

Meeting Program



235th ECS Meeting
May 26-30, 2019
Dallas, TX
Sheraton Dallas

*Advancing solid state &
electrochemical science and
technology since 1902*



WIFI NETWORK
Name: freethescience
Password: openaccess



ECS LEADERSHIP

ECS Officers

Yue Kuo, *President*
Christina Bock, *Sr. Vice President*
Stefan De Gendt, *2nd Vice President*
Eric Wachsmann, *3rd Vice President*
James Fenton, *Secretary*
Gessie Brisard, *Treasurer*
Chris Jannuzzi, *Executive Director/Chief Executive Officer*

Board of Directors

Christina Bock, *Sr. Vice President*
Stanko Brankovic, *Chair, Electrodeposition Division*
Mikhail Brik, *Chair, Luminescence & Display Materials Division*
Gessie Brisard, *Treasurer*
Vimal Chaitanya, *Chair, Dielectric Science & Technology Division*
Graham Cheek, *Chair, Organic & Biological Electrochemistry Division*
Stefan De Gendt, *2nd Vice President*
Marca Doeff, *Chair, Battery Division*
James Fenton, *Secretary*
Andy Herring, *Chair, Energy Technology Division*
Masayuki Itagaki, *Chair, Corrosion Division*
Christopher Jannuzzi, *Executive Director*
Greg Jackson, *Chair, High-Temperature, Energy, Materials & Processes Division*
Ajit Khosla, *Chair, Sensor Division*
Yue Kuo, *President*
Johna Leddy, *Past President*
Colm O'Dwyer, *Chair, Electronics & Photonics Division*
Slava Rotkin, *Chair, Nanocarbons Division*
John Staser, *Chair, Industrial Electrochemistry & Electrochemical Engineering Division*
Alice Suroviec, *Chair, Physical & Analytical Electrochemistry Division*
Stuart Swirson, *Nonprofit Financial Professional*
E. Jennings Taylor, *Chair, Interdisciplinary Science & Technology Subcommittee*
Eric Wachsmann, *3rd Vice President*

ECS Staff

Dinia Agrawala, *Graphic Designer/Print Production Manager*
Casey Annunziata, *Meetings Specialist*
Karen Chmielewski, *Finance Associate*
Paul Cooper, *Editorial Manager*
Beth Craanen, *Director of Publications*
Tim Gamberzky, *Chief Operating Officer*
Annie Goedkoop, *Associate Director of Publications/Interface Managing Editor*
Paul Grote, *Director of Finance*
Andrea Guenzel, *Publications Specialist*
Mary Hojlo, *Membership and Constituent Services Specialist*
Chris Jannuzzi, *Executive Director/Chief Executive Officer*
Bianca Kovalenko, *Meetings Program Specialist*
Ngoc Le, *Development Associate*
John Lewis, *Director of Meetings and Corporate Programs*
Winnie Mutch, *Web Manager*
Anna Olsen, *Senior Content Specialist/Library Liaison*
Jennifer Ortiz, *Web Content Specialist*
Shannon Reed, *Director of Community Engagement*
Andrew Ryan, *Publications Specialist*
Beth Schademann, *Publications Specialist*
Logan Streu, *Publications Content Manager*
Jessica Wisniewski, *Human Resources/Operations Manager*

Contact Information

The Electrochemical Society
65 South Main Street, Pennington, NJ, 08534-2839, USA
tel: 1.609.737.1902, fax: 1.609.737.2743

General Questions: ecs@electrochem.org
Publications: publications@electrochem.org
Meetings: meetings@electrochem.org
Sponsorships: sponsorship@electrochem.org
Membership: customerservice@electrochem.org
Development: development@electrochem.org
Awards: awards@electrochem.org

www.electrochem.org



All recycled paper. Printed in USA.

ECS Welcomes You to Dallas



Yue Kuo

Yue Kuo
ECS President

On behalf of the board of directors, volunteer leadership, and staff of ECS, it is my pleasure to welcome you to the 235th ECS Meeting.

ECS is proud to have the Sheraton Dallas as the headquarters hotel for the meeting. Located in the city's thriving Arts District, the hotel is just moments away from world-class shopping, restaurants, and entertainment. While you're here, enjoy easy access to downtown attractions including the American Airlines Center, Fair Park, and the Dallas Symphony.

In between the sightseeing, make the most of all the perks the meeting has to offer: network with colleagues, discuss important research, and discover new opportunities for collaboration!

To kick off this exciting week, join us for the **opening reception** on Sunday in Lone Star A3/A4 (SCC) at 1900h.

You won't want to miss the **plenary session** on Monday, May 27, in Lone Star A3/A4 (SCC), where we will welcome all attendees and wrap up the first full meeting day with the **ECS Lecture** "Guardian Angels Turning Sickcare into Healthcare" by Koen Kas. We will also recognize **Society award winners** Héctor Abruña, recipient of the Allen J. Bard Award in Electrochemical Science, and David Lockwood, recipient of the Gordon E. Moore Medal for Outstanding Achievement in Solid State Science & Technology. Be sure

to attend the many society, division, and section award talks in various symposia throughout the week. Check out the technical program for more details.

Of course, don't forget to visit the **exhibit hall** to learn more about our exciting lineup of industry-leading exhibitors and mingle with colleagues. The **poster sessions** on Monday, Tuesday, and Wednesday will feature hundreds of posters that you can browse at your leisure. You should also stop by the **ECS booth** to learn more about the society and **Free the Science**, an initiative that aims to make our research freely available to anyone, anywhere to advance our sciences and solve problems for humanity.

Finally, make sure to download the **ECS mobile app** on your Apple or Android device, where you'll be able to access the **ECS meeting scheduler**. If you have any questions, please do not hesitate to stop by the **registration area** at the Lone Star Preconvene of the Sheraton Convention Center for further assistance.

We thank you again for your continued support of ECS!

Program Guide

Author Index.....	198	Get to Know ECS.....	3
Awards, Division.....	22	Highlighted Events.....	12
Awards, Society.....	21	Information for Presenters.....	4
Committee and Board Meetings.....	17	Institutional Members.....	inside back cover
Companion Registrant Program.....	2	Local Area Map.....	6
Data Sciences Hack Week.....	15	Meeting Abstracts.....	3
Division Events.....	17	Meeting App.....	3
ECS Committees and Subcommittees.....	40	Message from the President.....	1
ECS Division Officers.....	37	Plenary Session.....	20
ECS Editorial Boards.....	36	Poster Session Information.....	12
ECS Officers and Staff.....	inside front cover	Professional Development Workshops.....	13
ECS Sections.....	37	Registration Information.....	2
ECS Student Chapters.....	38	Section Events.....	17
ECS Transactions (ECST) for Dallas.....	43	Sessions-at-a-Glance.....	58
Events-at-a-Glance.....	16	Short Courses.....	14
Exhibitors.....	26	Sponsors.....	32
Floor Plans.....	7-9	Symposium Sponsors.....	33
Future ECS Meetings.....	back cover	Symposium Topics.....	56
General Meeting Information.....	2	Technical Program.....	74

General Information

Registration

LOCATION: Lone Star Preconvene (SCC)

Saturday.....	1600-1900h
Sunday.....	0700-1900h
Monday.....	0700-1900h
Tuesday.....	0700-1730h
Wednesday.....	0700-1600h
Thursday.....	0700-1000h

Registration Fees*

On Site Registration Fees

Member	\$820
Nonmember.....	\$1,035
Student Member.....	\$480
Student Nonmember	\$540
One Day Member.....	\$655
One Day Nonmember	\$800
Emeritus & Honorary Member	\$0
Nontechnical Registrant.....	\$65

*All prices are in U.S. Dollars

Who must pay the registration fee?

All meeting participants, including invited speakers, are required to pay the appropriate registration fees. Individuals participating in short courses along with the meeting are required to register for both events.

Companion / Nontechnical Registrant Program

Travel companions of attendees are invited to register for the meeting as a nontechnical registrant. The nontechnical registrant fee of \$65 includes admission to non-ticketed social events and a “Welcome to Dallas” gift packet.

Lost Badge or Ticket

There will be a \$30 charge for reprinting lost badges or tickets. Admittance will not be granted to ticketed events without an actual ticket. Tickets must be reprinted at registration during scheduled hours and cannot be reprinted at the event itself.

Short Course Registration

Three short courses are being offered on Sunday, May 26th from 0900h to 1630h. Pre-registration for short courses is required—the deadline was May 20, 2019; however, if you are interested in registering for a short course please stop by registration to see if space is available.

Short Course Registration Fees*

	Course Only Regular Fees	Course Regular Fees (Price discounted with the purchase of a meeting registration)
Member	\$625	\$500
Nonmember.....	\$775	\$650
Student Member.....	\$325	\$250
Student Nonmember	\$400	\$325

*All prices are in U.S. Dollars.

Things to Know

Wifi

Complimentary network in the meeting space for all attendees.

Username: freethescience

Password: openaccess

ADA Accessibility

Special accommodations for those attendees living with a disability will be handled on an individual basis. Contact the meeting headquarters today if you will need assistance by emailing meetings@electrochem.org or stop by registration on site.

Permissions Granted to ECS

ECS reserves the right to electronically record any or all meeting-related events. By registering for and/or attending an ECS meeting you are granting ECS permission to use any recording or photography made of you at any meeting event or anywhere within the meeting venue.

Speaker Indemnification

The ideas and opinions expressed in the technical sessions, conferences, and any handout materials provided are those of the presenter. They are not those of ECS, nor can any endorsement by ECS be claimed.

Photography and Recording Is NOT Permitted in Technical Sessions



By attending the ECS meeting, you agree that you will not record any technical session activity, without the express written consent of ECS. If you violate this policy you will be removed from the meeting and your registration will be revoked without the possibility of a refund.

Financial Assistance

Financial assistance is limited and generally governed by the symposium organizers. Contact your symposium organizers to see if funding is available. Individuals requiring an official letter of invitation should write to the meeting headquarters office; such letters will not imply any financial responsibilities of ECS.

Letters of Attendance

Individuals requiring an official letter of attendance should visit the “Letters of Attendance” self-help computer in the registration area or see a meeting representative.

Need an Invoice?

Your registration information and invoice are available to you 24 hours a day, 7 days a week from your own computer.

Go to www.electrochem.org to log into your account to access this information today.



Abbreviation Key

SH = Sheraton Hotel

SHS = Sheraton Hotel South Tower

SCC = Sheraton Convention Center

Make the Most of Your ECS Experience

Meeting App

Download the ECS app, by searching “ECS mobile” in your app store, to put the technical program and personal meeting scheduler on your mobile device. Browse, add, and sync sessions, events, and presentations to create your own custom itinerary! Connect with ECS all year and stay informed with the latest news in the world of electrochemistry and solid state science. The online program can also be found on the 235th ECS Meeting homepage.

Tools for a Successful Meeting Experience

- Access all of the meeting abstracts online at <https://www.electrochem.org/235>
- Become familiar with the meeting layout by using the maps on pages 7-9.
- Turn off cell phones during presentations and remember photography and recording in the session rooms is prohibited.
- Become a Member! Stop by customer service, in the registration area, for more information.
- Visit the exhibit hall to network and learn more about the latest innovations in the industry.
- Tell us about your experience by completing the post conference survey that will be sent via email.

Advance your career in Dallas

- Attend a Professional Development Workshop, more information on page 13.
- Visit the ECS Career Expo on the exhibit floor for the opportunity to meet top employers and discuss career opportunities.
- Attend the Annual Society Business Meeting and Luncheon to learn more about the business behind the science, more information on page 12.
- Visit the exhibit hall to talk with groundbreaking companies in the field and network with poster presenters. Start researching which booths you will stop by on page 26.
- Check out the newly launched ECS Career Center, available all year round, at jobs.electrochem.org.
- Update your LinkedIn with a new photo! Receive a complimentary professional portrait at the career expo, Booth EX100.

Meeting Abstracts

Always right at hand—and as always, **FREE!** Registrants may easily access all abstracts via the meeting scheduler or may download them from the meeting website. Paper editions of meeting abstracts are not distributed; attendees who require paper should download abstracts and print them in advance of the meeting.

Get to Know ECS

The ECS Exhibit Booth

Stop by the ECS booth on the exhibit floor to engage with ECS staff and discover more about the programs and services available to you. Representatives from publications, membership, meetings, and development will be available at various times to answer your questions.

Learn more about:

- Subscribing to the ECS Digital Library
- Upcoming ECS biannual and sponsored meetings
- Individual and institutional membership at ECS
- How to publish with ECS and why publish open access
- Exhibit, sponsorship and advertising opportunities
- *Free the Science*
- Awards, educational programs and much more!

Participate in other booth activities:

- Enter to win the following raffles:
 - Monographs (*Electrochemical Impedance Spectroscopy*, second edition and *Atmospheric Corrosion*, second edition)
 - Free Meeting Registration for the 236th ECS Meeting in Atlanta, GA
 - Free Meeting Registration for the ECEE 2019 Meeting in Glasgow, Scotland
 - Free 5-Year Membership
- Pick up ECS giveaways
- Make a donation to *Free the Science*

Conference Proceedings

Proceedings papers from select symposia have been published online in *ECS Transactions*. All 235th ECS Meeting issues are available to browse and read on an article-level in the ECS Digital Library, www.ecsdl.org, and may also be purchased in full as an instant PDF download from the ECS Online Store.

Publish with ECS Following Your Presentation

ECS has several excellent publication venues, and accepts research in a variety of formats. Consider submitting a preprint of your full-text manuscript, poster, or presentation slides, to ECS’s preprint service, ECSarXiv. Submit today at www.electrochem.org/ecsarxiv.

ECS’s peer-reviewed journals, *Journal of The Electrochemical Society* and the *ECS Journal of Solid State Science and Technology*, provide continuous publication while maintaining the highest standards of peer review. Both journals offer the option of publishing open access (OA) through ECS’s Author Choice Open Access program. This program has various discount options, allowing most authors to publish OA for FREE through ECS membership or through the ECS Plus subscription program! To learn more, visit www.electrochem.org/oa or contact oa@electrochem.org.



Join your community. Develop your potential. Advance your career.

Ask any ECS member why they joined ECS. Their response likely will be: “My advisor was a member of the Society and encouraged me to join,” or “ECS members receive great discounts on biannual meeting registrations.”

Next, ask them why they have remained an ECS member. Nearly all members will attest that, after joining the Society, ECS quickly became their family, connected them to a job opportunity, or helped advance their professional career.

ECS members receive great benefits—both in discounts and in professional development. Visit www.electrochem.org/join to join today or stop by customer service in the registration area.

Free the Science

Free the Science is ECS’s initiative to move toward a future that embraces open science to further advance research in our fields. This is a long-term vision for transformative change in the traditional models of communicating scholarly research. ECS believes that openness democratizes access to the scientific process; to that end, ECS is committed to playing a crucial role in implementing the necessary changes. More openness in our sciences means faster progress and solutions to global challenges in human health and the sustainability of the planet. Support *Free the Science* by submitting your poster or slide presentation to ECSarXiv, publishing open access in an ECS journal, or stopping by the ECS exhibit booth to learn more.



Information for Presenters

Commercial advertisements or publicity will *NOT be permitted* during oral or poster presentations.

For further detailed information on oral and poster presentation requirements, please visit the Author & Presenter Info page on the 235th ECS Meeting website.

Oral presentations must be in English. Laptop computers and projectors will be available in each symposium room for presentations, and presenting authors **MUST** have their presentation on a USB flash drive to be used with the dedicated laptop. Speakers requiring special equipment must have submitted a written request to ECS headquarters (meetings@electrochem.org) prior to the meeting; no special requests will be handled onsite. Additional information for oral presentations are as follows:

- Arrive to your session room early and introduce yourself to the session chairs (they will have a blue chair ribbon on their nametag).
- No additional time is given for Q&A. If you plan to have Q&A, be sure to prepare your talk accordingly, based on the duration you were given in your acceptance notification.
- There is no speaker ready room.

Poster presentations must be in English, and correspond to the abstract number and assigned date of presentation, as detailed in your acceptance notification. Additional information for the poster sessions are as follows:

- No posters will be displayed without author participation, no exceptions will be granted.
- You must remove your poster at the end of each session. Any posters left will be discarded.
- Posters may be mounted from 1400-1700h on Monday, Tuesday, and Wednesday. **You may only mount your poster on the day of your presentation.**
- Pushpins and/or thumbtacks will be supplied.
- There will be two posters per board, so allow equal space for the second poster on your board.
- Authors are responsible for the security of their displays and all items of value; ECS will not assume any responsibility for lost, stolen, or broken articles.

The Z01 General Student Poster Session will be held as a part of the Tuesday General Poster Session and Technical Exhibit. Students may set up their presentations from 1400-1700h; judging of the posters will begin at 1700h and formal presentations will begin at 1800h. Winners will be announced and awards will be presented during the Wednesday General Poster Session from approximately 1815-1830h.

You may mount your poster *only* on your assigned day.

Monday 1400-1700h

Tuesday 1400-1700h

Wednesday 1400-1700h

Go Green

Did you know that almost
11,000 lbs (4,989.5 kgs)
of paper is used to create the meeting program?

Each program is comprised of about 250 pages of content which creates a coveted token of the meeting but also generates a lot of waste at the end of the week.

Help ECS with our goal to live our mission and reduce our impact on the environment by accessing the meeting program online! Between the online version, which is available in advance of the printed copy on the meeting homepage, and the meeting app, all of the same information is available at your fingertips with little to no environmental consequences!



Shaping the Future

Applied Materials is the leader in materials engineering solutions used to produce virtually every new chip and advanced display in the world. Our expertise in modifying materials at atomic levels and on an industrial scale enables customers to transform possibilities into reality. At Applied Materials, our innovations make possible™ the technology shaping the future.

Learn more: www.appliedmaterials.com

APPLIED MATERIALS
make possible

The best answers come out
of the blue...



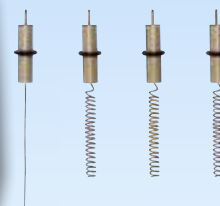
Battery Testers



High Current Boosters



Potentiostats



Accessories



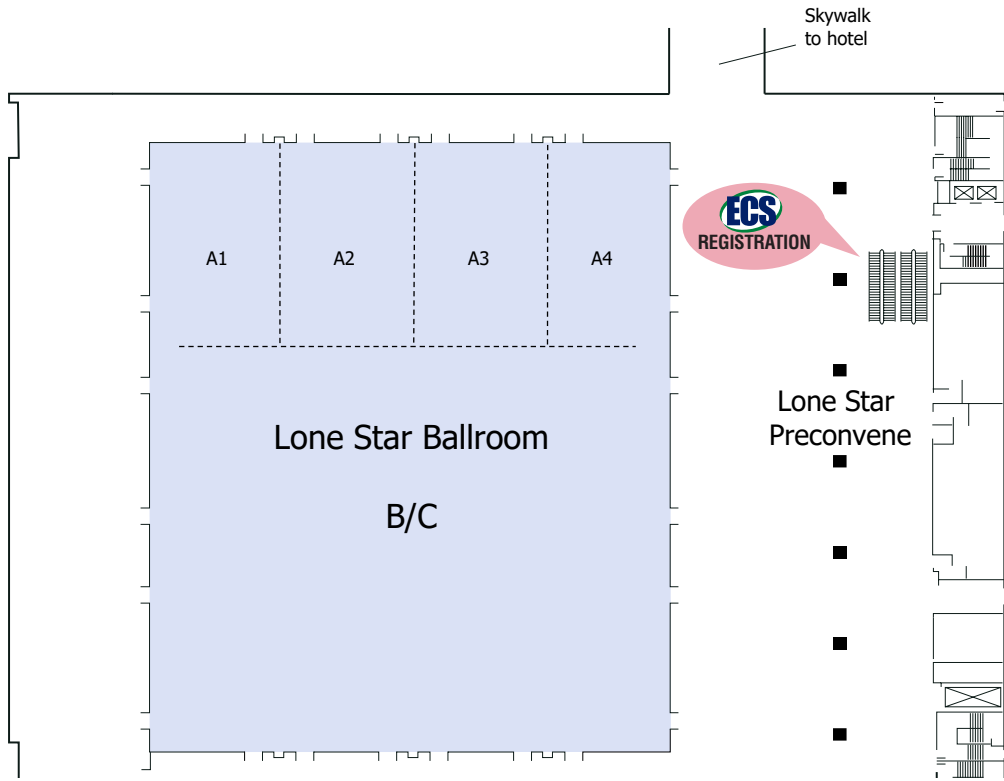
Full range of E-Chem products available at:
www.bio-logic.net

Local Area Map

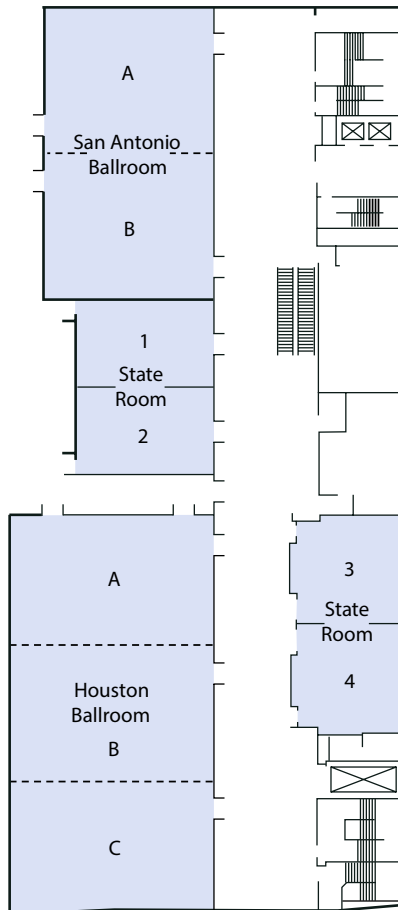


Floor Plans

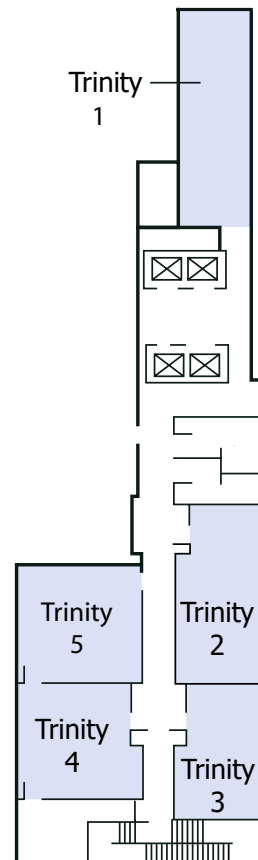
Sheraton Conference Center 2nd Floor



Sheraton Conference Center 3rd Floor

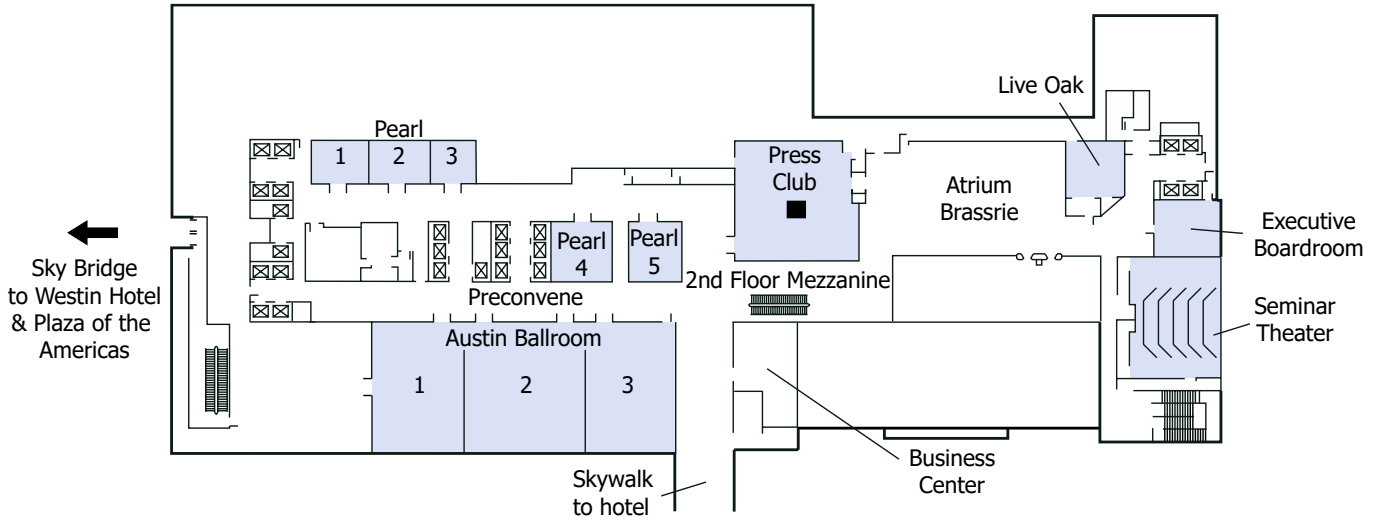


Sheraton Hotel South Tower 3rd Floor

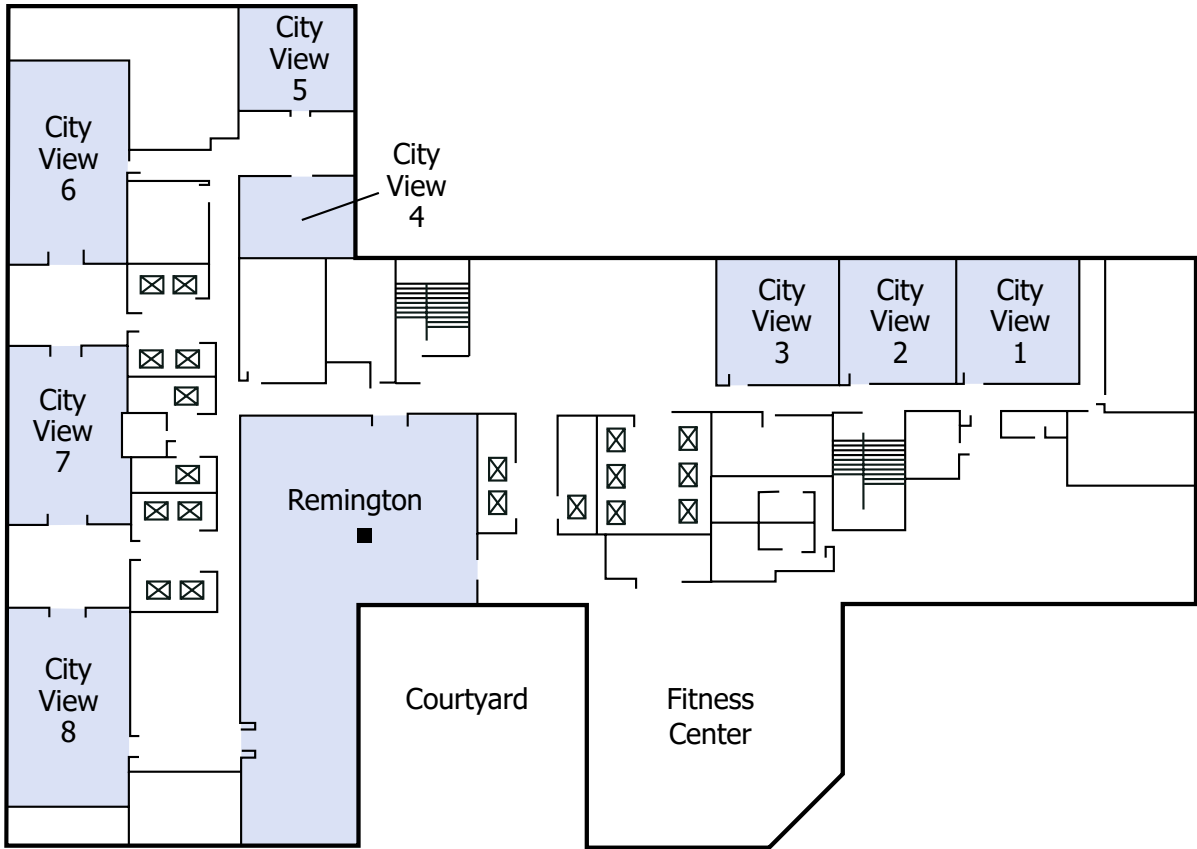


Floor Plans

Sheraton Hotel 2nd Floor

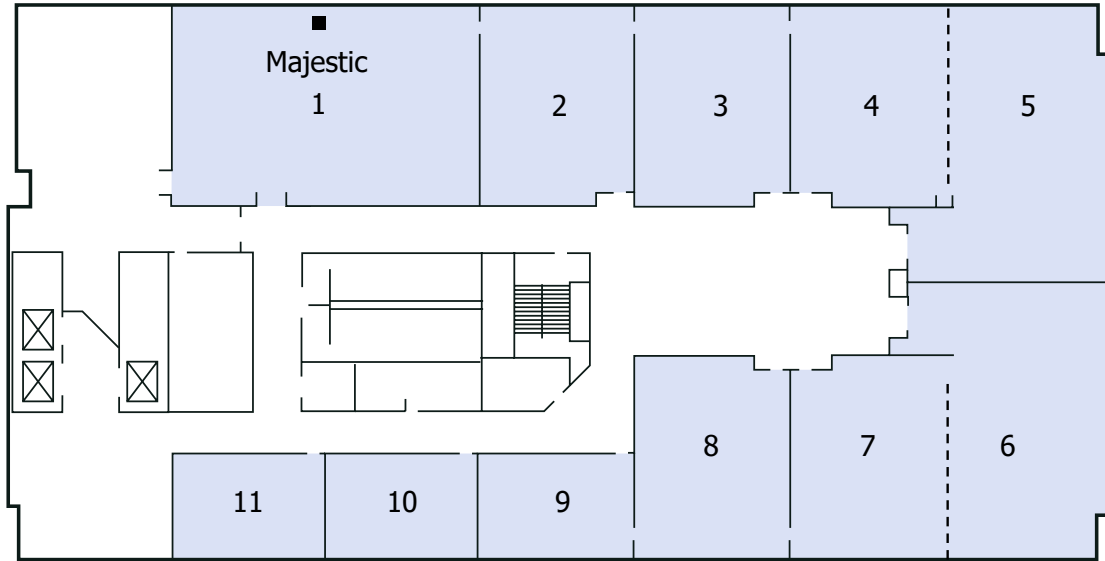


Sheraton Hotel 4th Floor

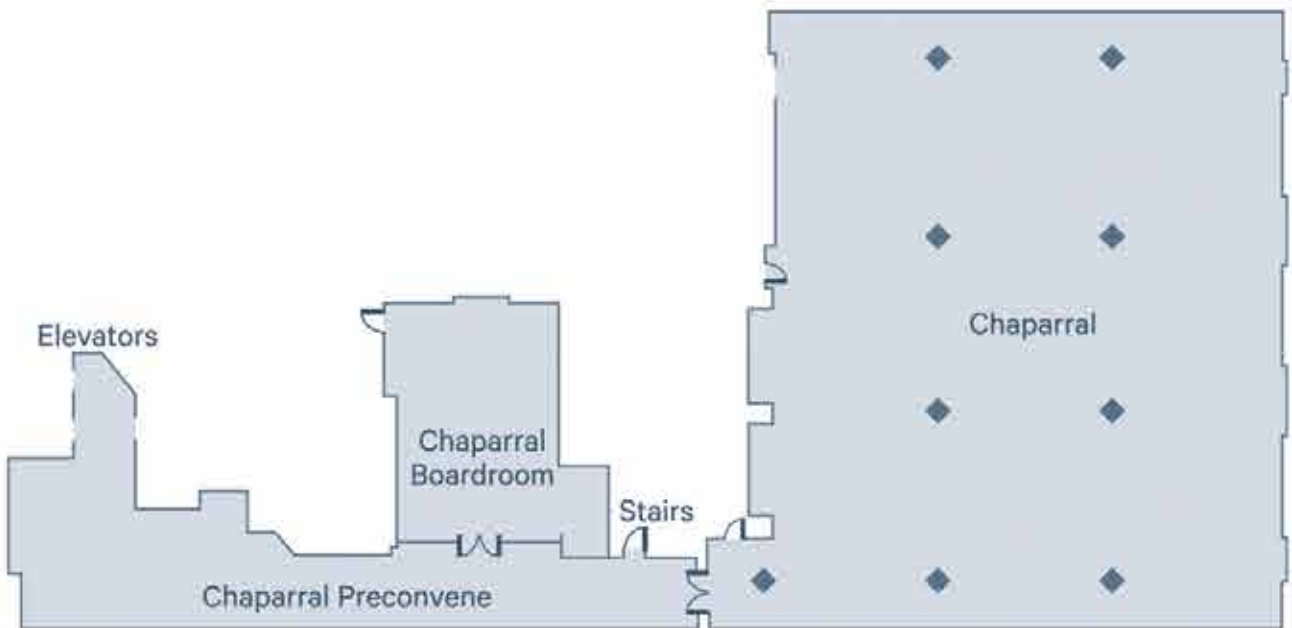


Floor Plans

Sheraton Hotel 37th Floor



Sheraton Hotel 38th Floor



235th ECS MEETING BY THE NUMBERS



60

countries
represented

2,271
abstracts

47
symposia



1,839
oral talks

42
award &
keynote talks



561
invited
talks

72
early career
abstracts

(10 years or less since BS degree)



597
student
talks

432
posters



269
student
posters

TAKE CONTROL

Booth 302

**600 Electrolyzer
Test System**

scribner

www.scribner.com

Highlighted Events

Opening Reception

Lone Star A3/A4 (SCC)

Sunday.....1900-2100h

Come get a taste for Dallas and help kick-off an exciting week! All attendees are welcome to attend for light snacks, an open bar, and ample time to network.

Session Chair and Symposium Organizer Breakfast

Austin Ballroom 3 (SH)

Monday.....0700-0800h

The success of the meeting is very much due to the hard work of the session chairs, symposium organizers, and division members. All are encouraged to attend this orientation to ensure they are best prepared for their roles in the meeting, and to learn helpful information about future meetings.

Technical Exhibition

Lone Star B/C (SCC)

Monday.....1800-2000h

Tuesday and Wednesday1400-2000h

Take time to explore exhibits from the leading vendors in the electrochemical and solid state science fields. Make sure to also stop by the exhibit hall for Poster Sessions and the Networking Breaks. View the exhibitor listing on page 26.

Student and General Poster Sessions

Lone Star B/C (SCC)

Monday, Tuesday and Wednesday.....1800-2000h

With hundreds of posters to explore, you won't want to miss a single minute of these sessions. Grab a snack, wander the aisles, review the presentations, talk to the authors, share some laughs... these sessions are a great way to end the day!

ECS Career Expo

Monday.....1800-2000h

Tuesday and Wednesday1400-2000h

The career expo serves as a premier opportunity for employers and recruiters to meet and interview job-seekers, volunteers, and post-doctoral candidates. Along with the career expo, ECS will be offering several professional development workshops (see page 13) to assist job-seekers with their employment search.

Student Mixer

Chaparral Main Room (SH)

Monday.....2000-2200h

The mixer is a must attend event for students! Enjoy networking with your peers and early career professionals while light food and refreshments are served. Purchase your tickets online or visit customer service located in the registration area.

Member.....\$5.00

Nonmember.....\$15.00

Networking Breaks

Lone Star B/C (SCC)

Monday through Thursday.....0930-1000h

Monday through Wednesday1530-1600h

Take a moment to stretch your legs, reenergize with coffee or tea and network with fellow attendees and exhibitors before your next session.

Annual Society Business Meeting and Luncheon

Majestic 1 (SH)

Tuesday.....1200-1400h

Join us as we celebrate the many successes of 2018 and look forward to an even brighter future!

This luncheon will feature a special presentation, "Perspectives on the State of Science and Technology: Innovation and the Workforce of the Future," by Dr. Carol A. Bessel, Acting Division Director of the National Science Foundation Division of Chemistry.

ECS Fellow.....\$45.00

Member.....\$55.00

Nonmember.....\$65.00

Professional Portraits

Lone Star B/C, Booth EX100 (SCC)

Tuesday and Wednesday1700-2000h

Update your LinkedIn with a new photo! Meeting attendees can take the opportunity to receive a complimentary professional portrait at the ECS Career Expo. *No appointment necessary.*

ECS Data Science Hack Week

Remington (SH)

Sunday - Wednesday

ECS Data Science Hack Week is part of the Society's continuing work toward building an electrochemical data science and open source community from the ground up. All electrochemical engineers, whether experimentally or theoretically focused, can benefit from this workshop program by learning how to create, share, use, and improve open source software tools and public datasets to accelerate research progress in our field. See page 15 for more information.

**Please note pre-registration was required for this program.*

Annual Society Business Meeting and Luncheon

235th ECS Meeting in Dallas Tuesday, May 28

This luncheon will feature a special presentation, "Perspectives on the State of Science and Technology: Innovation and the Workforce of the Future," by Dr. Carol A. Bessel, Acting Division Director of the National Science Foundation Division of Chemistry.

Onsite

Fellow	\$45
Member	\$55
Nonmember	\$65

Purchase tickets when you register:

www.electrochem.org/235

Professional Development Workshops

Managing and Leading Teams

Majestic 3 (SH)

Instructor: Dennis Hess, Georgia Institute of Technology

Monday 1000-1200h

Nearly all engineers and scientists work in teams where a leader oversees and guides process/product development and direction. When technically-trained individuals undertake a leadership role, frustration is a frequent outcome, despite technical competency and good intentions. This workshop will discuss reasons why engineers and scientists often find adaptation into leadership roles disconcerting and will explore ways to smooth the transition. *This is a two-hour workshop.*

Member \$15.00
 Nonmember \$20.00
 Student Member \$5.00
 Student Nonmember \$10.00

Win Funding: How to Write a Competitive Proposal

Majestic 3 (SH)

Instructor: Michel Foure, Berkeley Grant Writing

Monday 1400-1600h

Whether your career takes you to Industry, Academia or a National Lab, chances are that you will be intimately involved in writing research grant proposals. In fact, your career growth may largely hinge on your ability to raise funding. While each proposal is unique, lying at the intersection of the funding agency needs and your technical idea, there are very important guidelines that must be observed in order to maximize the probability of success. As this workshop is interactive, it would be particularly meaningful and useful for the participants to be prepared to work with a real example. This could be a proposal they have submitted in the past or one they anticipate to submit. *This is a two-hour workshop.*

Member \$15.00
 Nonmember \$20.00
 Student Member \$5.00
 Student Nonmember \$10.00

Essential Elements for Employment Success

Majestic 3 (SH)

Instructor: Michel Foure, Berkeley Grant Writing

Tuesday 0900-1200h

Landing your next job requires selective and effective networking, developing and submitting specifically targeted resumes and cover letters, locating relevant job opportunities and preparing for and participating in the job interview. This workshop will provide up-to-date information and tips for employment success. *This is a three-hour workshop.*

**This workshop also includes the Resume Review*

Member \$15.00
 Nonmember \$20.00
 Student Member \$5.00
 Student Nonmember \$10.00

Resume Review

Lone Star B/C, Booth EX102 (SCC)

Instructors: Michel Foure, Berkeley Grant Writing

Tuesday & Wednesday 1400-1800h

Bring your resume for a one-on-one session with an industry leader and expert on resume development. You will walk away with a resume that is sure to land you your next interview. To sign-up for a resume review appointment, you must first attend the Essential Elements for Employment Success; registration for a resume review occurs during the Essential Elements for Employment Success workshop. Appointments are 20-minutes in length.

**You must register for Essential Elements for Employment Success in order to participate.*

Managing Conflict

Majestic 3 (SH)

Instructor: Dennis Hess, Georgia Institute of Technology

Tuesday 1400-1500h

When more than one person is in a meeting, disagreement on the interpretation of results, conclusions, implementation, and subsequent directions is the likely outcome, which leads to conflict. An effective leader has learned how to manage conflict and use it to improve team performance. This workshop will discuss conflict sources and explore ways to minimize the disruption that often results. *This is a one-hour workshop.*

Member \$15.00
 Nonmember \$20.00
 Student Member \$5.00
 Student Nonmember \$10.00

Patent Law for Scientists and Engineers (new)

Majestic 3 (SH)

Instructors: E. Jennings Taylor and Maria Inman, Faraday Technology, Inc.

Wednesday 1400-1700h

An interactive workshop that provides an introduction to U.S. patent law and is directed towards researchers from academia, industry, and government entities. The workshop offers a historical basis for the foundation of U.S. patent law in the U.S. constitution. Learn the statutory definitions of an invention and distinguish between an inventor on a patent and an author on a publication. In addition, the workshop will cover the classes of patentable inventions and the requirements for obtaining a patent on an invention. This is a three-hour workshop.

Member \$55.00
 Nonmember \$95.00
 Student Member \$30.00
 Student Nonmember \$45.00

Short Courses

ECS short courses are all-day classes designed to provide students or the seasoned professional with an in-depth education on a wide range of topics. Taught by academic and industry experts, the small class size makes for an excellent opportunity for personalized instruction helping both novices and experts advance their technical expertise and knowledge. Short courses are open to the public with special discounts given to meeting attendees.

Short course registration also includes:

Breakfast

Location: individual session rooms, see short course locations

0800-0900h

Morning Coffee Break

Location: individual session rooms, see short course locations

0945-1015h

Lunch

Location: Austin Ballroom 1 (SH)

1200-1330h

Afternoon Coffee Break

Location: individual session rooms, see short course locations

1500-1530h

Battery Safety and Failure Modes

Trinity 4 (SHS)

Instructors: Thomas Barrera and Boryann Liaw

The severity of an energetic lithium-ion battery (LIB) safety incident has the potential to make high specific energy LIB chemistries an at-risk technology for some applications. As such, improvements in LIB safety design without compromising performance continues to be a major focus for researchers, manufacturers and users across all sectors of the energy storage marketplace.

This new short course provides a foundation for understanding the general principles of LIB safety and failure modes analysis. The effects of LIB chemical, electrical, thermal, and mechanical design features on safety characteristics will be presented. The course is also focused on how to use electrochemical characterizations, primarily incremental capacity based approach, to identify and quantify failure modes and effects. The principles of such analysis will be explained, examples given, and effects quantified. A systematic approach with other physical and chemical analyses will be introduced to illustrate how a holistic failure modes and effects analysis can be used to aid LIB cell design and assessment.

The course is designed to benefit R&D scientists, practicing engineers, and students who have a need to increase their knowledge to design, test and operate safe LIB energy storage systems.

Fundamentals of Corrosion

Trinity 3 (SHS)

Instructor: Luis F. Garfias

This course covers the basics of corrosion science and corrosion engineering. It is targeted towards people with no knowledge of corrosion, but with a physical sciences or engineering background. By the end of this course each student will learn: a) basic concepts of corrosion, b) learn to select appropriate materials for their particular materials/environment, and c) know which will be the common and easiest techniques and methodologies to test and qualify materials (resistant to corrosion).

The course will begin with a general, basic foundation of electrochemistry and corrosion. It will cover the terminology and definitions commonly used in corrosion, as well as the different types of passivity and corrosion. The course will cover typical engineering materials (mostly metals, but we will briefly talk about non-metals, and composites) and their interaction with their environment (temperature, pressure, gases, liquids, chemicals, soils, etc.). We will also learn some of the common methodologies to prevent and control materials degradation (for example: materials selection, adding inhibitors, applying a protective coating, using cathodic or anodic protection, etc.).

Basic knowledge of corrosion monitoring and inspection, as well as field and laboratory testing will be covered. Failure Analysis and case studies will be discussed throughout the different sessions (see below outline).

The course has a practical component where the students will learn (“hands-on”) the basics of sample preparation, polishing, etching, metallography, microscopy, and basic corrosion testing. The students are invited to bring their own samples just in case we have sufficient time to run basic testing on them.

Course outline

- Introduction to Corrosion
- Types of Corrosion
- Interactions of Materials and their Environment
- Corrosion Prevention
- Corrosion Monitoring and Inspection
- Basic Corrosion Testing
- Advanced Corrosion Testing (electrochemistry and microscopy)
- Case studies and lessons learned from failure analysis and corrosion projects

Fundamentals of Electrochemistry: Basic Theory and Thermodynamic Methods

Trinity 5 (SHS)

Instructor: James Noël

This course covers the basic theory and application of electrochemical science. It is targeted toward people with a physical sciences or engineering background who have not been trained as electrochemists, but who want to add electrochemical methods to their repertoire of research approaches. There are many fields in which researchers originally approach their work from another discipline but then discover that it would be advantageous to understand and use some electrochemical methods to complement the work that they are doing.

The course begins with a general, basic foundation of electrochemistry and uses it to develop the theory and experimental approaches to electrochemical problems of a thermodynamic nature. It complements a sister course, “Fundamentals of Electrochemistry: Basic Theory and Kinetic Methods”, offered alternately by the same instructor. The two courses have different emphasis, and each is designed to be a stand-alone introduction to electrochemical fundamentals. If both courses are desired, they can be taken in either order.

Course outline

- Introduction and Overview of Electrode Processes
- Chemical vs. Electrochemical Thermodynamics
 - reference electrodes, standard potentials, cell potentials, Nernst equation, electrode-solution interface, and double-layer structure
 - ion-selective electrodes, applications in analytical electrochemistry and sensors, aqueous and non-aqueous systems
- Chemical Stoichiometry vs. Faraday’s Law
 - coulometry, bulk electrolysis

- Theoretical Basis for Methods
 - surface tension, adsorption and adsorption isotherms, electrocapillarity, potential of zero charge, Lippmann equation
- Methodology
 - potentiometry, differential capacity, coulometry, cyclic voltammetry, polarography
- Electrochemical Instrumentation
 - voltmeters, ammeters, potentiostats, galvanostats, design of electrochemical cells
- Coupled Characterization Methods (time permitting)
 - modified electrodes, spectroelectrochemistry, in-situ neutron scattering, surface analysis, etc.



ECS Data Science Hack Week May 26-29 *Remington (SH)*

Building on the success of ECS Data Science Hack Day (October 2017), ECS Data Science Hack Week (May 2018), and the ECS Data Science Showcase (October 2018), we are pleased to offer another exciting data science opportunity at the spring meeting in Dallas. In May 2019, the program will return to an entire week as the next stage in ECS supporting a growing electrochemical data science and open source community. The goal of these events is to bring together people from different backgrounds to collaborate in order to increase awareness and impact of data science tools, open source software, and shared datasets in electrochemistry and solid state science and technology.

Hack Week will again be led by the very capable and engaging team from University of Washington: Dan Schwartz, David Beck, and Matt Murbach. The program will kick off with optional software training tutorials on Sunday, and then sessions all day Monday through Wednesday.

Meet the Organizers



DANIEL SCHWARTZ



DAVID BECK



MATTHEW MURBACH

Daniel Schwartz is the Boeing-Sutter Professor of Chemical Engineering and Director of the Clean Energy Institute at the University of Washington, and brings electrochemistry and modeling expertise to the team.

David Beck is Director of Research with the eSciences Institute at the University of Washington and faculty in Chemical Engineer, and leads regular hackathons; he is Associate Director of the NSF Data Intensive Research Enabling CleanTech (DIRECT) PhD training program.

Matthew Murbach is past-president of the University of Washington ECS Student Chapter, and an advanced data sciences PhD trainee; he has been leading the student section software development sessions on the UW campus, and has practical experience coaching electrochemical scientists and engineers in software development.

Schedule

Sunday, May 26

- 0900-1200h.....(Optional Segment) Introduction to Data Science Tools #1 (using the shell/terminal, version control)
- 1300-1600h.....(Optional Segment) Introduction to Data Science Tools #2 (introduction to Python using Conda and Jupyter)
- 1930-2030h.....Hack Week Kickoff Event

Monday, May 27

- 0830-1200h.....Intermediate Python Topics
- 1200-1330h.....Lunch Break
- 1330-1430h.....Project Ideation and Team Formation
- 1430-1800h.....Project Hacking Time

Tuesday, May 28

- 0830-1200h.....Advanced Topics (e.g. cloud computing, machine learning, data visualization)
- 1200-1330h.....Lunch Break
- 1330-1800h.....Project Hacking Time

Wednesday, May 29

- 0830-1200h.....Project Hacking Time
- 1200-1330h.....Lunch Break
- 1330-1630h.....Project Hacking Time
- 1700-1900h.....Project Presentations and Wrap Up

Featured Events

Events-at-a-Glance

Sunday, May 26

- 0700-1900h Meeting Registration is open,
Lone Star Preconvene (SCC)
- 0800-0900h Short Course Breakfast*, *Individual Session Rooms, see page 14 for locations*
- 0800h..... Technical Sessions begin (*check technical program on page 74 for details*)
- 0900-1630h Short Courses*, *see page 14 for locations*
- 1900-2100h Opening Reception, *Lone Star A3/A4 (SCC)*

Monday, May 27

- 0700-1900h Meeting Registration is open,
Lone Star Preconvene (SCC)
- 0700-0800h Session Chair and Symposium Organizer Orientation Breakfast, *Austin Ballroom 3 (SH)*
- 0800h..... Technical Sessions begin (*check technical program on page 82 for details*)
- 0930-1000h Coffee and Networking Break,
Lone Star Preconvene (SCC) and 2nd Floor Mezzanine (SH)
- 1000-1200h Managing and Leading Teams*, *Majestic 3 (SH)*
- 1400-1600h Win Funding: How to Write a Competitive Proposal*, *Majestic 3 (SH)*
- 1400-1700h Poster Set-up Period - Monday Evening Posters,
Lone Star B/C (SCC)
- 1530-1600h Coffee and Networking Break,
Lone Star B/C (SCC)
- 1700-1800h Plenary Session, *Lone Star A3/A4 (SCC)*
- 1800-2000h Technical Exhibit, ECS Career Expo, General Poster Session, *Lone Star B/C (SCC)*
- 1830-2200h I06 Symposium Reception in Honor of Shimshon Gottesfeld, *Majestic 6 (SH)*
- 2000-2200h Student Mixer*, *Chaparral Main Room (SH)*

Tuesday, May 28

- 0700-1730h Meeting Registration is open,
Lone Star Preconvene (SCC)
- 0800h..... Technical Sessions begin (*check technical program on page 109 for details*)
- 0900-1200h Essential Elements for Employment Success*,
Majestic 3 (SH)
- 0930-1000h Coffee and Networking Break,
Lone Star Preconvene (SCC) and 2nd Floor Mezzanine (SH)
- 1200-1400h Annual Society Business Meeting and Luncheon*, *Majestic 1 (SH)*
- 1400-1500h Managing Conflict*, *Majestic 3 (SH)*
- 1400-2000h Come visit our Exhibitors!,
Lone Star B/C (SCC)

- 1400-2000h ECS Career Expo, *Lone Star B/C (SCC)*
- 1400-1700h Poster Set-up Period - Tuesday Evening Posters,
Lone Star B/C (SCC)
- 1400-1800h Resume Review (appointment required),
Lone Star B/C, Booth EX102 (SCC)
- 1530-1600h Coffee and Networking Break,
Lone Star B/C (SCC)
- 1700-2000h Professional Portraits, *Lone Star B/C, Booth EX100 (SCC)*
- 1800-2000h General & Student Poster Session,
Lone Star B/C (SCC)
- 1830-2000h Symposium I05 Reception, *Majestic 5 (SH)*

Wednesday, May 29

- 0700-1600h Meeting Registration is open,
Lone Star Preconvene (SCC)
- 0800h..... Technical Sessions begin (*check technical program on page 149 for details*)
- 0930-1000h Coffee and Networking Break,
Lone Star Preconvene (SCC) and 2nd Floor Mezzanine (SH)
- 1400-2000h Come visit our Exhibitors!,
Lone Star B/C (SCC)
- 1400-2000h ECS Career Expo, *Lone Star B/C (SCC)*
- 1400-1700h Poster Set-up Period - Wednesday Evening Posters, *Lone Star B/C (SCC)*
- 1400-1700h Patent Law for Scientists and Engineers*,
Majestic 3 (SH)
- 1400-1800h Resume Review (appointment required),
Lone Star B/C, Booth EX102 (SCC)
- 1530-1600h Coffee and Networking Break,
Lone Star B/C (SCC)
- 1700-2000h Professional Portraits, *Lone Star B/C, Booth EX100 (SCC)*
- 1800-2000h M02 Symposium Reception, *Majestic 2 (SH)*
- 1800-2000h General Poster Session, *Lone Star B/C (SCC)*
- 1815-1830h Z01 Student Poster Award Winner Presentation,
Lone Star B/C (SCC)

Thursday, May 30

- 0700-1000h Meeting Registration is open,
Lone Star Preconvene (SCC)
- 0800h..... Technical Sessions begin (*check technical program on page 183 for details*)
- 0930-1000h Coffee and Networking Break,
Lone Star Preconvene (SCC) and 2nd Floor Mezzanine (SH)

**ticketed required: tickets may be purchased in advance or by stopping by customer service.*

Division Events

Sunday, May 26

- 1600-1700h Electronics and Photonics Division Symposium Planning, *Majestic 5 (SH)*
- 1700-2000h Dielectric Science and Technology Division Governing Body / Long Range Planning Committee and Symposium Planning, *Majestic 8 (SH)*
- 1800-2100h Physical and Analytical Electrochemistry Division Symposium Planning Committee, *Majestic 10 (SH)*
- 1800-2045h Sensor Division Executive Committee, *Majestic 2 (SH)*
- 1900-2000h Electronics and Photonics Division Award and General Business Meeting, *Majestic 3 (SH)*
- 1900-2100h Industrial Electrochemistry and Electrochemical Engineering Division Symposium Planning Committee, *Majestic 11 (SH)*
- 2000-2200h Electronics and Photonics Division Executive Committee, *Majestic 5 (SH)*

Monday, May 27

- 0700-0900h High-Temperature Energy, Materials, & Processes Division Executive Committee, *Majestic 9 (SH)*
- 0700-0900h Industrial Electrochemistry and Electrochemical Engineering Division Executive Committee, *Majestic 2 (SH)*
- 0700-0900h Physical and Analytical Electrochemistry Division Executive Committee, *Majestic 10 (SH)*
- 1215-1400h Industrial Electrochemistry and Electrochemical Engineering Division Business Meeting and Luncheon*, *Majestic 8 (SH)*
- 1800-2000h Organic and Biological Electrochemistry Division Executive Committee, *Majestic 9 (SH)*
- 1800-2000h Nanocarbons Division Executive Committee, *Majestic 2 (SH)*
- 1830-2030h Physical and Analytical Electrochemistry Division Business Meeting and Grahame Award Reception*, *Trinity 4 (SHS)*
- 1900-2100h Energy Technology Division Executive Committee Meeting, *Majestic 5 (SH)*

Wednesday, May 29

- 1215-1400h Energy Technology Division Business Meeting and Award Luncheon*, *Majestic 8 (SH)*
- 1215-1400h Organic and Biological Electrochemistry Division Business Meeting and Luncheon*, *Majestic 7 (SH)*
- 1930-2130h Nanocarbons Division Reception*, *Majestic 5 (SH)*

*ticketed required: tickets may be purchased in advance or by stopping by customer service.

Section Events

Monday, May 27

- 1800-1900h Europe Section Executive Committee, *Majestic 10 (SH)*
- 1900-2000h Europe Section Meeting, *Majestic 4 (SH)*

Tuesday, May 28

- 0700-1000h Texas Section Breakfast, *Majestic 9 (SH)*

Committee and Board Meetings

Sunday, May 26

- 1600-1730h Interface Advisory Board, *Majestic 7 (SH)*
- 1600-1730h Fellows Review Subcommittee, *Pearl 3 (SH)*

Monday, May 27

- 0800-1000h Joint Journal Editorial Board, *Majestic 6 (SH)*
- 1030-1130h Sponsorship Committee, *Majestic 7 (SH)*
- 1300-1430h Education Committee, *Majestic 10 (SH)*
- 1300-1500h ECS Transactions Editorial Advisory Board, *Majestic 6 (SH)*
- 1500-1630h Individual Membership Committee, *Majestic 7 (SH)*
- 1530-1630h Interdisciplinary Science and Technology Subcommittee, *Majestic 11 (SH)*

Tuesday, May 28

- 0700-0930h Symposium Planning Advisory Board, *Majestic 1 (SH)*
- 0730-0930h Council of Past Presidents, *Majestic 11 (SH)*
- 0930-1130h Publications Subcommittee, *Majestic 6 (SH)*
- 1400-1600h Meetings Subcommittee, *Majestic 11 (SH)*
- 1600-1800h Honors and Awards Committee, *Majestic 10 (SH)*

Wednesday, May 29

- 0700-1000h Technical Affairs Committee, *Majestic 11 (SH)*
- 1100-1200h Development Committee, *Majestic 10 (SH)*

Thursday, May 30

- 0800-1200h Board of Directors Meeting, *Majestic 1 (SH)*





**Princeton
Applied
Research**



**solartron
analytical**



EnergyLab and PARSTAT MC

AC and DC Accuracy
Anode/Cathode EIS
Reputation

AMETEK

www.ameteksi.com

Stop by and say hello!

New
Product



New
Virtual
Product

Announcing the WaveDriver 100
Potentiostat with EIS



Software

Detailed information about our software, which includes AfterMath and legacy PineChem



Applications

Application notes discuss practical aspects of conducting specific experiments



Theory

Fundamental electrochemical theory presented in a brief and targeted manner



Instrument Specifications

Complete lists of all instrument specifications, such as electrode rotators and potentiostats

Introducing the new Knowledgebase



www.pineresearch.com

Plenary & Awards

The Plenary Session

Monday, 1700-1800h
Room: Lone Star A3/A4 (SCC)

Come together with participants from every symposium for the Plenary Session and recognize, honor, and listen to some of the greatest minds in the field. Join ECS President, Yue Kuo, as he congratulates distinguished Society award winners Héctor Abruña, receiving the Allen J. Bard Award in Electrochemical Science

and David Lockwood, receiving the Gordon E. Moore Medal for Outstanding Achievement in Solid State Science and Technology. He will also honor the many Divisional award winners and welcome the highly anticipated ECS lecturer, Koen Kas from Ghent University.

The ECS Lecture

Guardian Angels turning Sickcare into Healthcare by Koen Kas, Ghent University



KOEN KAS is a healthcare futurist, entrepreneur, professor of molecular oncology, acclaimed international keynote speaker, and author of Sick No More and Your Guide to Delight.

He is founding CEO of HealthSkouts and partner at HealthStartup.eu, a social network of novel health start-ups. His team combines real world data, collected via biomarker and sensor measurements,

with design and business model innovations into novel, delightful experiences redefining health, helping shape a new breed of digital health companies.

Kas is a professor of oncology at Ghent University in Belgium, and chairs the scientific committee of the European Cancer Prevention Organization. He is an ambassador for Health House and serves on the advisory board of seven pioneering healthcare companies, and is a digital health investor. He is a juror of the Prix Galien and an editor of the mHealth journal and the European Journal of Cancer Prevention.

Kas was CSO Oncology at Thrombogenics, from which he spun out the biotech company Oncurious and tested a novel drug for pediatric brain cancer. Before this, he was founder and CSO of Pronota, building a protein biomarker discovery platform and pipeline of four diagnostic programs, and was also the director of drug discovery at Galapagos. Previously he set up and directed the cancer drug discovery program at Tibotec (now part of Johnson & Johnson). He started his career elucidating the molecular basis of two types of cancers.

5 QUESTIONS with Koen Kas

“Open data is the only way to move the world forward, learning from give and take to find new ways to connect the dots and have new insights.”

What got you interested in healthcare and biomedical sciences?

I think I have a natural born curiosity. What always has fascinated me, even as a little child, is basic biology. How do you create something out of nothing? How do you create a human being? Life has continued to fascinate me, and that is the real reason why I have a biomedical background and why I choose to specialize in oncology.

What got you interested in healthcare specifically?

I spent the first four or five years really in academia, elucidating the biology of a number of cancers and working with cancer patients after getting my degree. I've studied cancer to understand what went wrong at the genetic level.

That background made me think, “Why do we get sick in the first place? Why do we wait so long till we get sick?”

Then, what triggered a complete shift in my career was my first visit to mainland China where I discovered for the first time that more than 2,200 years ago, in some parts of China, the doctor got paid as long as people in the village remained healthy. Once they got sick they no longer had to pay. That blew my mind.

I started to question why we lost that Chinese system? Because in all honesty, I don't think we have healthcare. I think we have sickcare. We wait till we get sick, and very often that's too late.

That will be part of what I'm going to present at the ECS meeting. I'm going to show that although we cannot predict the future, I'm absolutely convinced that we can create the future and that what The Electrochemical Society and others working on these kinds of topics do will be fundamental in making that shift from sickcare to healthcare.

You're giving the ECS lecture which is the big lecture of the week of the 235th ECS meeting. We're a bunch of electrochemists, a bunch of solid-state scientists, and other niche areas that we cover, why do you think a bunch of electrochemists invited you to speak?

Healthcare is pretty slow in keeping up with the entire digital shift. Nevertheless, the real revolution I think is going to start on the top of the shoulders of the digital one; that's the biological revolution. And I think that electrochemical engineers are really at the interface of what digital and what biology brings together. It's electrochemistry; the name itself already implies it.

Society Awards

Allen J. Bard Award in Electrochemical Science

Monday 1000h
Houston Ballroom B (SCC)

**Energy Conversion and Storage:
Novel Materials and Operando Methods**
by Héctor D. Abruña



HÉCTOR D. ABRUÑA is the Émile M. Chamot Professor of Chemistry and the director of the Center for Alkaline-Based Energy Solutions and the Energy Materials Center at Cornell University.

He completed his graduate studies with Royce W. Murray and Thomas J. Meyer at the University of North Carolina at Chapel Hill in 1980 and was a postdoctoral research associate with Allen J. Bard at the University of Texas at Austin from 1980 to 1981. After

a brief stay at the University of Puerto Rico, he joined Cornell University in 1983. He was chair of the Department of Chemistry and Chemical Biology from 2004 to 2008.

Abruña has been the recipient of numerous awards, including a Presidential Young Investigator Award, an A. P. Sloan Fellowship, a J. S. Guggenheim Fellowship, and a J. W. Fulbright Senior Fellowship. He is a recipient of the Electrochemistry Award of the American Chemical Society (2008) and the C. N. Reilley Award in Electrochemistry (2007). He was elected Fellow of the American Association for the Advancement of Science in 2007, member of the American Academy of Arts and Sciences in 2007, and Fellow of the International Society of Electrochemistry in 2008. He received

the David C. Grahame Award from The Electrochemical Society in 2009, the Faraday Medal of the Royal Society in 2011, and the Brian Conway Prize from the International Society of Electrochemistry in 2013. He was named Fellow of The Electrochemical Society in 2013, and in 2017 was the recipient of the Gold Medal of the International Society of Electrochemistry. Most recently, he was elected member of the National Academy of Sciences.

Abruña is the coauthor of over 480 publications (h-index=85) and has given over 600 invited lectures worldwide. He considers his 55 PhD students and 70 postdoctoral associates his most important professional achievement.

Gordon E. Moore Medal for Outstanding Achievement in Solid State Science and Technology Award

Monday 1410h
City View 2 (SH)

**Silicon-Based Photonic Integrated Circuits:
The Quest for Compatible Light Sources**
by David Lockwood



DAVID J. LOCKWOOD obtained his PhD from Canterbury University, New Zealand, in 1969 and was awarded a DSc in 1978 from Edinburgh University, United Kingdom, for his work on the electronic, optical, and magnetic properties of solids.

He carried out postdoctoral work in physical chemistry at Waterloo University, Canada, (1970–1971) and was a research

(continued on next page)

I think what might be a reason to invite me is the vision I have. That if we understand why we get sick in the first place—and the real reason is that we hardly have any insights in who the patient is—scientific understandings and technological developments coming out of ECS will be instrumental in getting to know patients.

For example, if I send a package with FedEx or with UPS from Dallas to New York, I can go to a website and trace every single step of the package and know where it is, which I find normal. If I look to my average patient, my cancer patient, my Alzheimer's patient, my diabetic patient, that patient is 8,700 hours a year by himself or herself; not linked to the healthcare system. So a FedEx package is better off than me as a patient. That is not normal.

Facebook was recently in big trouble for sharing user information. It sounds like there may be a roadblock in getting people over the fear of sharing their medical information, for the same reasons. Do you think people will resist this idea to monitor and broadcast their health 24/7?

If I get you more in return to what you give, you'll get it.

For example, if you go to Disneyland, you get a box sent home with magic bands. It's a band with your name on it, a band with the name of your partner, and the bands with the names of your kids on it.

The product makes it so that you can pay wirelessly, and it'll alert you on the best wait times. The band tells me, "Here Koen, if you leave now from where you are in Disneyland to Avatar there is no line." I'm willing to give up my exact location in order to get a service in return.

We'll be willing to give an exchange of data because we're going to realize that giving something offers us the best chance to remain healthy.

Because ECS is big on open access and open science, where do you come down on that, as far as how important you think open science is to innovation and smart technologies?

Open data is the only way to move the world forward. It is something I evangelize everywhere.

A few years ago, Elon Musk made his entire IP open source. Not kidding. That's not altruism. You know why he did that? He did that because he wanted as much other automobile companies possible to start building electric cars, for one simple reason, he was building the Gigafactory in Nevada: the biggest battery factory which is now coming to completion. The more electric cars people build, the more batteries he can sell.

I am a big believer open data ... to find new ways to connect the dots and to have new insights. And I think at the very end that is what makes us human; it's the ability to see links across different silos and combine different domains together. That is what electrochemistry has done already for hundreds of years; it's engineering and chemistry and biology. ■

Society & Division Awards

fellow at Edinburgh University (1972–1978) before joining the National Research Council of Canada in 1978, where he is presently a researcher emeritus. There, his research has centered on the optical properties of low-dimensional materials and has focused on Group IV and III-V semiconductor nanostructures.

Lockwood has published more than 600 scientific articles in journals and books, and has six U.S. patents. He is a fellow of the Royal Society of Canada, The Electrochemical Society, the American Physical Society, and the Institute of Physics, and has served on the editorial boards of six physics journals in addition to being the founding editor of the Nanostructure Science and Technology book series.

He has received six major awards from within Canada and abroad. Within ECS, he has co-organized numerous symposia, served on the board of directors, and chaired the Luminescence and Display Materials Division.

Leadership Circle Award

ECS is proud to recognize long-standing institutional members through our Leadership Circle Awards.

Our institutional members are truly partners of ECS and their commitment to our organization highlights their drive towards the advancement of electrochemistry and solid state science. Our Leadership Circle Awards distinguishes those members who have maintained continuous membership in good standing with ECS.

We would like to thank and congratulate the below institutional members for reaching their milestone level in 2019. These companies have been tremendous partners to ECS and we appreciate all the support they have given the society over the years.

Silver Level – 10 years

Gelest, Inc.
Los Alamos National Laboratory

Bronze level – 5 years

El-Cell GmbH
Ford Motor Company
Ion Power Inc.
SanDisk
Tianjin Lishen Battery Joint-Stock Co., Ltd

The milestone achievements that a member can obtain are listed below:

Legacy Level (70+ years)	Gold Level (25 years)
Medallion Level (65 years)	Silver Level (10 years)
Diamond Level (50 years)	Bronze Level (5 years)

You can view what our members are saying about the Institutional Membership Program on our website: <https://www.electrochem.org/institutional-membership>

Contact the director of community engagement, Shannon Reed, if you would like to learn more about the Institutional Membership Program:

Shannon.Reed@electrochem.org

Division Awards

Dielectric Science and Technology Division Thomas D. Callinan Award

Tuesday 1410h
City View 2 (SH)

**Colorful Adventures in the Field of Dielectrics Science:
Some Highs and Lows with a Touch of a Chilly Forecast**
by Sean King



SEAN KING has worked in the semiconductor industry for 22 years and currently serves as a senior technical contributor within Intel Corporation's Portland Technology Development Division. At Intel, King has held a variety of technical positions in the development of Intel's 0.35 μm 7 nm technologies, and presently leads the development of various dielectric materials for use in Intels < 7 nm technologies. He is also a faculty member of Intels College of

Engineering, where he teaches courses in nanoelectronic fabrication, vacuum and plasma science, and thin film deposition processes.

King is highly recognized for his significant contributions to the development, implementation, and fundamental understanding of low-k dielectric materials. In 2004, he received Intel's highest achievement award for the insertion of low-k dielectrics in the 90 nm technology. Since then, King has made seminal contributions to the growth, characterization, and integration of both low-k and high-k dielectric materials.

Additionally, King is an active member of numerous technical societies, including The Electrochemical Society, the American Vacuum Society, and the Materials Research Society, for which he has served as an organizer of numerous symposia and a member of various society committees. King has authored or coauthored over 175 publications and 50 patents in the fields of dielectric and semiconducting materials.

King holds a BS degree in materials engineering from Virginia Tech and a PhD in materials science and engineering from North Carolina State University.



Your article. Online. FAST!

**Connect to more than
151,000 articles and abstracts
in all areas of electrochemistry and
solid state science and technology.**

www.ecsd.org

Division Awards

Electronics and Photonics Division Award

Monday 0800h
Austin Ballroom 1 (SH)

**New Directions in GaN Electronic and Photonic Devices
Enabled By Electrochemical Processes**
by Jung Han



JUNG HAN is the William A. Norton Professor in Technological Innovation and a professor of electrical engineering at Yale University. He received his PhD in electrical engineering from Purdue University in 1992. His research focuses mainly on epitaxial growth and nanoscale synthesis of wide-bandgap semiconductors for energy-efficient lighting, display, and power applications.

Han's doctoral and postdoctoral work at Purdue resulted in one of the first semiconductor blue-green diode lasers from the II-VI ZnSe system. Between 1996 and 2001, Han led a team at Sandia National Laboratories in studying the heteroepitaxial science of III-nitride semiconductors and pioneered the usage of in situ diagnostics that have since then become industry standard. He was responsible for demonstrating some of the earliest AlGaIn ultraviolet LEDs and transistors.

He is the cofounder of Saphlux, a start-up company based on his inventions for semipolar GaN light-emitting diodes.

Han has published more than 280 papers in peer-reviewed journals and holds more than 20 U.S. and international patents. Han has received numerous awards, including a Department of Commerce R&D 100 Award, an MRS Ribbon Award, and an EMC Best Paper Award. Han is a member of the Connecticut Academy of Science and Engineering and a fellow of the Institute of Physics, the Institute of Electrical and Electronic Engineers, and the Optical Society of America.

Energy Technology Division Research Award

Tuesday 1720h
Houston Ballroom C (SCC)

**Transition Metal-Nitrogen-Carbon Catalysts
for Oxygen Reduction Reaction:
Surface Chemistry, Morphology and Reactivity**
by Plamen Atanassov



PLAMEN ATANASSOV graduated from the University of Sofia with an MS in chemical physics and earned a doctorate from the Bulgarian Academy of Sciences in physical chemistry.

He moved to the U.S. in 1992 and was with the University of New Mexico until 2018. While at the University of New Mexico, Atanassov worked as a research faculty member, participated in a start-up, rose to the rank of distinguished professor of

chemical and biological engineering, started the Center for Emerging Energy Technologies, and served as the associate dean for research before assuming his final post as director of the Center for Micro-Engineered Materials.

In October 2018, Atanassov became chancellor's professor of the Chemical & Biomolecular Engineering Department of the Henry Samueli School of Engineering at the University of California, Irvine. His research is in nanostructured materials and new technologies for energy conversion and storage, focusing on electrocatalysis and

bioelectrocatalysis, with applications in fuel cells, electrolyzers, and bioelectrochemical systems.

Atanassov is a fellow of The Electrochemical Society and the National Academy of Inventors. He has served as a vice president of the International Society of Electrochemistry. He holds 55 issued patents, half of which have been licensed and are at the core of several catalysts. He has published more than 370 peer-reviewed papers and 20 book chapters, and has edited a book (h-index=70). He has graduated 34 PhD students.

Energy Technology Division Supramaniam Srinivasan Young Investigator Award

Monday 1440h
San Antonio Ballroom B (SCC)

**Towards Deterministic Electrode Design:
Elucidating the Role of Surface Chemistry and
Microstructure on Flow Battery Performance**
by Fikile Brushett



FIKILE BRUSHETT is an associate professor in the Department of Chemical Engineering at the Massachusetts Institute of Technology (MIT), where he holds the Cecil and Ida Green Career Development Chair. He received his BSE in chemical and biomolecular engineering from the University of Pennsylvania in 2006 and his PhD in chemical engineering from the University of Illinois at Urbana-Champaign in 2010 under the supervision of Professor Paul J. A. Kenis.

From 2010 to 2012, he was a director's postdoctoral fellow in the Electrochemical Energy Storage Group at Argonne National Laboratory under the supervision of Dr. John T. Vaughey. In 2013, he started his independent career at MIT, where his research group seeks to advance the science and engineering of electrochemical technologies that enable a sustainable energy economy.

He is especially interested in the fundamental processes that define the performance, cost, and lifetime of present-day and future electrochemical systems. His group currently works on redox flow batteries for grid storage and electrochemical processing of carbon dioxide and biomass. He also serves as the research integration co-lead for the Joint Center for Energy Storage Research, a DOE-funded Energy Innovation Hub.

Energy Technology Division Graduate Student Award sponsored by Bio-Logic

Thursday 1200h
City View 8 (SHH)

**Biomass-Derived Carbon Materials for Next-Generation
Electrochemical Energy Storage Systems**
by Zan Gao



ZAN GAO is currently a mechanical engineering PhD candidate at the University of Virginia under the supervision of Professor Xiaodong Li. Gao received both his BS degree in environmental engineering (2009) and his MS degree in applied chemistry (2012) from Harbin Engineering University.

Gao's doctoral research focuses on the design and fabrication of next-generation flexible energy storage systems (flexible supercapacitors and flexible batteries) with

(continued on next page)

Division Awards

mechanical durability and chemical stability. He has also made significant contributions to biomass-derived renewable carbon materials for electrochemical energy storage. He has recently begun working on understanding the failure mechanism of flexible energy systems by coupling nanomechanics and electrochemistry.

Gao has published over 40 peer-reviewed articles in various prestigious journals, such as Nature Communications, Nano Letters, Nano Energy, Advanced Functional Materials, Chemistry of Materials, and the Journal of Materials Chemistry A. Additionally, Gao has received several awards and fellowships during his PhD studies, including the Outstanding Graduate Student Award, the William L. Ballard Jr. Endowed Graduate Fellowship, and the Volkswagen Group of North America Fellowship.

Industrial Electrochemistry and Electrochemical Engineering Division New Electrochemical Technology (NET) Award

Monday 1400h
San Antonio Ballroom B (SCC)

Development and Commercialization
of Large Scale PEM Water Electrolysis
by Rainey Yu Wang of Hydrogenics Corporation



RAMI MICHEL ABOUATALLAH worked for 15 years at **Hydrogenics Corporation**, where he was a senior research engineer from 2002 to 2008, and then manager of advanced stack development from 2008 to 2017. He was passionate about PEM fuel cells and electrolyzers, and a true believer in hydrogen technology. From 2010 to 2017, Abouatallah led the development of a large-scale PEM electrolyzer stack platform, which is the subject of the 2019 ECS Industrial

Electrochemistry and Electrochemical Engineering Division New Electrochemical Technology (NET) Award.



During his career at Hydrogenics Corporation, Abouatallah coauthored more than 15 peer-reviewed journals, conference publications, as well as a number of industrial studies. He held a number of Canadian and U.S. patents.

In 2002, Abouatallah received his PhD degree from the Department of Chemical Engineering and Applied Chemistry at the University of Toronto. His doctoral dissertation was "Reactivation of Nickel Cathodes by Vanadium Species during Alkaline Water Electrolysis." During his study at the University of Toronto, he was the recipient of a dozen undergraduate and graduate awards.

Abouatallah passed away unexpectedly at home on December 8, 2017, at the age of 43. He will always be remembered by his family, friends, and colleagues.

Industrial Electrochemistry and Electrochemical Engineering Division Student Achievement Award

Wednesday 1400h
Pearl 5 (SHH)

Fundamental Understanding on Cell Performance
Enhancement of Flow Batteries
with Serpentine Flow Field Structures
by Xinyou Ke



XINYOU KE received his PhD from the Department of Mechanical and Aerospace Engineering at Case Western Reserve University in fall 2018. His PhD dissertation defense was titled "Fundamental Studies on Transport Phenomena in Redox Flow Batteries with Flow Field Structures and Slurry or Semi-Solid Electrodes: Modeling and Experimental Approaches."

He has been supervised by professors Robert F. Savinell, Joseph M. Prael, and Jesse S. Wainright. He was previously trained at the Massachusetts Institute of Technology, Harvard University, Case Western Reserve University (MSE), and the South China University of Technology (BSE with honors).

He has focused on exploring fundamentals of high-performance flow batteries with flow field structures, electronic conduction mechanisms of slurry or semi-solid electrodes used for flow batteries, and electrochemical flow capacitors through both modeling and experimental approaches.

To date, he has authored or coauthored more than 10 peer-reviewed journal articles. He was the recipient of the 2018 ECS F. M. Becket Summer Research Fellowship. He served as the treasurer of the ECS Case Western Reserve University Student Chapter from 2016 to 2017.

Industrial Electrochemistry and Electrochemical Engineering Division H. H. Dow Memorial Student Achievement Award

Tuesday 0900h
Pearl 5 (SH)

Transport Study inside Porous Layers
of PEFC Using Direct Numerical Simulation
by Pongsarun Satjaritanun



PONGSARUN (BOOM) SATJARITANUN received his BS and MS in mechanical engineering from Chiang Mai University, Thailand.

He is currently working toward his doctoral degree in chemical engineering at the University of South Carolina. His current research focuses on (1) numerical modeling of transport phenomena inside micro- to nano-structured porous materials in fuel cell systems, (2) developing a mathematical model for electrochemical impedance spectroscopy to explain the behavior of microbial activities for methane production from organic waste, (3) numerical modeling and design optimization of solid particle mixing with contra-rotating impellers, and (4) developing simulations of multiphase, reactive flow with vaporization of H₂SO₄ and SO_x in a solar-driven sulfuric acid decomposition reactor.



Interested in funding an ECS award?

Your organization can help
support the remarkable work of
leading researchers in the field.

Learn more by contacting Ngoc Le
in the ECS Development Office,
development@electrochem.org.

Division Awards

Nanocarbons Division Richard E. Smalley Research Award

Monday 0800h
City View 6 (SH)

Multifunctional Hybrid Carbon Interfaces by Maurizio Prato



MAURIZIO PRATO graduated from the University of Padova, where he was appointed assistant professor in 1983. In 1992, he moved to the University of Trieste as an associate professor, later becoming a full professor in 2000. In 2015, he also took on the role of Ikerbasque research professor at CIC biomAGUNE in Spain.

He spent sabbatical terms at Yale University and the University of California, Santa Barbara. He was the recipient of an

ERC Advanced Research Grant in 2008 and became a member of the Accademia Nazionale dei Lincei in 2010 and the Istituto Veneto di Scienze Lettere ed Arti in 2018. He is also a member of Accademia Europea and the European Academy of Sciences.

His research focuses on the synthesis and applications of new functional materials. He has worked with carbon nanostructures, including fullerenes, carbon nanotubes, and graphene, developing a series of reactions that make these species more biocompatible, less or even nontoxic, amenable to further functionalization, and easier to manipulate. He is interested in transferring the properties of these materials into applications, which include spinal cord repair, the splitting of water, and the reduction of carbon dioxide into useful chemicals.

Physical and Analytical Electrochemistry Division David C. Grahame Award

Tuesday 0830h
Trinity 3 (SHS)

Electroanalytical Techniques for Studying Nitrogenase Enzyme Mechanisms by Shelley Minteer



SHELLEY MINTEER is a Utah Science Technology and Research Initiative professor in both the Department of Chemistry and the Department of Materials Science and Engineering at the University of Utah.

She received her PhD in analytical chemistry at the University of Iowa in 2000, under the direction of Professor Johna Leddy. After receiving her PhD, she spent 11 years as a faculty member in the Department of Chemistry at Saint Louis University before

moving to the University of Utah in 2011.

Minteer was the technical editor for the *Journal of The Electrochemical Society* from 2013 to 2016 and is presently an associate editor for the *Journal of the American Chemical Society*.

Minteer has won several awards, including the Luigi Galvani Prize of the Bioelectrochemical Society, the American Chemical Society Division of Analytical Chemistry Award in Electrochemistry, the International Society of Electrochemistry Tajima Prize, and the Society of Electroanalytical Chemists' Young Investigator Award. She has also been named Fellow of The Electrochemical Society.

Her research interests focus on electrocatalysis and bioanalytical electrochemistry. She has expertise in electrosynthesis, biosensors, biofuel cells, and bioelectronics.

Save the Date!



PRiME 2020 Honolulu, HI

October 4-9, 2020

Hawaii Convention Center & Hilton Hawaiian Village

The joint international meeting of:

238th Meeting of The Electrochemical Society
2020 Fall Meeting of the Electrochemical Society of Japan
2020 Fall Meeting of the Korean Electrochemical Society

Start making your plans now,
the call for papers will be published in November 2019!

Exhibitors

Technical Exhibit

Thank you to the 235th ECS Meeting Exhibitors!

The exhibitors in Dallas, TX will showcase some of the greatest innovations in the industry including cutting-edge instruments, materials, systems, publications, and software, as well as other products and services. Don't miss the opportunity to gain face to face time with industry experts.

Location

The Exhibit Hall will be located on Level 2, Lonestar Ballroom in the Sheraton Dallas.

Exhibit Hours

Monday, May 27

1200-1700h	Exhibitor Move-In
1400-1700h	Poster Move-In
1800-2000h	Technical Exhibit, General Poster Session

Tuesday, May 28

1400-1700h	Poster Move-In
1400-2000h	Technical Exhibit
1530-1600h	Networking Break
1800-2000h	General and Student Poster

Wednesday, May 29

1400-1700h	Poster Move-In
1400-2000h	Technical Exhibit
1530-1600h	Networking Break
1800-2000h	General Poster Session
2000-2200h	Optional Technical Exhibit Tear Down

Thursday, May 30

0900-1200h	Technical Exhibit Tear Down
------------	-----------------------------

Exhibitors

Admiral Instruments

Booths: 403 & 502

Mark Sholin
 mark@admiralinstruments.com
 3150 N 24th St
 Suite B-102
 Phoenix, AZ, 85016
 USA



1.480.256.8706
 www.admiralinstruments.com

Admiral Instruments is a potentiostat design and manufacturing company based in the USA. We offer a growing selection of electrochemistry instruments including the modestly-priced, easy-to-use family of Squidstat™ potentiostats and the entire collection of high-performance workstations from Zahner Scientific Instruments.

Our wide variety of products are uniquely positioned to satisfy those with limited budgets or those seeking highly precise and specialized measurement capabilities, including challenging multi-sine EIS and equivalent circuit modeling. Visit our booth to try the recently launched Squidstat Plus potentiostat priced at \$4,900, featuring a +/- 1 A maximum current and EIS up to 1 MHz.

ALS Co., LTD

Booth: 408

Katsunobu Yamamoto
 yamamoto@bas.co.jp
 1-28-12 Mukojima
 Sumida-ku, Tokyo, 131-0033
 Japan

+81 3 3624 0331
 www.als-japan.com



ALS provides researchers with a wide range of products for electrochemistry and spectroelectrochemistry applications, including Bi-Potentiostat (Model 2325), Ring-Disk Electrode apparatus (RRDE-3A), Spectrometer Systems (SEC2020), and Faraday cage (CS-3A). We also dealing with various kinds of Spectroelectrochemical cells (SEC-C/SEC-2F), Quartz Crystal Microbalances cell/Quartz crystal(QCMT/EQCMT), and Electrodes/Accessories for EC measurement same as their related items.

Technical Exhibit

Arbin Instruments

Booths: 202 & 204

Antony Parulian
Antony@arbinmail.com
762 Peach Creek Cut Off Road
College Station, TX, 77845
USA



1.979.690.2751
www.Arbin.com

Arbin Instruments manufactures multi-channel testing instruments for electrochemistry, battery, supercapacitor, and flow battery applications. We offer high-precision instruments using technology developed from an ARPA-E grant along with leading industry partners.

The American Society of Mechanical Engineers (ASME)

Literature Display

Wilson K.S. Chiu, PhD
wchiu@engr.uconn.edu
2 Park Avenue, 6th Floor
New York, NY, 10016-5990
USA



www.asmedigitalcollection.asme.org

ASME publishes some of the most prestigious engineering journals in the world as one way to fulfill its ongoing mission of being an essential resource for professionals seeking engineering solutions to global challenges. The ASME Digital Collection is ASME's authoritative online reference for the mechanical engineering and related research communities. It provides unparalleled depth, breadth, and quality of peer-reviewed content with powerful search tools that retrieve content simultaneously from journals (1960 to present), conference proceedings (2000 to present, plus select proceedings back to 1955), and eBooks (1993 to present, plus select titles back to 1944).

BASi

Booth: 404

Dane Brankle
dbrankle@BASinc.com
2701 Kent Ave.
West Lafayette, IN, 47906
USA



1.765.497.8474
www.BASinc.com

BASi (Bioanalytical Systems Inc.) has been manufacturing electrochemistry lab equipment for over four decades and is recognized globally for our expertise in electroanalytical chemistry. We manufacture instrumentation in West Lafayette, IN, and provide contract research services for the pharmaceutical industry

Bio-Logic USA

Booths: 309, 311 & 313

David Carey
david.carey@bio-logic.us
9050 Executive Park Drive, Suite 100C
Knoxville, TN, 37923
USA



1.865.769.3800
www.bio-logic.net

Bio-Logic is the exclusive provider of EC-Lab electrochemical instruments. The EC-Lab family of products includes modular single-channel (SP-50/150/200/300) and multi-channel (VSP/VMP3/VSP-300/VMP-300) potentiostats/galvanostats, High current potentiostats (HCP-803/1005) and easy to use software. Additionally, Bio-Logic offers a complete line of electrochemical accessories, including cells, electrodes, and ancillary instruments. Bio-Logic is also the provider of BT-Lab line of battery cyclers (MPG-2xx and BCS-8XX families), the SCAN-Lab line of localized electrochemical scanning systems (M470 modular system and SECM 150), and the MT-Lab materials analysis systems (MTZ-35 FRA and high temperature sample holder). Come to booths 313, 311, & 309 to learn more about our entire line of products.

Bruker Optics

Booth: 400

Sergey Shilov
Info.bopt.us@bruker.com
40 Manning Rd.
Billerica, MA, 01821
USA



1.978.439.9899
www.bruker.com

Bruker Optics offers Infrared, Near Infrared, and Raman spectrometers which fit a wide range of applications. The combination of FT-IR spectroscopy with the electrochemistry provides information about molecular change during electrochemical reactions in an addition to the electrochemical response of the studied material. Visit us at www.bruker.com/optics

De Nora

Booth: 109

Chuck Schultz
Chuck.Schultz@denora.com
7590 Discovery Lane
Painesville, OH, 44077
USA



www.denoratech.com

De Nora is the largest electrode supplier for electrochemical applications in the world. We are the largest manufacturer of insoluble electrodes for applications such as Chlor-Alkali, Surface Finishing, Water Treatment, and Cathodic Protection. Our coated titanium electrode technology provides significant performance and lifetime advantages in many red-ox flow batteries. As the owner of E-Tek® gas diffusion electrode (GDE) technology, we have a wide variety of catalysts and gas diffusion electrodes for many fuel cell technologies. Come talk to us about your applications!

(continued on next page)

Technical Exhibit

The Electrochemical Society

Booths: 401 & 500

ecs@electrochem.org
65 South Main Street, Building D
Pennington, NJ, 08534-2839
USA



1.609.737.1902
www.electrochem.org

The Electrochemical Society has been a nonprofit academic publisher since 1902 and is now home to over 8,000 electrochemists, chemical engineers, and solid state scientists. We are students, teachers, and industry leaders, in over 85 countries.

ECS bridges the gap between the corporate, academic, and government sectors by supporting the participation of scientists from around the world and promoting innovation in scientific thought through the dissemination of peer-reviewed journals and organizing technical meetings.

Stop by each night to enter to win the following raffles:

- Monographs (*Electrochemical Impedance Spectroscopy*, second edition and *Atmospheric Corrosion*, second edition)
- Free Meeting Registration for ECEE 2019 in Glasgow, Scotland and the 236th ECS Meeting in Atlanta, GA
- Free 5-Year Membership

Furuya Metal Americas, Inc.

Booth: 101

Takuya Nakamura
nakamura@furuya-ma.com
250 Commercial Street
Ste 34012
Manchester, NH, 03101
USA



1.603.518.7723
www.furuya-ma.com

Furuya Metal has been supplying Electrocatalysts for PEM-Water Electrolysis, OER catalysts for FC, etc. Furuya also provides Coating Services to coat any materials on micron – nano size Powders for material development of All Solid State Battery. Please come see us for details.

Gamry Instruments

Booths: 412 & 413

Jerome Babauta
jbabauta@gamry.com
734 Louis Dr.
Warminster, PA, 18974
USA



1.215.682.9330
www.gamry.com

Gamry Instruments designs and manufactures high-quality electrochemical instrumentation and accessories – Potentiostats, Multichannel Potentiostats, Quartz Crystal Microbalance and Electrochemical Accessories, Cyclic Voltammetry, Electrochemical Impedance Spectroscopy, Cyclic Charge/Discharge, and Chronoamperometry. Our full lineup includes single and multichannel potentiostats from 600 mA to 30 A all capable of EIS, IMPS/IMVS, and a quartz crystal microbalance.

HEKA

Booth: 411

Frank Wang
Frank.Wang@HEKA.com
84 October Hill Road
Holliston, MA, 01746
USA



1.508.893.8999
www.HEKA.com

HEKA develops and manufactures sophisticated instrumentation for electrochemical research applications. With expertise in electrochemistry, small-current sensing, photonics, and microscopy imaging, we offer the EIProScan series of scanning probe microscopes (SECM, SPECM, SECCM) for interdisciplinary applications in Energy, Photoelectrochemical and Environmental processes, Biophysical and Neurochemical Imaging and Sensing, Corrosion, and Nanoelectrochemistry.

Hidden Analytical, Inc.

Booth: 200

Mark Buckley
info@HiddenInc.com
37699 Schoolcraft Road
Livonia, MI, 48150
USA



1.734.542.6666
Toll Free: 1.888.96.HIDEN
Fax: 1.734.542.6030
www.HiddenInc.com

Hidden Analytical, Inc. is known for high performance mass spectrometers for precision gas analysis, surface science applications, plasma characterization, and vacuum diagnostics. Showcasing systems for electrochemistry research, DEMS, reaction kinetics, and surface science. Our HPR Series provides for fast response in situ determination of gaseous and volatile electrochemical reactants, reaction intermediates, and products in real time.

IOP Publishing

Booth: 201

IOP Publishing

Lisa Searle
Temple Circus, Temple Way
Bristol BS1 6HG
United Kingdom
+44 (0)117 9297481
www.Ioppublishing.org

IOP Publishing is a society-owned scientific publisher, providing impact, recognition, and value for the scientific community. We work closely with researchers, academics, and partners worldwide to produce academic journals, ebooks, conference series, and digital products, covering the latest and best research in the physical sciences and beyond.

Technical Exhibit

Ivium Technologies B.V.

Booth: 305



Ross Archer
info@ivium.com
De Zaale 11 +31 40 2390600
Eindhoven, 5612AJ 1.800.701.4405
Netherlands www.ivium.com

Ivium Technologies develops electrochemical instrumentation for all applications. We have our high-end 24bit resolution portable CompactStat and all-around IviumStat potentiostats for the most demanding experiments. For labs on a budget, we have our Vertex potentiostat range, including our Vertex. One (also ideal for educational purposes). Our handheld pocketSTAT is designed for portability, and for multichannel applications and battery testing. We have our versatile Ivium-n-Stat and rack mountable OctoStat series. Various modules and power boosters are available.

Maccor, Inc.

Booth: 212



Mark Hulse
m.hulse@maccor.com
4322 S 49th W. Ave
Tulsa, OK, 74107 1.918.445.1496
USA www.maccor.com

Maccor manufactures testing equipment for the battery and energy storage market (i.e., batteries, capacitors, fuel cells, etc.). Maccor Inc. was the pioneer and is the world's largest commercial manufacturer for this type of equipment. More companies rely on Maccor everyday for their battery and cell test equipment needs. Today, Maccor has thousands of systems in operation in more than 50 countries.

Metrohm

Booths: 301 & 303



9250 Camden Field Parkway
Riverview, FL, 33578 1.813.316.4757
USA www.metrohm.com

Metrohm Electrochemistry supports high-impact research in electrocatalysis, energy, sensors, corrosion, bioelectrochemistry, and other interfacial processes. Our modular Autolab and portable DropSens instruments and accessories can easily grow with the demands of your projects. Options include EIS, low currents, analog sweeps, bipotentiostats, fast scanning, and various cells and electrodes including screen-printed electrodes.

neaspec GmbH

Booth: 103



Stefan Mastel
Stefan.mastel@neaspec.com
Eglfinger Weg 2
Haar, Bavaria, 85540 +49 89 420 797 203-30
Germany www.neaspec.com

neaspec is dedicated to delivering innovative solutions for nanoscale optical imaging & spectroscopy for researchers in industry and academia.

neaspec's NeaSNOM – the ultimate nanoanalytic microscopy platform for materials research and photonics – enables optical analysis of complex material systems at visible, infrared, and terahertz frequencies at a spatial resolution of 10 nm.

Neware Technology Limited

Booth: 113



Yitta Liu
Yitta@neware.com
22C, YHC Tower,
No. 1 Sheug Yuet Road
Kowloon, Hong Kong +86 13923782832
China www.newaretechnology.com

Neware is a leading battery testing system provider located in Shenzhen, China. Neware has been committed to providing high-performance battery testing system since 1998. Through two decades of innovation, Neware has provided more than 160,000 systems for about 26,000 clients worldwide.

PalmSens BV

Booth: 402



info@palmstens.com
Randhoeve 221,
3995 GA Houten, +31 30 245 92 11
The Netherlands www.palmstens.com

PalmSens was the first company producing research grade potentiostats in pocket size. The PalmSens4 is one of the most compact frequency response analyzers (EIS capable devices) in the market. We also launch the world smallest potentiostat at this ECS meeting. PalmSens makes electrochemistry more accessible for novice and advanced researchers.

(continued on next page)

Technical Exhibit

PAR/Solartron

Booths: 208 & 210



Rob Sides
Rob.Sides@ametek.com
801 South Illinois Ave.
Oak Ridge, TN, 37830
USA

1.865.483.2122
www.ameteksi.com

AMETEK Scientific Instruments is the innovator and leading manufacturer of potentiostats and frequency response analyzers. With both Princeton Applied Research and Solartron Analytical brands, our products are at the core of reference-grade research of batteries, fuel cells, corrosion, sensors, and general physical electrochemistry. Solartron is the preeminent expert in Electrochemical Impedance Spectroscopy, the go-to test method for characterization of energy-storage and energy-conversion devices.

Our users access more than 120 years of combined knowledge, expertise, products, and solutions of Princeton Applied Research and Solartron Analytical.

Our global presence offers users the ability to connect with local product and applications experts; combining large-company resources with individualized support.

Park Systems, Inc.

Booth: 410



Rich Oettinger
richard@parksystems.com
3040 Olcott Street
Santa Clara, CA, 95054
USA

1.408.986.1110
www.parksystems.com

Park Systems is a world-leading manufacturer of atomic force microscopy (AFM) systems with a complete range of products for researchers and industry engineers in the chemistry, materials, physics, life sciences, and semiconductor and data storage industries.

Pine Research Instrumentation

Booths: 317 & 416



Chris Smith
pinewire@pineresearch.com
2741 Campus Walk Ave., Bldg 100
Durham, NC, 27705
USA

www.pineresearch.com

Pine Research Instrumentation (Durham, NC, USA) has dedicated their design, support, service, and sales to the needs of the electrochemical community for over 50 years. We offer a complete line of trusted, high-quality, and affordable electrochemical instrumentation including potentiostats, electrode rotators, precision electrodes for rotating disk (RDE), rotating ring-disk (RRDE), and rotating cylinder (RCE) applications. We complement our instrumentation with a large variety of electrochemical accessories which support scientists who evaluate electrocatalytic systems like oxygen reduction reaction for fuel cells and carbon dioxide reduction for environmental remediation, as well as fuel stock production to interrogate corrosion inhibitor efficiency. Recently, we launched our WaveDriver 200 Bipotentiostat with EIS and our WaveVortex 10 Electrode Rotator—products requested by you and inspired by your research and industrial needs.

Scribner Associates, Inc.

Booth: 302



Marion Jones
marion@scribner.com
150 E Connecticut Ave.
Southern Pines, NC, 28387
USA

1.910.695.8884
www.scribner.com

Scribner Associates, Inc. specializes in the development and manufacture of advanced analytical hardware and software for Battery, Fuel Cell, Electrolyzer, and Redox Flow Battery testing. Our software packages such as ZPlot®, ZView®, MultiStat®, and CorrWare® are recognized worldwide as the gold standard for instrument control and data analysis.

Scribner has been producing innovative, high-quality products for over 30 years. Our products are backed by factory warranty, excellent worldwide customer service, and extensive technical support.

Sumitomo Electric Industries

Booth: 510



Chihiro Hiraiwa
Konohana-ku, Shimaya 1-1-3,
Osaka-shi 554-0024
Japan

+81 6 6466 5651
www.global-sei.com

The Sumitomo Electric Group is a global corporate group with 394 consolidated companies and over 248,330 employees in more than 40 countries around the world, primarily in Asia, America, and Europe. From an electric wire and cable manufacturer in Osaka 120 years ago, we have grown into a global leading company in 5 business domains: automotive, info-communications, electronics, energy and industrial materials industry.

Thermal Hazard Technology

Booth: 417



Danny Montgomery
Danny@thtuk.com
1 North House, Bond Avenue,
Bletchley, MK11SW
UK

+44 1908 646800
www.thtuk.com

Thermal Hazard Technology, a world leader in battery calorimetry and heat measurement, has a product range to meet the evolving requirements of the lithium battery industry. Latest products for battery component and battery cell testing include EV+ Accelerating Rate Calorimeter (EV+ ARC) and Isothermal Battery Calorimeters (IBC).

Technical Exhibit

Vida BioTechnology Co.,Ltd.

Booth: 111

Yu Han Dai
 yuhandai@vidabio.com.tw
 3F.-13, No.250-Incubation Center, Guoguang Rd.
 South Dist., Taichung City 402, +886 4 22850766
 Taiwan (R.O.C.) www.vidabio.com.tw



VidaBio is an innovative R&D company specialized in design and batch-manufacturing of nanomaterials- modified environmental and biosensors.

VidaBio develops and manufactures disposable electrochemical electrodes, based on screen printing, assembly, and waterproof package technology, enable to be a key component to develop chemical, immune, and biologic sensors based on electrochemistry.

Vigor Tech USA

Booth: 300

Guoming Zhong
 info@vigor-glovebox.com
 5100 Westheimer Rd, Suite 200,
 Houston, TX 77056 1.866.434.5717
 USA www.vigor-glovebox.com



Vigor Tech USA is one of the world's leading glovebox and inert gas purification companies. Our extensive experience in gas purification brings our customers the most innovative and advanced glovebox technology on the market. Vigor's ultra-low leakage rate, low energy consumption, and ultra-high purification efficiency make Vigor the best choice you can make for your research.

Wildcat Discovery Technologies

Booth: 203

Ana Kiricova
 akiricova@wildcatdiscovery.com
 6255 Ferris Square Suite A,
 San Diego, CA, 92121 1.858.550.1980
 USA www.wildcatdiscovery.com



Wildcat uses proprietary high throughput technology to accelerate the development of better battery materials. Wildcat's customers include material suppliers, cell makers, and OEM's in the automotive, electronics, medical, and military industries. Wildcat reduces R&D costs and helps its partners commercialize battery breakthroughs faster; cathodes, anodes, and electrolytes are all possible.

Xergy Inc.

Booth: 105

Jason Jin
 jason.jin@xergyinc.com
 299 Cluckey Drive
 Harrington, DE 19952
 USA 1.781.366.3222



XERGY Inc. is the world leader in development of advanced composite ion exchange membranes. XERGY designs, develops, manufactures, sells, and services a range of high performance devices, modules, stacks, and systems employing its XION Ion Exchange Membranes.



THT
THERMAL HAZARD TECHNOLOGY

**Calorimeters for Component,
Li-ion Battery and Module Testing**

ABUSE TESTING

- Thermal Runaway
- Video Monitoring
- Nail Penetration
- Short Circuit
- Overcharge

PERFORMANCE TESTING

- Heat Generation
- Heat Capacity
- Efficiency
- Lifecycle
- Infrared

UK • USA • India • China
Distribution Worldwide

www.thermalhazardtechnology.com

Sponsors

ECS thanks our meeting sponsors for the generous and continued support!

Gold



Silver



Bronze



Symposium Sponsors

ECS thanks our symposium sponsors for the generous and continued support!

Silver



Arbin Instruments

A01: Battery and Energy Technology
Joint General Session



Photon, Etc.

B02: Carbon Nanostructures
in Medicine and Biology



Sumitomo Electric

A03: Large Scale Energy Storage 10



Thermal Hazard Technology

A06: Battery Safety and Failure Modes

Bronze



National Renewable Energy Laboratory (NREL)

B01: Carbon Nanostructures for Energy
Conversion and Storage



University of Delaware,

Department of Chemical & Biological Engineering,
Center for Catalytic Science and Engineering

I06: An Invited Symposium on Advances and
Perspectives on Modern Polymer Electrolyte Fuel
Cells – In Honor of Shimshon Gottesfeld



Scribner Associates, Inc.

I06: An Invited Symposium on Advances and
Perspectives on Modern Polymer Electrolyte Fuel
Cells – In Honor of Shimshon Gottesfeld

Contributing

Applied Nanofluorescence, LLC

B09: Nano for Industry

Han Yi Technology Supplies Ltd.

H02: Solid-state Electronics and Photonics
in Biology and Medicine 6

IBM Research

G01: Silicon compatible materials, processes and technologies
for Advanced Integrated Circuits and Emerging Applications 9

Pacific Northwest National Laboratory

A03: Large Scale Energy Storage 10

TCI America

B09: Nano for Industry

Ion Power

Experts in Nafion™ - The Premium Perfluorosulfonic Acid Polymer



Nafion™

Authorized Distributor of Nafion™,
a Brand of The Chemours Company

Membranes - Dispersion - Pellets



NafionStore.com

US: +1 302-832-9550

EU: +49 8997007-170

| Sales@Ion-Power.com

Connect with Ion Power For customization of Nafion™ products for your application

Check us out on Social Media!

Ion Power

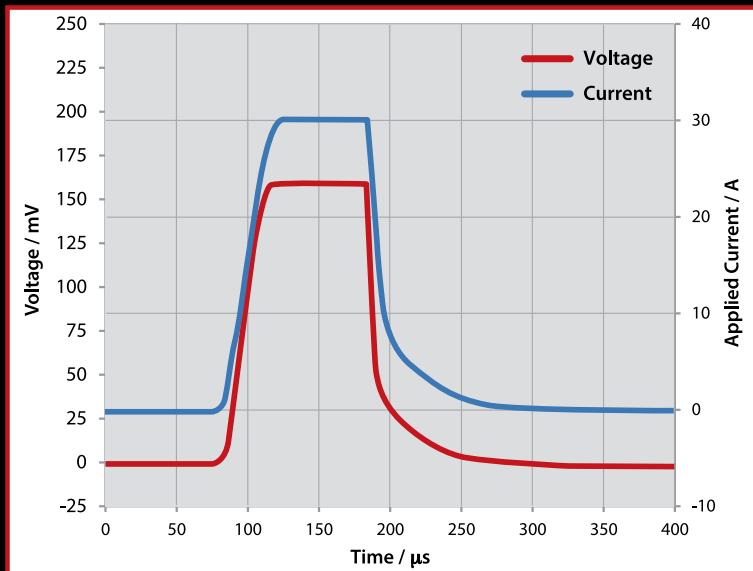


Rapid, High-Current Pulsing & Superior, Low-Impedance EIS

Reference 30K Booster

Nobody is faster

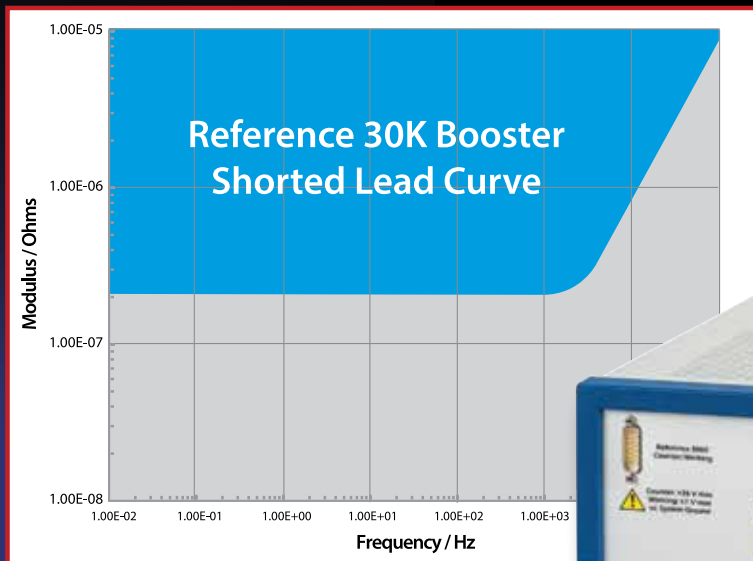
Distortion-free, rapid pulsing for charge and discharge



30 A Pulse on a 5 mOhm cell

Nobody goes lower

Up to 30A @ 20V, EIS to 300 kHz



200 nOhm Shorted Lead Curve

20 A rms, 0.9 m cell cable



GAMRY
INSTRUMENTS

www.gamry.com

Editorial Boards

Journal of The Electrochemical Society (JES)

Editor: Robert Savinell

Technical Editors

Doron Aurbach, Batteries and Energy Storage
David Cliffler, Physical and Analytical Electrochemistry,
Electrocatalysis, and Photoelectrochemistry
Gerald S. Frankel, Corrosion Science and Technology
Thomas F. Fuller, Fuel Cells, Electrolyzers, and Energy Conversion
Charles L. Hussey, Electrochemical/Electroless Deposition
Ajit Khosla, Sensors
Janine Mauzeroll, Organic and Bioelectrochemistry
Venkat R. Subramanian, Electrochemical Engineering

Associate Editors

Thierry Brousse, Batteries and Energy Storage
Scott Donne, Batteries and Energy Storage
Raymond J. Gorte, Fuel Cells, Electrolyzers, and Energy
Conversion
John Harb, Electrochemical Engineering
Takayuki Homma, Electrochemical/Electroless Deposition
Scott Lillard, Corrosion Science and Technology
Brett Lucht, Batteries and Energy Storage
Stephen Maldonado, Physical and Analytical Electrochemistry,
Electrocatalysis, and Photoelectrochemistry
Paul M. Natishan, Corrosion Science and Technology
Thomas J. Schmidt, Fuel Cells, Electrolyzers, and Energy
Conversion
Minhua Shao, Fuel Cells, Electrolyzers, and Energy Conversion
Venkat Srinivasan, Batteries and Energy Storage
Alice Suroviec, Physical and Analytical Electrochemistry,
Electrocatalysis, and Photoelectrochemistry
Nae-Lih (Nick) Wu, Batteries and Energy Storage

ECS Journal of Solid State Science and Technology (JSS)

Editor: Krishnan Rajeshwar

Technical Editors

Jennifer A. Bardwell, Electronic Materials and Processing
Francis D'Souza, Carbon Nanostructures and Devices
Peter Mascher, Dielectric Science and Materials
Kailash C. Mishra, Luminescence and Display Materials, Devices,
and Processing
Fan Ren, Electronic and Photonic Devices and Systems

ECS Editorial Advisory Committee

S.V. Babu
Lane Baker
Madhav Datta
Mike Hickner
Sean King
Rainer Küngas
Ramchandra Pode
Anant Setlur

ECS Transactions (ECST)

Editor: Jeffrey W. Fergus

ECST Editorial Advisory Board

Brett Lucht, Battery Division
Dev Chidambaram, Corrosion Division
Zhi (David) Chen, Dielectric Science and Technology Division
Stanko Brankovic, Electrodeposition Division
Robert Lynch, Electronics and Photonics Division
Cynthia Rice, Energy Technology Division
Cortney Kreller, High-Temperature Energy, Materials, & Processes
Division
John Harb, Industrial Electrochemistry and Electrochemical
Engineering Division
Mikhail Brik, Luminescence and Display Materials Division
Slava Rotkin, Nanocarbons Division
James Burgess, Organic and Biological Electrochemistry Division
Petr Vanýsek, Physical and Analytical Electrochemistry Division
Dong-Joo Kim, Sensor Division

Interface

Editor: Robert Kelly

Interface Advisory Board

Brett Lucht, Battery Division
Dev Chidambaram, Corrosion Division
Durga Misra, Dielectric Science and Technology Division
Philippe Vereecken, Electrodeposition Division
Jennifer Hite, Electronics and Photonics Division
Mani Manivannan, Energy Technology Division
Sean Bishop, High-Temperature Energy, Materials, & Processes
Division
John Weidner, Industrial Electrochemistry & Electrochemical
Engineering Division
Uwe Happek, Luminescence and Display Materials Division
Slava Rotkin, Nanocarbons Division
James Burgess, Organic and Biological Electrochemistry Division
Andrew Hillier, Physical and Analytical Electrochemistry Division
Ajit Khosla, Sensor Division




Division Officers

 **Battery**
Marca Doeff, *Chair*
Y. Shirley Ming, *Vice Chair*
Brett Lucht, *Secretary*
Jie Xiao, *Treasurer*

 **Corrosion**
Masayuki Itagaki, *Chair*
James Noël, *Vice Chair*
Dev Chidambaram, *Secretary/Treasurer*


 **Dielectric Science & Technology**
Vimal Chaitanya, *Chair*
Peter Mascher, *Vice Chair*
Uros Cvelbar, *Secretary*
Zhi David Chen, *Treasurer*

 **Electrodeposition**
Stanko Brankovic, *Chair*
Philippe Vereecken, *Vice Chair*
Natasa Vasiljevic, *Secretary*
Luca Magagnin, *Treasurer*

 **Electronics & Photonics**
Colm O'Dwyer, *Chair*
Junichi Murota, *Vice Chair*
Robert Lynch, *2nd Vice Chair*
SooHwan Jang, *Secretary*
Yu-Lin Wang, *Treasurer*

 **Energy Technology**
Andy Herring, *Chair*
Vaidyanathan Subramanian, *Vice Chair*
William Mustain, *Secretary*
Katherine Ayers, *Treasurer*


 **High Temperature Materials**
Greg Jackson, *Chair*
Paul Gannon, *Sr. Vice Chair*
Sean Bishop, *Jr. Vice Chair*
Courtney Kreller, *Secretary/Treasurer*

 **Industrial Electrochemistry & Electrochemical Engineering**
John Staser, *Chair*
Shrisudersan Jayaraman, *Vice Chair*
Maria Inman, *Secretary/Treasurer*

 **Luminescence & Display Materials**
Mikhail Brik, *Chair*
Jakoah Brgoch, *Vice Chair*
Rong-Jun Xie, *Secretary/Treasurer*

 **Nanocarbons**
Slava Rotkin, *Chair*
Hiroshi Imahori, *Vice Chair*
Olga Boltalina, *Secretary*
R. Bruce Weisman, *Treasurer*

 **Organic & Biological Electrochemistry**
Graham Cheek, *Chair*
Diane Smith, *Vice Chair*
Sadagopan Krishnan, *Secretary/Treasurer*

 **Physical & Analytical Electrochemistry**
Alice Suroviec, *Chair*
Petr Vanýsek, *Vice Chair*
Andrew Hillier, *Secretary*
Stephen Paddison, *Treasurer*

 **Sensor**
Ajit Khosla, *Chair*
Jessica Koehne, *Vice Chair*
Larry Nagahara, *Secretary*
Praveen Sekhar, *Treasurer*

Sections

Arizona Section – Candace Kay Chan, *Chair*
Brazil Section – Ernesto Pereira, *Chair*
Canada Section – Bradley Easton, *Chair*
Chicago Section – Alan Zdunek, *Chair*
Chile Section – Jose H. Zagal, *Chair*
China Section – Yong Yao Xia, *Chair*
Cleveland Section – Heidi B. Martin, *Chair*
Detroit Section – Dennis Corrigan, *Chair*
Europe Section – Renata Solarski, *Chair*
Georgia Section – Seung Woo Lee, *Chair*
India Section – Vijayamohan K. Pillai, *Chair*
Israel Section – Daniel Mandler, *Chair*

Japan Section – Masayoshi Watanabe, *Chair*
Korea Section – Won-Sub Yoon, *Chair*
Mexico Section – Felipe J. Gonzalez Bravo, *Chair*
National Capital Section – Eric D. Wachsman, *Chair*
New England Section – Sanjeev Mukerjee, *Chair*
Pittsburgh Section – Clifford W. Walton, *Chair*
San Francisco Section – Yarik Syzdek, *Chair*
Singapore Section – Alex Yan Qingyu, *Chair*
Taiwan Section – Hsisheng Teng, *Chair*
Texas Section – Jeremy P. Meyers, *Chair*
Twin Cities Section – Vicki Gelling, *Chair*

Student Chapters

Chapter Name	Year Chartered	Faculty Advisor(s)
Aalborg University	2017	Dr. Daniel-Ioan Stroe Dr. Maciej Swierczynski
Ankara Yıldırım Beyazıt University	2018	Prof. Begum Unveroglu
Atlanta Student Chapter at Georgia Tech	2008	Prof. Peter J. Hesketh
Atlantic Canada Student Chapter (Dalhousie)	2018	Prof. Mark Obrovac Dr. Jeff Dahn Prof. Heather Andreas
Auburn University	2007	Prof. Majid Beidaghi
Belgium Student Chapter	2015	Dr. Philippe M. Vereecken Prof. Dr. Stefan De Gendt
Boston Student Chapter	2009	Dr. Eugene Smotkin
British Columbia University	2013	Dr. Dan Bizzotto
Brno University of Technology	2006	Prof. Jiri Vondrak
Calgary Student Chapter	2018	Dr. Viola Birss
California State University-Fullerton	2012	Dr. John L. Haan
Case Western Reserve University	2005	Dr. Robert F. Savinell
Central Illinois Student Chapter	2008	Prof. Dr. Andrzej Wieckowski
China Spallation Neutron Source	2018	Prof. Fongwei Wang Prof. Wang Hay (Jack) Kan Dr. Bao-Tian Wang Dr. Hua Yang
Clemson University	2014	Dr. Stephen E. Creager
Colorado School of Mines	2012	Prof. Andy M. Herring
Complutense University of Madrid	2018	Prof. Dr. Nazario Martin Leon Prof. Dr. Jose Manuel Pingarron
Drexel University	2012	Prof. Dr. Yury Gogotsi Dr. Ekaterina A. Pomerantseva
Florida International University	2018	Professor Chunlei Wang
Hong Kong University of Science and Technology	2016	Prof. Dr. Francesco Ciucci Dr. Minhua Shao
Illinois Institute of Technology	2015	Wei Chen Dr. Adam Hock
Imperial College London	2018	Gregory Offer Ifan Erfyl Lester Stephens
Indiana University	2012	Dennis Peters Dr. Lane A. Baker
Kerala, India at CUSAT Student Chapter	2008	Prof. Dr. Madambi K. Jayaraj
Lahore, Pakistan Student Chapter	2008	Inam Ul Haque
Lewis University	2015	Dr. Jason Keleher
Louisiana State University	2016	Mr. Christopher G. Arges
Mexico Capitulo Estudiantil CIDETEQ	2018	Dr. Rene Antano-Lopez Jorge Morales Hernández

Chapter Name	Year Chartered	Faculty Advisor(s)
Missouri University of Science and Technology	2017	Dr. Amitava Choudhury Dr. Jay A. Switzer Dr. Manashi Nath
Montana State University	2013	Prof. Ryan W. Anderson Dr. Paul E. Gannon
Montreal Student Chapter	2010	Prof. Steen B. Schougaard
Munich Student Chapter	2015	Prof. Dr. Hubert Gasteiger
New Mexico State University	2015	Dr. Vimal H. Chaitanya Prof. Hongmei Luo
North Florida Student Chapter	2014	Dr. Pedro Moss
Norwegian University of Science and Technology	2014	Dr. Ann Mari Svensson
Ohio State University	2006	Prof. Anne C. Co
Ohio University	2011	Dr. Gerardine Gabriela Botte
Oklahoma Student Chapter	2017	Dr. Sadagopan Krishnan Dr. Barry Lavine
Rensselaer Polytechnic Institute	2013	Dr. David J. Duquette Dr. Daniel J. Lewis
Research Triangle Student Chapter	2013	Dr. Jeffrey Glass
South Brazil Student Chapter	2010	Luis F. P. Dick
SRM University	2013	Ranjit Thapa Dr. Bhalchandra Anand Kakade
Tel Aviv University	2009	Eliezer Gileadi Prof. Yosi Shacham-Diamand
Texas A&M University	2016	Dr. Yue Kuo
Tyndall National Institute	2012	Dr. Alan O'Riordan
UK Northwest Student Chapter	2015	Dr. Laurence J. Hardwick
Ulm University	2018	Prof. Dr. Werner Tillmetz
University of Alabama	2016	Prof. Shanlin Pan
University of Arkansas	2018	Rick WiseDr
University of Calgary	2011	Dr. Viola Ingrid Birss
University of California–Berkeley	2014	Prof. Bryan D McCloskey
University of California–Los Angeles	2015	Prof. Dr. Sarah H Tolbert
University of California–Riverside	2011	Prof. Alexander A. Balandin
University of California–San Diego	2014	Dr. Shirley Meng
University of Cape Town	2018	Dr. Rhiyaad Mohamed
University of Central Florida	2000	Dr. Kalpathy B. Sundaram
University of Cincinnati	2007	Marc Cahay
University of Florida	2005	Erin Patrick
University of Guelph	2018	Dr. Aicheng Chen Dr. Abdelaziz Houman Dr. Jacek Lipkowski
University of Houston	2016	Prof. Yan Yao

Chapter Name	Year Chartered	Faculty Advisor(s)
University of Illinois at Chicago	2016	Sanjay Kumar Behura Prof. Brian P. Chaplin
University of Iowa	2014	Dr. Johna Leddy
University of Kansas	2016	Trung Van Nguyen
University of Kentucky	2014	Prof. Dr. Doo Young Kim
University of Maryland	2011	Prof. Dr. Eric D. Wachsman
University of Nevada-Reno	2014	Prof. Dev Chidambaram
University of New Mexico	2017	Dr. Fernando H. Garzon Dr. Plamen B. Atanassov
University of Oxford	2016	Dr. Charles W. Monroe Dr. Kyle A. Vincent Dr. Kylie A. Vincent
University of Pittsburgh	2014	Dr. Prashant N. Kumta Spandan Maiti
University of South Carolina	2010	Prof. William Mustain
University of St. Andrews	2015	Prof. John T. S. Irvine

Chapter Name	Year Chartered	Faculty Advisor(s)
University of Tartu	2013	Kaido Tammeveski
University of Texas at Austin	2006	Dr. Arumugam Manthiram
University of Texas at Dallas	2012	Prof. Moon J Kim
University of Toronto	2016	Dr. Donald W. Kirk
University of Utah	2015	Dr. Shelley D. Minteer
University of Virginia	2006	Dr. Giovanni Zangari
University of Washington	2016	Prof. Daniel T Schwartz Dr. Venkat R. Subramanian Dr. Stuart B. Adler
University of Western Ontario	2017	Prof. Jungsook Clara Wren Dr. Zhifeng Ding Dr. James J. Noel Dr. D.W. Shoemith
Valley of the Sun (Central Arizona)	2013	Prof. Dr. Candace Kay Chan
Yamagata University	2018	Tsukasa Yoshida Hedemitsu Furukawa Ajit Khosla

MSTAT

Arbin's Bestselling Potentiostat/Galvanostat

24-bit Resolution	Bipolar Circuitry	0.1mS Time Resolution	2000 pts/s Data Logging
Current Ranges	Fully Parallelable	Aux Voltage	EIS

(-5)-5V, upto 5A
Optional 2MHz EIS

See **Arbin** at Booth # **202 & 204** to learn more.

Technology for a Better Tomorrow

We live in a world that grows ever more advanced thanks to technological innovation. In five business segments, the Sumitomo Electric Group is contributing to this trend:

- Safer, more comfortable, more eco-friendly cars
- Higher capacity infocommunication networks
- Electronic devices with greater functionality
- Stable supplies of electricity from renewable sources
- Advanced materials used in industries and households

Every day, we strive to develop technology that enriches society. This is our mission at the Sumitomo Electric Group.

<http://global-sei.com>

Committees and Subcommittees 2018/2019

Executive Committee of the Board of Directors			Term
Yue Kuo	Chair		Spring 2019
Christina Bock	Member		Spring 2020
Stefan De Gendt	Member		Spring 2021
Eric Wachsman	Member		Spring 2022
James Fenton	Member		Spring 2020
Gessie Brisard	Member		Spring 2022
Christopher Jannuzzi	Member	Executive Director	Term as ED

Board of Directors, Nonprofit Financial Professional			Term
Stuart Swirson	Member		Spring 2019

Audit Committee			Term
Johna Leddy	Chair	Immediate Past President	Spring 2019
Yue Kuo	Member	President	Spring 2019
Christina Bock	Member	Senior Vice President	Spring 2019
Gessie Brisard	Member	Treasurer	Spring 2022
Stuart Swirson	Member	Nonprofit Financial Professional	Spring 2019

Education Committee			Term
James Noël	Chair		Spring 2021
Anne Co	Member		Spring 2019
Enn Lust	Member		Spring 2019
Kalpathy Sundaram	Member		Spring 2020
Alice Surovic	Member		Spring 2020
Keryn Lian	Member		Spring 2021
David Hall	Member		Spring 2021
Vimal Chaitanya	Member		Spring 2022
Takayuki Homma	Member		Spring 2022
Daniel Parr	Student Member		Spring 2019
Margaret Calhoun	Student Member		Spring 2020
James Fenton	Member	Secretary	Spring 2020
William Mustain	Member	Chair, Individual Membership Committee	Spring 2020

Ethical Standards Committee			Term
Johna Leddy	Chair	Immediate Past President	Spring 2019
Dennis Hess	Member	Past Officer	Spring 2019
D. Noel Buckley	Member	Past Officer	Spring 2020
James Fenton	Member	Secretary	Spring 2020
Gessie Brisard	Member	Treasurer	Spring 2022

Finance Committee			Term
Gessie Brisard	Chair	Treasurer	Spring 2022
Robert Mantz	Member		Spring 2019
Mark Verbrugge	Member		Spring 2019
Robert KostECKI	Member		Spring 2020
Boryann Liaw	Member		Spring 2020
James Fenton	Member	Secretary	Spring 2020
Tim Gamberzky	Member	Chief Operating Officer	Term as COO

Honors and Awards Committee			Term
Peter Fedkiw	Chair - ETD		Spring 2019
Joseph Stetter	Member - SENS		Spring 2019
Rohan Akolkar	Member - ELDP		Spring 2019
R. Bruce Weisman	Member - NANO		Spring 2019
Vimal Chaitanya	Member - DST		Spring 2020
Thomas Moffat	Member - ELDP		Spring 2020
Jean St-Pierre	Member - ETD		Spring 2020
Viola Birss	Member - PAED		Spring 2021
Shelley Minter	Member - PAED		Spring 2021
Scott Calabrese Barton	Member - ETD		Spring 2021
Junichi Murota	Member - EPD		Spring 2022
Dev Chidambaram	Member - CORR		Spring 2022
Wei Tong	Member - BATT		Spring 2022
Yue Kuo	Member - EPD	President	Spring 2019

Individual Membership Committee			Term
William Mustain	Chair		Spring 2020
Steven Policastro	Member		Spring 2019
M. Neal Golovin	Member		Spring 2019
R. Bruce Weisman	Member		Spring 2020
Timothy Paschkewitz	Member		Spring 2020
Toshiyuki Nohira	Member		Spring 2021
Chi-Chang Hu	Member		Spring 2021
Beatriz Molero Sanchez	Student Member		Spring 2019
Jeffrey Henderson	Student Member		Spring 2020
Marion Jones	Member	Chair, Sponsorship Committee	Spring 2019
James Fenton	Member	Secretary	Spring 2020

Nominating Committee			Term
Johna Leddy	Chair	Immediate Past President	Spring 2019
Alice Surovic	Member		Spring 2019
Hariklia Deligianni	Member		Spring 2019
Dennis Hess	Member		Spring 2019
Eric Wachsman	Member	Third Vice President	Spring 2019

Committees and Subcommittees 2018/2019

Sponsorship Committee		Term
Marion Jones	Chair	Spring 2019
Robert Mantz	Member	Spring 2019
Khalil Amine	Member	Spring 2019
Mindy Zhang	Member	Spring 2019
Chuck Hussey	Member	Spring 2020
Peter Fedkiw	Member	Spring 2020
Xiaoping Jiang	Member	Spring 2020
Jie Xiao	Member	Spring 2021
Christopher Beasley	Member	Spring 2021
Mark Glick	Member	Spring 2021
William Mustain	Member	Chair, Individual Membership Committee
Gessie Brisard	Member	Treasurer

Technical Affairs Committee		Term
Christina Bock	Chair	Senior Vice President
Yue Kuo	Member	President
Johna Leddy	Member	Immediate Past President
Krishnan Rajeshwar	Member	Second Immediate Past President
Eric Wachsman	Member	Chair, Meetings Subcommittee
Stefan De Gendt	Member	Chair, Publications Subcommittee
E. Jennings Taylor	Member	Chair, Interdis. Sci. & Tech. Subcom.
Christopher Jannuzzi	Member	Executive Director

Publications Subcommittee of the Technical Affairs Committee		Term
Stefan De Gendt	Chair	Second Vice President
Eric Wachsman	Vice Chair	Third Vice President
Robert Savinell	Member	JES Editor
Jeffrey Fergus	Member	<i>ECS Transactions</i> Editor
Krishnan Rajeshwar	Member	JSS Editor
Robert Kelly	Member	<i>Interface</i> Editor
D. Noel Buckley	Member	
Scott Calabrese Barton	Member	
Elizabeth Biddinger	Member	
Christina Roth	Member	

Meetings Subcommittee of the Technical Affairs Committee		Term
Eric Wachsman	Chair	Third Vice President
Stefan De Gendt	Vice Chair	Second Vice President
Boryann Liaw	Member	
Thomas Moffat	Member	
Thomas Schmidt	Member	

Interdisciplinary Science and Technology Subcommittee of the Technical Affairs Committee		Term
E. Jennings Taylor	Chair - IEEE	Spring 2019
Martin Winter	Member - BATT	Spring 2019
Douglas Hansen	Member - CORR	Spring 2019
John Stickney	Member - ELDP	Spring 2019
Richard Martel	Member - NANO	Spring 2019
Shelley Minter	Member - PAED	Spring 2020
Peter Mascher	Member - DST	Spring 2020
Andrew Hoff	Member - EPD	Spring 2020
Katherine Ayers	Member - ETD	Spring 2020
Alok Srivastava	Member - LDM	Spring 2021
Diane Smith	Member - OBE	Spring 2021
Jessica Koehne	Member - SENS	Spring 2021
Juan Peralta Hernandez	Member - IEEE	Spring 2021

Symposium Planning Advisory Board of the Technical Affairs Committee		Term
Eric Wachsman	Chair	Third Vice President
Colm O'Dwyer	Member	EPD Division Chair
Andy Herring	Member	ETD Division Chair
Graham Cheek	Member	OBE Division Chair
Alice Surovic	Member	PAED Division Chair
Stanko Brankovic	Member	ELDP Division Chair
Greg Jackson	Member	H- TEMP Division Chair
Mikhail Brik	Member	LDM Division Chair
Vimal Chaitanya	Member	DST Division Chair
Slava Rotkin	Member	NANO Division Chair
John Staser	Member	IE&EE Division Chair
Marca Doeff	Member	BATT Division Chair
Masayuki Itagaki	Member	CORR Division Chair
Ajit Khosla	Member	SENS Division Chair
E. Jennings Taylor	Member	ISTS Subcommittee Chair

Society Historian	Term
Zoltan Nagy	Spring 2019

American Association for the Advancement of Science	Term
Christopher Jannuzzi	Executive Director

Science History Institute	Term
Yury Gogotsi	Heritage Councilor

National Inventors Hall of Fame	Term
Peter Fedkiw	Chair, Honors & Awards Committee

External Relations Representative	Term
Mark Orazem	Spring 2019



Get Involved with ECS

Founded in 1902, ECS is led by scientists, for scientists. ECS advances electrochemistry and solid state science and technology by publishing peer-reviewed scholarly journals, convening scientific meetings, and supporting emerging scientists in our fields.

Free the Science is ECS's initiative to move toward a future that embraces open science to further advance research in our fields. This is a long-term vision for transformative change in the traditional models of communicating scholarly research.

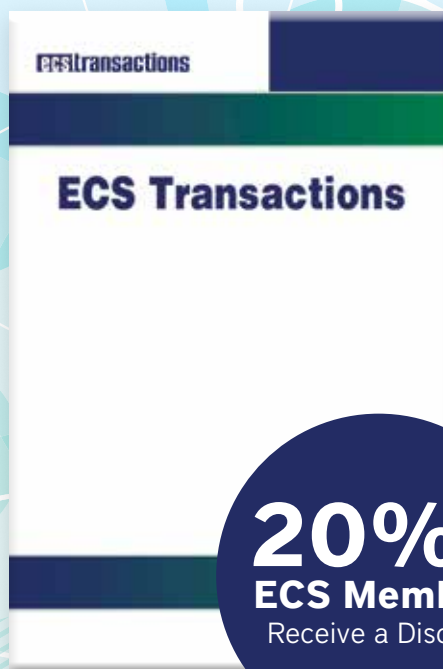


NOW AVAILABLE

Volume 89 – Dallas, Texas

from the 235th ECS Meeting, May 26 – 30, 2019

- Vol. 89 Large Scale Energy Storage 10
No. 1 CD or USB.....\$126.00 PDF.....\$114.77
- Vol. 89 Battery Safety and Failure Modes
No. 2 CD or USB.....\$105.00 PDF.....\$90.00
- Vol. 89 Silicon Compatible Emerging Materials, Processes, and
No. 3 Technologies for Advanced CMOS and Post-CMOS Applications 9
CD or USB.....\$105.00 PDF.....\$90.00
- Vol. 89 Processes at the Semiconductor Solution Interface 8
No. 4 CD or USB.....\$95.00 PDF.....\$74.63
- Vol. 89 Wide Bandgap Semiconductor Materials and Devices 20
No. 5 CD or USB.....\$98.00 PDF.....\$77.85
- Vol. 89 Solid-state Electronics and Photonics in Biology
No. 6 and Medicine 6
CD or USB.....\$118.00 PDF.....\$102.57
- Vol. 89 Sustainable Materials and Manufacturing 3
No. 7 CD or USB.....\$68.00 PDF.....\$48.13



About ECS Transactions: *ECS Transactions* is the official conference proceedings publication of The Electrochemical Society. Featuring full-text content of proceedings from ECS meetings and ECS-sponsored meetings, ECST is a high-quality venue for authors and an excellent resource for researchers.

WWW.ELECTROCHEM.ORG/ONLINE-STORE

Publish Your Next Conference Proceedings with ECST

Did you know ECST offers publication services for ECS-sponsored and outside meetings?

ECS Transactions is a high-quality venue for authors and an excellent platform to publish the proceedings from your next meeting! Conference proceedings make it easy to disseminate meeting content beyond your attendees. Here's why you should be interested in publishing your next meeting's proceedings in ECST:

Rapid Publication: ECST can publish your proceedings as early as two weeks after reviews have been completed. From submission to publication, the process takes only about two and a half months.

Enhance Your Meeting: ECST offers the option of publishing your proceedings either before or after your meeting takes place. Proceedings papers that are available at the meeting are particularly useful since they provide information to strengthen and complement the discussions at your meeting.

Visibility and Discoverability: *ECS Transactions* is indexed by most major services, including the Web of Science Conference Proceedings Citation Index, SciFinder, Scopus, and Google Scholar.

Flexibility: ECST staff will work with you to set a publication and review schedule that best suits your needs. Publishing with ECST allows you to maintain full editorial control of your content.

A Variety of Formats: *ECS Transactions* offers the option of digital-only (PDF) or CD/USB editions of your proceedings. ECS is also partnered with Curran Associates, a company that provides print-on-demand softcover editions of all ECST content.

ECST@ELECTROCHEM.ORG



Journal of The Electrochemical Society

FOCUS ISSUES • 2020 VOLUME

Accepting Submissions

- Mathematical Modeling of Electrochemical Systems at Multiple Scales in Honor of Richard Alkire

Upcoming

- Sensor Reviews
- Heterogeneous Functional Materials for Energy Conversion and Storage
- Batteries, Dedicated to Michel Armand
- Battery Reliability and Safety, Design, and Mitigation



AVAILABLE TO READ

Partial Issues

- Mathematical Modeling of Electrochemical Systems at Multiple Scales in Honor of Richard Alkire
- 4D Materials and Systems
- Advanced Techniques in Corrosion Science in Memory of Hugh Isaacs

Full Issues

- Advances in Electrochemical Processes for Interconnect Fabrication in Integrated Circuits
- Selected Papers from IMLB 2018
- Semiconductor Electrochemistry and Photoelectrochemistry in Honor of Krishnan Rajeshwar
- Advances and Perspectives on Modern Polymer Electrolyte Fuel Cells in Honor of Shimshon Gottesfeld

ABOUT FOCUS ISSUES

ECS publishes focus issues in order to highlight scientific and technological areas of current interest and future promise that are expanding rapidly or have taken a new direction. Contact ECS if you are interested in any of the focus issues listed above, or if you would like to propose a future focus issue.

LEARN MORE

For submission deadlines and additional information, visit www.electrochem.org/focusissues
publications@electrochem.org

Corporate Opportunities

ECS provides unique programs to help your organization gain exposure to our community of engineers and scientists!

Options include:

- ✓ Exhibiting opportunities-get in front of decision makers
- ✓ General meeting sponsorships-highlight your brand
- ✓ Symposium sponsorships-support the scientists behind the research
- ✓ Institutional Membership-create a mutually beneficial partnership with ECS
- ✓ Print & Digital Advertising-promote your products and services



sponsorship@electrochem.org

**CAREER
E·X·P·O**

235th ECS Meeting

Dallas, TX

May 27-29, 2019

2019



Featuring:

*Professional Development Services
Continuing Education
Recruitment/Employment Opportunities*

Monday..... 1800-2000h

Tuesday and Wednesday 1400-2000h

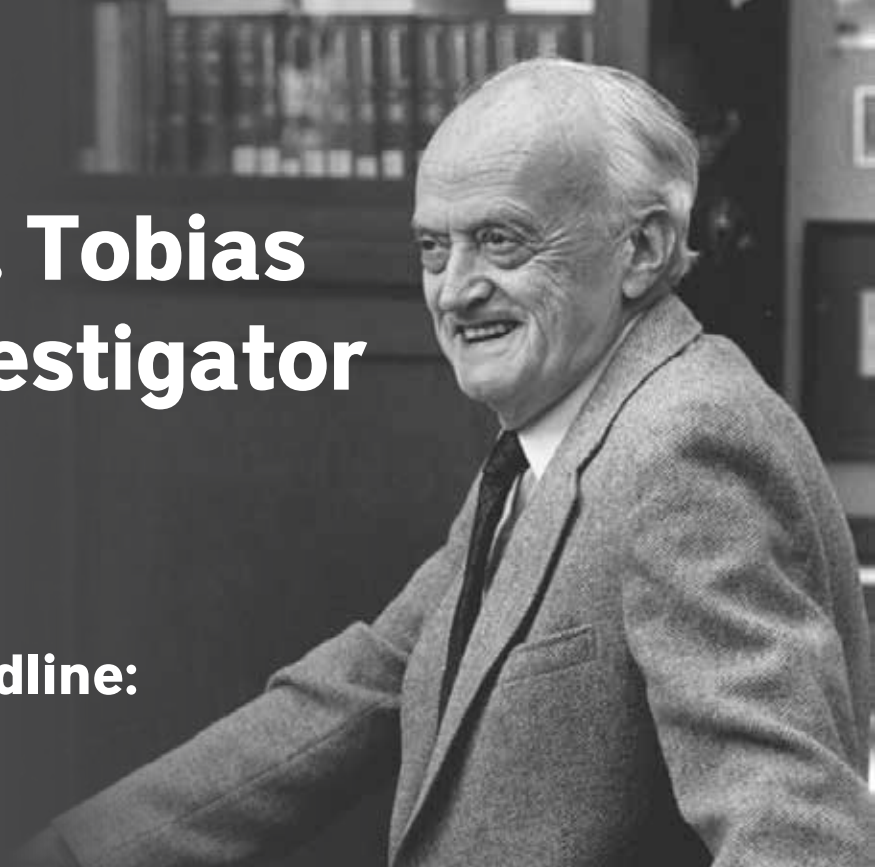
Lone Star B/C, Booth EX100 (SCC)

Contact Shannon.Reed@electrochem.org

**Charles W. Tobias
Young Investigator
Award**

**Nomination Deadline:
October 1, 2019**

www.electrochem.org/young-investigator-award





ECS Journal of Solid State Science and Technology

FOCUS ISSUES • UPCOMING

Accepting Submissions

- Recent Advances in Wide Bandgap III-Nitride Devices and Solid State Lighting: A Tribute to Isamu Akasaki

Partial Issues Available to Read

- Chemical Mechanical Planarization for Sub 10-nm Technologies
- Gallium Oxide Based Materials and Devices



AVAILABLE TO READ

Recent Issues

- Visible and Infrared Phosphor Research and Applications
- Semiconductor-Based Sensors for Application to Vapors, Chemicals, Biological Species, and Medical Diagnosis

Past Issues

- Ultrawide Bandgap Materials and Devices
- Thermoelectric Materials & Devices: Phonon Engineering, Advanced Materials and Thermal Transport
- Nanocarbons – in Memory of Sir Harry Kroto
- GaN-Based Electronics for Power, RF, and Rad-Hard Applications

ABOUT FOCUS ISSUES

ECS publishes focus issues in order to highlight scientific and technological areas of current interest and future promise that are expanding rapidly or have taken a new direction. Contact ECS if you are interested in any of the focus issues listed above, or if you would like to propose a future focus issue.

LEARN MORE

For submission deadlines and additional information, visit www.electrochem.org/focusissues or email publications@electrochem.org

MAXIMIZE YOUR MEMBERSHIP

1 Activate your Membership



2 Log on to electrochem.org and explore



3 Update your My Account member profile



5 Join the discussion on the ECSBlog.org



4 Get connected with other members in our Membership Directory



6 Explore professional development and educational opportunities



8 Publish your research with ECS



7 Attend an ECS Meeting



10 Volunteer to serve on a committee or section



9 Contribute to *#FreethScience*



11 Renew your Membership!



236th ECS Meeting



Atlanta, GA

October 13-17, 2019

Hilton Atlanta

featuring

The Electrochemical Society



**electrochemical energy
summit 2019**

Electrochemistry in Space

Travel Grant application deadline – July 1
Exhibit and sponsorship deadline – August 2
Early registration deadline – September 9

www.electrochem.org/236

INCREASE THE REACH OF YOUR RESEARCH

ECS TRANSACTIONS

PUBLICATION SERVICES TO ENHANCE YOUR MEETING

ECS's conference proceedings publication, *ECS Transactions*, is a high-quality venue for authors and an excellent platform to publish the proceedings from your next meeting! Conference proceedings make it easy to disseminate meeting content beyond your attendees. Publishing with ECST is a fast and affordable way to increase the reach of the valuable research presented at your event.

RAPID PUBLICATION

Publish your proceedings as early as two weeks after reviews have been completed. From submission to publication, the process only takes about two and a half months.

FLEXIBILITY

ECS staff will work with you to set a publication and review schedule that best suits your needs. Publishing with ECST allows you to maintain full editorial control of your content.

VISIBILITY

ECS Transactions is indexed by most major services, including the Web of Science Conference Proceedings Citation Index, SciFinder, Scopus, and Google Scholar.

A VARIETY OF FORMATS

Provide your attendees with digital (PDF) or CD/USB editions of your proceedings. ECS is also partnered with proceedings.com to offer print-on-demand softcover editions of all ECST content.

ECS IN THE OPEN

ECS's open access program has grown exponentially since we began this offering in 2014. Since then, over 35% of our journal articles have been published as open access, for a total of more than 3,000 open articles.



Find out more about what ECS is doing to support open access.



Discount Opportunities

More than **3,000** ECS journal articles have been published as open. Over **90%** of the fees for publishing this content were paid for directly by ECS. Altogether, ECS has covered over **\$2.1M** in article processing charges.



Preprints

We believe that preprints are a vital mechanism for information sharing, and support them as an integral part of the open science ecosystem. ECS's newest offering, **ECSarXiv**, adds to the collection of more than **2.2 million** preprints searchable through the Center for Open Science's OSF Preprints.



Green Open Access

ECS allows authors to self-archive their work with **no embargo**, allowing all authors to **immediately and freely** share their work.



Free the Science

ECS is committed to eliminating barriers for authors who want to read and publish peer reviewed, high-quality content for free. **Free the Science** is ECS's initiative to provide universal access to knowledge to anyone with an internet connection. Learn more at www.freethescience.org.

www.electrochem.org/oa



ECSarXiv

**ENHANCE THE DISCOVERY AND
IMPACT OF YOUR RESEARCH**

www.ecsarxiv.org

ECSarXiv is a free online service for preprints and other preliminary communications not yet published in a peer-reviewed outlet, which facilitates the rapid exchange of ideas in electrochemistry and solid state science and technology. ECSarXiv is part of a more comprehensive, transparent, and complete ecosystem of scholarly communication, enabling faster dissemination of new knowledge and techniques. **By submitting research to ECSarXiv, you immediately make your work:**



01 VISIBLE

Publishing a paper in a peer-reviewed journal can take months, whereas submissions to ECSarXiv are made immediately available after a brief moderation period. Plus, all research shared in ECSarXiv is automatically indexed by Google Scholar, Altmetric, and a number of other open access databases.



02 OPEN

Preprints are a vital mechanism for the free sharing of information, and a vital part of the open science ecosystem. All preprints submitted to ECSarXiv are made publicly and freely available, and are published with an open license of the authors' choosing. ECSarXiv adds to a collection of more than 2.2 million preprints freely available through the Center for Open Science's OSF Preprints.



03 CITABLE

Because all ECSarXiv submissions receive a free DOI, preprints allow for easily citable documentation of preliminary results. Preprints can continue to benefit their authors even after the research is published in a peer-reviewed article – across all scientific disciplines, papers available for free with a preprint are cited 30% more often than the world average.

04 SECURE

Although scooping is an issue that gets a lot of attention in discussions about preprints, posting in most preprint services, like ECSarXiv, can actually preclude scooping. All preprints submitted to ECSarXiv are timestamped and provided with a free DOI, both of which help in establishing priority of discoveries.

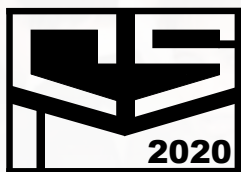
237th ECS Meeting



MONTRÉAL, Canada

May 10-15, 2020

Palais des Congrès Montréal



featuring
**The 18th International Meeting
on Chemical Sensors (IMCS 2020)**

Abstract submission opens in July



Discoveries need discoverability.

Find out more about how ECS Author Choice Open Access
can accelerate the impact of your research.

www.electrochem.org/oa

6 Ways to Give to ECS

1
In Person
at an
ECS meeting

2
Online at
Electrochem.org

3
Mail to
65 S Main St.,
Bldg. D
Pennington,
NJ 08534

4
Securities/
Stock

5
Planned
Giving

6
Automatic
Recurring
Gifts

Visit www.electrochem.org and click the red **DONATE** button.
Contact development@electrochem.org

**Research is meant to be shared.
Make a donation today!**

**#FREE
THE
SCIENCE™**



Visit freethescience.org

A — Batteries and Energy Storage

- A01 — **Battery and Energy Technology Joint General Session**
Mani Manivannan, Jie Xiao, Hui Xu, S. R. Narayan
Energy Technology, Battery
- A02 — **Lithium Ion Batteries and Beyond**
Brett Lucht, Bryan McCloskey, Guoying Chen, Christopher Johnson, Pawel Kulesza
Battery, Physical and Analytical Electrochemistry
- A03 — **Large Scale Energy Storage 10**
ACS Trung Nguyen, Jagjit Nanda, Bin Li, Jing Xu, Wei Wang, Pawel Kulesza, Shelley Minter
Energy Technology, Battery, Industrial Electrochemistry and Electrochemical Engineering, Physical and Analytical Electrochemistry, Battery, Physical and Analytical Electrochemistry
- A04 — **Battery Student Slam 3**
Feng Lin, David Mitlin, Laurence Hardwick, Veronica Augustyn, Guoying Chen, Susan Odom
Battery Electrochemical Engineering
- A05 — **Battery Characterization**
Gabriel Veith, Thomas Barrera, Roseanne Warren, Jun Lu, Gary Koenig, Anne Co
Battery, Physical and Analytical Electrochemistry
- A06 — **Battery Safety and Failure Modes**
ACS Thomas Barrera, Guangsheng Zhang, Boryann Liaw, Ankur Jain
Battery, Industrial Electrochemistry and Electrochemical Engineering
- B — **Carbon Nanostructures and Devices**
- B01 — **Carbon Nanostructures for Energy Conversion and Storage**
Jeffrey Blackburn, Michael Arnold, Stephen Doorn, David Cliffl, Christina Bock, Xiulei Ji, MinKyu Song, Vito Di Noto, Plamen Atanasov
Nanocarbons, Battery, Physical and Analytical Electrochemistry
- B02 — **Carbon Nanostructures in Medicine and Biology**
Daniel Heller, Tatiana DaRos, Fotios Papadimitrakopoulos, Ardemis Boghossian, Mekki Bayachou, James Burgess, Larry Nagahara
Nanocarbons, Organic and Biological Electrochemistry, Sensor
- B03 — **Carbon Nanotubes – From Fundamentals to Devices**
Stephen Doorn, Yury Gogotsi, Pawel Kulesza, Ming Zheng, Slava V. Rotkin, R. Bruce Weisman, Shigeo Maruyama, Benjamin Flavel, Yan Li
Nanocarbons, Physical and Analytical Electrochemistry
- B04 — **Nano in Latin America**
Hiroshi Imahori, Mariana Martinez-Pacheco, Slava Rotkin, Juan Lale, Monica Cerro-Lopez, Gaaan Alvarez-Romero
Nanocarbons, Dielectric Science and Technology, Electronics and Photonics
- B05 — **Fullerenes – Endohedral Fullerenes and Molecular Carbon**
Shangfeng Yang, Alan Balch, Francis D'Souza, Luis Echegoyen, Dirk Guldi, Nazario Martin, Steven Stevenson
Nanocarbons
- B06 — **2D Layered Materials from Fundamental Science to Applications**
Jessica Koehne, David Estrada, Ajit Khosla, Yaw Obeng, Stefan De Gendt, Zia Karim, Colm O'Dwyer, Slava V. Rotkin
Nanocarbons, Dielectric Science and Technology, Electronics and Photonics, Sensor, Interdisciplinary Science and Technology Subcommittee
- B07 — **Light Energy Conversion with Metal Halide Perovskites, Semiconductor Nanostructures, and Inorganic/Organic Hybrid Materials**
Hiroshi Imahori, Prashant Kamat, Kei Murakoshi, Tsukasa Torimoto, Vito Di Noto
Nanocarbons, Physical and Analytical Electrochemistry

B08 — **Porphyryns, Phthalocyanines, and Supramolecular Assemblies**
Karl Kadish, Roberto Paolesse, Tomas Torres, Nathalie Solladie, Diane Smith, Norbert Jux
Nanocarbons, Organic and Biological Electrochemistry

B09 — **Nano for Industry**
Slava V. Rotkin, Luke Haverhals, Francis D'Souza, E. Taylor, Oana Leonte
Nanocarbons, Industrial Electrochemistry and Electrochemical Engineering, Physical and Analytical Electrochemistry, Dielectric Science and Technology, Interdisciplinary Science and Technology Subcommittee

C — Corrosion Science and Technology

C01 — **Corrosion General Session**
Masayuki Itagaki, Jamie Noél
Corrosion

D — Dielectric Science and Materials

D01 — **Chemical Mechanical Polishing 15**
Gautam Banerjee, R. Rhoades, G. Bahar Basim, V. Chaitanya, Yaw Obeng
Dielectric Science and Technology

E — Electrochemical/Electroless Deposition

E01 — **Electrodeposition for Advanced Node Interconnect Metallization Beyond Copper**
Shafaat Ahmed, Jian Zhou, Qiang Huang, James Kelly
Electrodeposition

F — Electrochemical Engineering

F01 — **Industrial Electrochemistry and Electrochemical Engineering General Session**
Douglas Riemer, John Staser
Industrial Electrochemistry and Electrochemical Engineering

F02 — **Tutorial on Industrial Electrochemistry**
Gerardine Botte, John Harb, E. Taylor
Industrial Electrochemistry and Electrochemical Engineering

F03 — **Characterization of Porous Materials 8**
John Staser, Xiaolin Li, Christina Bock
Industrial Electrochemistry and Electrochemical Engineering, Battery, Energy Technology

F04 — **Multiscale Modeling, Simulation and Design 3: Enhancing Understanding, and Extracting Knowledge from Data**
Venkat Subramanian, Scott Calabrese Barton, John Harb, Luis Diaz, Gerardine Botte, Ankur Jain
Industrial Electrochemistry and Electrochemical Engineering, Energy Technology

G — Electronic Materials and Processing

G01 — **Silicon Compatible Materials, Processes, and Technologies for Advanced Integrated Circuits and Emerging Applications 8**
ACS Fred Roozeboom, Paul Timans, Evgeni Gusev, Zia Karim, Stefan De Gendt, Hemanth Jagannathan, Kuniyuki Kakushima
Electronics and Photonics, Dielectric Science and Technology

G02 — **Processes at the Semiconductor Solution Interface 8**
ACS Colm O'Dwyer, D. Buckley, Arnaud Etcheberry, Andrew Hillier, Robert Lynch, Philippe Vereecken, Heli Wang, Vidhya Chakrapani
Electronics and Photonics, Dielectric Science and Technology, Electrodeposition, Physical and Analytical Electrochemistry

G03 — **Organic Semiconductor Materials, Devices, and Processing 7**
M. Deen, David Gundlach, Benjamin Iniguez, Hagen Klauk
Electronics and Photonics

H — Electronic and Photonic Devices and Systems

H01 — Wide Bandgap Semiconductor Materials and Devices 20

ACS Soohwan Jang, Travis Anderson, Jennifer Hite, Erica Douglas, Vidhya Chakrapani, John Zavada
Electronics and Photonics

H02 — Solid-state Electronics and Photonics in Biology and Medicine 6

ACS Yu-Lin Wang, Wenzhuo Wu, Toshiya Sakata, Zong-Hong Lin, Andrew Hoff, Chih-Ting Lin, Lluís Marsal, M. Deen, Zoraida Aguilar
Electronics and Photonics, Sensor

H03 — Wearable and Flexible Electronic and Photonic Technologies 2

Colm O'Dwyer, Jessica Koehne, Ajit Khosla, Wei Gao, Durgamadhhab Misra, Shelley Minter, Lain-Jong Li, Yu-Lun Chueh, Sheng Xu, Jong-Hyun Ahn, Sang-Woo Kim
Electronics and Photonics, Dielectric Science and Technology, Physical and Analytical Electrochemistry, Sensor, Interdisciplinary Science and Technology Subcommittee

I — Fuel Cells, Electrolyzers, and Energy Conversion

I01 — Hydrogen or Oxygen Evolution Catalysis for Water Electrolysis 5

Hui Xu, Pawel Kulesza, Sanjeev Mukerjee, Nemanja Danilovic, John Weidner, Vivek Murthi
Energy Technology, Industrial Electrochemistry and Electrochemical Engineering, Physical and Analytical Electrochemistry

I02 — Materials for Low Temperature Electrochemical Systems 5

Minhua Shao, Prashant Kumta, Gang Wu, Svitlana Pylypenko, William Mustain
Energy Technology, Physical and Analytical Electrochemistry

I03 — Renewable Fuels via Artificial Photosynthesis or Heterocatalysis 4

Nianqiang Wu, Pawel Kulesza, Mani Manivannan, Frank Osterloh, Hui Xu, Eric Miller, Bunsho Ohtani, Vaidyanathan Subramanian, Jae Joon Lee, Jihui Yang, Krishnan Rajeshwar
Energy Technology, Sensor

I04 — Energy Conversion Systems Based on Nitrogen 2

Julie Renner, Gang Wu, Yuyan Shao, Hui Xu, Shelley Minter, Lauren Greenlee
Energy Technology, Physical and Analytical Electrochemistry

I05 — Heterogeneous Functional Materials for Energy Conversion and Storage 2

Wilson Chiu, Fanglin Chen, Deryn Chu, Srikanth Gopalan, Torsten Markus, Patrick Masset, Robert Mantz, Steven DeCaluwe, Vito Di Noto, Nian Liu, Andrew Herring
High-Temperature Energy, Materials, & Processes, Battery, Energy Technology, Physical and Analytical Electrochemistry

I06 — An Invited Symposium on Advances and Perspectives on Modern Polymer Electrolyte Fuel Cells – In Honor of Shimshon Gottesfeld

ACS Bryan Pivovar, Yushan Yan, Piotr Zelenay, Thomas Zawodzinski, Huyen Dinh, Gang Wu, Rod Borup, Adam Weber, Peter Pintauro, Hui Xu
Energy Technology, Industrial Electrochemistry and Electrochemical Engineering, Physical and Analytical Electrochemistry

K — Organic and Bioelectrochemistry

K01 — Bioelectrochemistry: From Nature-Inspired Electrochemical Systems to Electrochemical Biosensors

Graham Cheek, Mekki Bayachou
Organic and Biological Electrochemistry, Energy Technology, Physical and Analytical Electrochemistry, Sensor

K02 — Electron-Transfer Activation in Organic and Biological Systems

Graham Cheek, Shelley Minter
Organic and Biological Electrochemistry, Energy Technology, Physical and Analytical Electrochemistry, Sensor

K03 — Young Investigators in Organic and Biological Electrochemistry

Graham Cheek, Sadagopan Krishnan, Alice Suroviec
Organic and Biological Electrochemistry, Physical and Analytical Electrochemistry

L — Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry

L01 — Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry General Session and Grahame Award Symposium

Alice Suroviec, Svitlana Pylypenko, Anne Co
Physical and Analytical Electrochemistry

L02 — Impedance Technologies, Diagnostics, and Sensing Applications 5

Petr Vanýsek, Andrew Hillier
Physical and Analytical Electrochemistry

L03 — Computational Electrochemistry 5

Stephen Paddison, Iryna Zenyuk, Scott Calabrese Barton
Physical and Analytical Electrochemistry, Energy Technology, Industrial Electrochemistry and Electrochemical Engineering

L04 — Polyoxometallates and Nanostructured Metal Oxides in Efficient Electrocatalysis, Energy Conversion, and Charge Storage

Pawel Kulesza, Andrew Herring, Vito Di Noto, Iwona Rutkowska
Physical and Analytical Electrochemistry, Energy Technology

L06 — Nanoporous Materials

Roseanne Warren, Anne Co, Bo Zhang, Kunal Karan
Physical and Analytical Electrochemistry, Energy Technology

M — Sensors

M01 — Sensors, Actuators, and Microsystems General Session

Larry Nagahara, Gary Hunter, Peter Hesketh, Aleksandr Simonian, Bryan Chin, Jessica Koehne, Mike Carter
Sensor

M02 — Semiconductor Electrochemistry and Photoelectrochemistry in Honor of Krishnan Rajeshwar – An Invited Symposium

Nianqiang Wu, Scott Calabrese Barton, Pawel Kulesza, Csaba Janáky, Heli Wang, Vaidyanathan Subramanian, Kohei Uosaki, Prashant Kamat, Mani Manivannan
Energy Technology, Physical and Analytical Electrochemistry, Sensor

M03 — Sensors for Precision Medicine

Praveen Sekhar, Nianqiang Wu, Yuehe Lin, Ajit Khosla, Pengyu Chen, Jessica Koehne, Leyla Soleymani
Sensor

Z — General Topics

Z01 — General Student Poster Session

Venkat Subramanian, Kalpathy Sundaram, Vimal Chaitanya, P. Pharkya, Alice Suroviec
All Divisions

Z02 — Sustainable Materials and Manufacturing 3

ACS Gerardine Botte, Gautam Banerjee, John Harb, Nianqiang Wu, S. R. Narayan, E. Taylor, Arumugam Manthiram, John Stickney, Katherine Ayers, Gregory Jackson
All Divisions, Interdisciplinary Science and Technology Subcommittee

Z03 — Nanoscale Electrochemical Imaging and Detection

Petr Vanýsek, Tomokazu Matsue, Nongjian Tao, David Cliffl
All Divisions, International Society of Electrochemistry (ISE)

Select symposia will publish their proceedings in an issue of *ECS Transactions* **ACS**. Issues will be available for sale in CD, USB, and electronic (PDF) formats. Preordered CD or USB editions will be available for pickup at the meeting.

235th ECS Meeting • May 26-30, 2019 • Dallas, TX

		Sunday, May 26		Monday, May 27	
Code	Symposium	AM	PM	AM	PM
A01	Battery and Energy Technology Joint General Session <i>Mani Manivannan, Jie Xiao, Hui Xu, S. R. Narayan</i> Energy Technology, Battery		Abst 1-13 Houston Ballroom A, 3rd Floor (SCC)	Abst 14-21 Houston Ballroom A, 3rd Floor (SCC)	Abst 22-25 Houston Ballroom A, 3rd Floor (SCC) Posters 26-46 Lone Star B/C, 2nd Floor (SCC)
A02	Lithium Ion Batteries and Beyond <i>Brett Lucht, Bryan McCloskey, Guoying Chen, Christopher Johnson, Pawel Kulesza</i> Battery, Physical and Analytical Electrochemistry	Abst 110-115 Lone Star A1, 2nd Floor (SCC) Abst 116-121 Lone Star A2, 2nd Floor (SCC)	Abst 122-133 Lone Star A1, 2nd Floor (SCC) Abst 134-146 Lone Star A2, 2nd Floor (SCC)	Abst 147-158 Lone Star A1, 2nd Floor (SCC) Abst 159-170 Lone Star A2, 2nd Floor (SCC)	Abst 171-176 Lone Star A1, 2nd Floor (SCC) Abst 177-182 Lone Star A2, 2nd Floor (SCC) Posters 183-245 Lone Star B/C, 2nd Floor (SCC)
A03	Large Scale Energy Storage 10 <i>Trung Nguyen, Jagjit Nanda, Bin Li, Jing Xu, Wei Wang, Pawel Kulesza, Shelley Minter</i> Energy Technology, Battery, Industrial Electrochemistry and Electrochemical Engineering, Physical and Analytical Electrochemistry			Abst 400-403 Abst 404-408 San Antonio Ballroom B, 3rd Floor (SCC)	Abst 409-409 Abst 410-410 San Antonio Ballroom B, 3rd Floor (SCC) Posters 411-416 Lone Star B/C, 2nd Floor (SCC)
A04	Battery Student Slam 3 <i>Feng Lin, David Mitlin, Laurence Hardwick, Veronica Augustyn, Guoying Chen, Susan Odom</i> Battery				
A05	Battery Characterization <i>Gabriel Veith, Thomas Barrera, Roseanne Warren, Jun Lu, Gary Koenig, Anne Co</i> Battery, Physical and Analytical Electrochemistry	Abst 510-519 San Antonio Ballroom A, 3rd Floor (SCC)	Abst 520-527 San Antonio Ballroom A, 3rd Floor (SCC)	Abst 528-533 Abst 534-536 San Antonio Ballroom A, 3rd Floor (SCC)	Abst 537-545 San Antonio Ballroom A, 3rd Floor (SCC) Posters 546-550 Lone Star B/C, 2nd Floor (SCC)
A06	Battery Safety and Failure Modes <i>Thomas Barrera, Guangsheng Zhang, Boryann Liaw, Ankur Jain</i> Battery, Industrial Electrochemistry and Electrochemical Engineering			Abst 564-569 State Room 1, 3rd Floor (SCC)	Abst 570-575 State Room 1, 3rd Floor (SCC)
B01	Carbon Nanostructures for Energy Conversion and Storage <i>Jeffrey Blackburn, Michael Arnold, Stephen Doorn, David Cliffel, Christina Bock, Xiulei Ji, Min-Kyu Song, Vito Di Noto, Plamen Atanassov</i> Nanocarbons, Battery, Physical and Analytical Electrochemistry				

235th ECS Meeting • May 26-30, 2019 • Dallas, TX

Tuesday, May 28		Wednesday, May 29		Thursday, May 30	
AM	PM	AM	PM	AM	PM
Abst 47-57 Houston Ballroom A, 3rd Floor (SCC)	Abst 58-68 Houston Ballroom A, 3rd Floor (SCC)	Abst 69-74 Abst 75-81 Houston Ballroom A, 3rd Floor (SCC)	Abst 82-91 Houston Ballroom A, 3rd Floor (SCC)	Abst 92-102 Houston Ballroom A, 3rd Floor (SCC)	Abst 103-109 Houston Ballroom A, 3rd Floor (SCC)
Abst 246-256 Lone Star A2, 2nd Floor (SCC) Abst 257-268 Lone Star A1, 2nd Floor (SCC)	Abst 269-282 Lone Star A1, 2nd Floor (SCC) Abst 283-294 Lone Star A2, 2nd Floor (SCC)	Abst 295-305 Lone Star A2, 2nd Floor (SCC) Abst 306-317 Lone Star A1, 2nd Floor (SCC)	Abst 318-330 Lone Star A2, 2nd Floor (SCC) Abst 331-343 Lone Star A1, 2nd Floor (SCC)	Abst 344-354 Lone Star A2, 2nd Floor (SCC) Abst 355-366 Lone Star A1, 2nd Floor (SCC) Abst 367-378 Lone Star A3, 2nd Floor (SCC)	Abst 379-389 Lone Star A2, 2nd Floor (SCC) Abst 390-399 Lone Star A1, 2nd Floor (SCC)
Abst 417-422 Abst 423-427 San Antonio Ballroom B, 3rd Floor (SCC)	Abst 428-431 Abst 432-437 San Antonio Ballroom B, 3rd Floor (SCC)	Abst 438-444 Abst 445-449 San Antonio Ballroom B, 3rd Floor (SCC)	Abst 450-454 Abst 455-459 San Antonio Ballroom B, 3rd Floor (SCC)		
		Abst 460-475 San Antonio Ballroom A, 3rd Floor (SCC)	Abst 476-492 San Antonio Ballroom A, 3rd Floor (SCC)	Abst 493-509 San Antonio Ballroom A, 3rd Floor (SCC)	
Abst 551-559 San Antonio Ballroom A, 3rd Floor (SCC)	Abst 560-563 San Antonio Ballroom A, 3rd Floor (SCC)				
Abst 576-581 State Room 1, 3rd Floor (SCC)	Abst 582-591 State Room 1, 3rd Floor (SCC) Posters 592-594 Lone Star B/C, 2nd Floor (SCC)	Abst 595-600 State Room 1, 3rd Floor (SCC)	Abst 601-607 State Room 1, 3rd Floor (SCC)		
	Posters 608-620 Lone Star B/C, 2nd Floor (SCC)	Abst 621-629 Abst 630-632 City View 8, 4th Floor (SH)	Abst 633-640 City View 8, 4th Floor (SH)	Abst 641-650 City View 8, 4th Floor (SH)	Award 651 Abst 652-659 City View 8, 4th Floor (SH)

235th ECS Meeting • May 26-30, 2019 • Dallas, TX

		Sunday, May 26		Monday, May 27	
Code	Symposium	AM	PM	AM	PM
B02	Carbon Nanostructures in Medicine and Biology <i>Daniel Heller, Tatiana DaRos, Fotios Papadimitrakopoulos, Ardemis Boghossian, Mekki Bayachou, James Burgess, Larry Nagahara</i> Nanocarbons, Organic and Biological Electrochemistry, Sensor				
B03	Carbon Nanotubes - From Fundamentals to Devices <i>Stephen Doorn, Yury Gogotsi, Pawel Kulesza, Ming Zheng, Slava V. Rotkin, R. Bruce Weisman, Shigeo Maruyama, Benjamin Flavel, Yan Li</i> Nanocarbons, Physical and Analytical Electrochemistry			Award 692 Abst 693-695 Abst 696-702 City View 6, 4th Floor (SH)	Abst 703-706 Abst 707-710 City View 6, 4th Floor (SH)
B04	Nano in Latin America <i>Hiroshi Imahori, Mariana Martinez-Pacheco, Slava Rotkin, Juan Lale, Monica Cerro-Lopez, Gaaan Álvarez-Romero</i> Nanocarbons, Dielectric Science and Technology, Electronics and Photonics				
B05	Fullerenes - Endohedral Fullerenes and Molecular Carbon <i>Shangfeng Yang, Alan Balch, Francis D'Souza, Luis Echegoyen, Dirk Guldi, Nazario Martin, Steven Stevenson</i> Nanocarbons			Abst 768-770 Abst 771-779 City View 7, 4th Floor (SH)	Abst 780-787 City View 7, 4th Floor (SH)
B06	2D Layered Materials from Fundamental Science to Applications <i>Jessica Koehne, David Estrada, Ajit Khosla, Yaw Obeng, Stefan De Gendt, Zia Karim, Colm O'Dwyer, Slava V. Rotkin</i> Nanocarbons, Dielectric Science and Technology, Electronics and Photonics, Sensor, Interdisciplinary Science and Technology Subcommittee		Abst 802-812 City View 5, 4th Floor (SH)	Abst 813-822 City View 5, 4th Floor (SH)	Abst 823-830 City View 5, 4th Floor (SH)
B07	Light Energy Conversion with Metal Halide Perovskites, Semiconductor Nanostructures, and Inorganic/Organic Hybrid Materials <i>Hiroshi Imahori, Prashant Kamat, Kei Murakoshi, Tsukasa Torimoto, Vito Di Noto</i> Nanocarbons, Physical and Analytical Electrochemistry		Abst 853-858 Abst 859-862 City View 8, 4th Floor (SH)	Abst 863-865 Abst 866-872 City View 8, 4th Floor (SH)	Abst 873-880 City View 8, 4th Floor (SH)

235th ECS Meeting • May 26-30, 2019 • Dallas, TX

Tuesday, May 28		Wednesday, May 29		Thursday, May 30	
AM	PM	AM	PM	AM	PM
	Posters 660-663 Lone Star B/C, 2nd Floor (SCC)		Abst 664-666 Abst 667-672 City View 6, 4th Floor (SH)	Abst 673-677 Abst 678-684 City View 6, 4th Floor (SH)	Abst 685-691 City View 6, 4th Floor (SH)
Abst 711-715 Abst 716-722 City View 6, 4th Floor (SH)	Abst 723-727 City View 6, 4th Floor (SH) Posters 728-735 Lone Star B/C, 2nd Floor (SCC)	Abst 736-740 Abst 741-747 City View 6, 4th Floor (SH)	Abst 748-749 City View 6, 4th Floor (SH)		
	Posters 750-754 Lone Star B/C, 2nd Floor (SCC)			Abst 755-756 Abst 757-763 City View 5, 4th Floor (SH)	Abst 764-767 City View 5, 4th Floor (SH)
Abst 788-792 Abst 793-796 City View 7, 4th Floor (SH) Posters 797-801 Lone Star B/C, 2nd Floor (SCC)					
Abst 831-842 City View 5, 4th Floor (SH)	Abst 843-847 City View 5, 4th Floor (SH) Posters 848-852 Lone Star B/C, 2nd Floor (SCC)				
Abst 881-885 Abst 886-892 City View 8, 4th Floor (SH)	Abst 893-897 City View 8, 4th Floor (SH)				

235th ECS Meeting • May 26-30, 2019 • Dallas, TX

		Sunday, May 26		Monday, May 27	
Code	Symposium	AM	PM	AM	PM
B08	Porphyryns, Phthalocyanines, and Supramolecular Assemblies <i>Karl Kadish, Roberto Paolesse, Tomas Torres, Nathalie Solladie, Diane Smith, Norbert Jux</i> Nanocarbons, Organic and Biological Electrochemistry				
B09	Nano for Industry <i>Slava V. Rotkin, Luke Haverhals, Francis D'Souza, E. Taylor, Oana Leonte</i> Nanocarbons, Industrial Electrochemistry and Electrochemical Engineering, Physical and Analytical Electrochemistry, Dielectric Science and Technology, Interdisciplinary Science and Technology Subcommittee				
B01-09	Nano Poster Kick-off Nanocarbons				
C01	Corrosion General Session <i>Masayuki Itagaki, Jamie Noel</i> Corrosion			Abst 974-983 City View 1, 4th Floor (SH)	Abst 984-992 City View 1, 4th Floor (SH)
D01	Chemical Mechanical Polishing 15 <i>Gautam Banerjee, R. Rhoades, G. Bahar Basim, V. Chaitanya, Yaw Obeng</i> Dielectric Science and Technology				
E01	Electrodeposition for Advanced Node Interconnect Metallization Beyond Copper <i>Shafaat Ahmed, Jian Zhou, Qiang Huang, James Kelly</i> Electrodeposition				
F01	Industrial Electrochemistry and Electrochemical Engineering General Session <i>Douglas Riemer, John Staser</i> Industrial Electrochemistry and Electrochemical Engineering				

235th ECS Meeting • May 26-30, 2019 • Dallas, TX

Tuesday, May 28		Wednesday, May 29		Thursday, May 30	
AM	PM	AM	PM	AM	PM
Abst 898-900 City View 7, 4th Floor (SH)	Abst 901-905 City View 7, 4th Floor (SH) Posters 906-915 Lone Star B/C, 2nd Floor (SCC)	Abst 916-920 Abst 921-927 City View 7, 4th Floor (SH)	Abst 928-932 Abst 933-938 City View 7, 4th Floor (SH)	Abst 939-943 Abst 944-950 City View 7, 4th Floor (SH)	Abst 951-954 City View 7, 4th Floor (SH)
	Posters 955-956 Lone Star B/C, 2nd Floor (SCC)	Abst 957-961 Abst 962-966 Abst 967 City View 5, 4th Floor (SH)	Abst 968-970 City View 5, 4th Floor (SH)	Abst 971-973 City View 5, 4th Floor (SH)	
	Abst 608-735 City View 6, 4th Floor (SH) Abst 750-956 City View 7, 4th Floor (SH)				
Abst 993-1001 City View 1, 4th Floor (SH)	Abst 1002-1010 City View 1, 4th Floor (SH) Posters 1011-1019 Lone Star B/C, 2nd Floor (SCC)	Abst 1020-1029 City View 1, 4th Floor (SH)			
Abst 1031-1035 Pearl 2, 2nd Floor (SH)	Abst 1036-1041 Pearl 2, 2nd Floor (SH) Poster 1030 Lone Star B/C, 2nd Floor (SCC)	Abst 1042-1047 Pearl 2, 2nd Floor (SH)			
		Abst 1048-1054 Pearl 1, 2nd Floor (SH)	Abst 1055-1063 Pearl 1, 2nd Floor (SH) Posters 1064-1065 Lone Star B/C, 2nd Floor (SCC)		
		Abst 1066-1076 Pearl 5, 2nd Floor (SH)	Award 1077 Abst 1078-1082 Pearl 5, 2nd Floor (SH) Posters 1083-1089 Lone Star B/C, 2nd Floor (SCC)	Abst 1090-1097 Pearl 5, 2nd Floor (SH)	

235th ECS Meeting • May 26-30, 2019 • Dallas, TX

		Sunday, May 26		Monday, May 27	
Code	Symposium	AM	PM	AM	PM
F02	Tutorial on Industrial Electrochemistry <i>Gerardine Botte, John Harb, E. Taylor</i> Industrial Electrochemistry and Electrochemical Engineering				Abst 1098-1102 Pearl 5, 2nd Floor (SH)
F03	Characterization of Porous Materials 8 <i>John Staser, Xiaolin Li, Christina Bock</i> Industrial Electrochemistry and Electrochemical Engineering, Battery, Energy Technology				
F04	Multiscale Modeling, Simulation and Design 3: Enhancing Understanding, and Extracting Knowledge from Data <i>Venkat Subramanian, Scott Calabrese Barton, John Harb, Luis Diaz, Gerardine Botte, Ankur Jain</i> Industrial Electrochemistry and Electrochemical Engineering, Energy Technology				
G01	Silicon Compatible Emerging Materials, Processes, and Technologies for Advanced CMOS and Post-CMOS Applications 9 <i>Fred Roozeboom, Steve Kilgore, Hemanth Jagannathan, Kuniyuki Kakushima, Paul Timans, Evgeni Gusev, Zia Karim, Stefan De Gendt, Durgamadhab Misra, Yaw Obeng</i> Electronics and Photonics, Dielectric Science and Technology			Abst 1164-1171 City View 2, 4th Floor (SH)	Award 1172 Abst 1173 City View 2, 4th Floor (SH) Posters 1174-1179 Lone Star B/C, 2nd Floor (SCC)
G02	Processes at the Semiconductor Solution Interface 8 <i>Colm O'Dwyer, D. Buckley, Arnaud Etcheberry, Andrew Hillier, Robert Lynch, Philippe Vereecken, Heli Wang, Vidhya Chakrapani</i> Electronics and Photonics, Dielectric Science and Technology, Electrodeposition, Physical and Analytical Electrochemistry				
G03	Organic Semiconductor Materials, Devices, and Processing 7 <i>M. Deen, David Gundlach, Benjamin Iniguez, Hagen Klauk</i> Electronics and Photonics				

235th ECS Meeting • May 26-30, 2019 • Dallas, TX

Tuesday, May 28		Wednesday, May 29		Thursday, May 30	
AM	PM	AM	PM	AM	PM
Award 1103 Abst 1104-1109 Pearl 5, 2nd Floor (SH)	Abst 1110-1119 Pearl 5, 2nd Floor (SH) Posters 1120-1121 Lone Star B/C, 2nd Floor (SCC)				
Abst 1122-1127 Pearl 4, 2nd Floor (SH)	Abst 1128-1134 Pearl 4, 2nd Floor (SH)	Abst 1135-1140 Pearl 4, 2nd Floor (SH)	Abst 1141-1147 Pearl 4, 2nd Floor (SH) Posters 1148-1151 Lone Star B/C, 2nd Floor (SCC)	Abst 1152-1160 Pearl 4, 2nd Floor (SH)	Abst 1161-1163 Pearl 4, 2nd Floor (SH)
Abst 1180-1181 Abst 1182-1184 City View 2, 4th Floor (SH)	Award 1185 Abst 1186-1189 City View 2, 4th Floor (SH)	Abst 1190-1192 Abst 1193-1196 City View 2, 4th Floor (SH)	Abst 1197-1200 City View 2, 4th Floor (SH)		
Abst 1201-1203 Abst 1204-1209 City View 3, 4th Floor (SH)	Abst 1210-1216 City View 3, 4th Floor (SH) Posters 1217-1218 Lone Star B/C, 2nd Floor (SCC)	Abst 1219-1221 Abst 1222-1226 City View 3, 4th Floor (SH)	Abst 1227-1231 City View 3, 4th Floor (SH)		
Abst 1232-1235 Abst 1236-1237 City View 4, 4th Floor (SH)	Abst 1238-1244 City View 4, 4th Floor (SH)	Abst 1245-1247 Abst 1248-1250 City View 4, 4th Floor (SH)	Abst 1251-1256 City View 4, 4th Floor (SH) Posters 1257-1259 Lone Star B/C, 2nd Floor (SCC)		

235th ECS Meeting • May 26-30, 2019 • Dallas, TX

		Sunday, May 26		Monday, May 27	
Code	Symposium	AM	PM	AM	PM
H01	Wide Bandgap Semiconductor Materials and Devices 20 <i>SooHwan Jang, Travis Anderson, Jennifer Hite, Erica Douglas, Vidhya Chakrapani, John Zavada</i> Electronics and Photonics			Award 1260 Abst 1261-1266 Austin Ballroom 1, 2nd Floor (SH)	Abst 1267-1272 Austin Ballroom 1, 2nd Floor (SH)
H02	Solid-state Electronics and Photonics in Biology and Medicine 6 <i>Yu-Lin Wang, Wenzhuo Wu, Toshiya Sakata, Zong-Hong Lin, Andrew Hoff, Chih-Ting Lin, Lluis Marsal, M. Deen, Zoraida Aguilar</i> Electronics and Photonics, Sensor			Abst 1296-1304 Austin Ballroom 2, 2nd Floor (SH)	Abst 1305-1309 Austin Ballroom 2, 2nd Floor (SH) Posters 1310-1317 Lone Star B/C, 2nd Floor (SCC)
H03	Wearable and Flexible Electronic and Photonic Technologies 2 <i>Colm O'Dwyer, Jessica Koehne, Ajit Khosla, Wei Gao, Durgamadhab Misra, Shelley Minter, Lain-Jong Li, Yu-Lun Chueh, Sheng Xu, Jong-Hyun Ahn, Sang-Woo Kim</i> Electronics and Photonics, Dielectric Science and Technology, Physical and Analytical Electrochemistry, Sensor, Interdisciplinary Science and Technology Subcommittee				
I01	Hydrogen or Oxygen Evolution Catalysis for Water Electrolysis 5 <i>Hui Xu, Pawel Kulesza, Sanjeev Mukerjee, Nemanja Danilovic, John Weidner, Vivek Murthi</i> Energy Technology, Industrial Electrochemistry and Electrochemical Engineering, Physical and Analytical Electrochemistry		Abst 1379-1388 State Room 2, 3rd Floor (SCC)	Abst 1389-1390 Abst 1391-1397 State Room 2, 3rd Floor (SCC)	Abst 1398-1405 State Room 2, 3rd Floor (SCC)
I02	Materials for Low Temperature Electrochemical Systems 5 <i>Minhua Shao, Prashant Kumta, Gang Wu, Svitlana Pylypenko, William Mustain</i> Energy Technology, Physical and Analytical Electrochemistry	Abst 1473-1484 Houston Ballroom B, 3rd Floor (SCC)	Abst 1485-1496 Houston Ballroom B, 3rd Floor (SCC)	Abst 1497-1500 Award 1501 Abst 1502-1506 Houston Ballroom B, 3rd Floor (SCC)	Abst 1507-1509 Houston Ballroom B, 3rd Floor (SCC)
I03	Renewable Fuels via Artificial Photosynthesis or Heterocatalysis 4 <i>Nianqiang Wu, Pawel Kulesza, Mani Manivannan, Frank Osterloh, Hui Xu, Eric Miller, Bunsho Ohtani, Vaidyanathan Subramanian, Jae Joon Lee, Jihui Yang, Krishnan Rajeshwar</i> Energy Technology, Sensor	Abst 1579-1594 State Room 3, 3rd Floor (SCC)	Abst 1595-1603 State Room 3, 3rd Floor (SCC)	Abst 1604-1611 State Room 3, 3rd Floor (SCC)	Abst 1612-1616 State Room 3, 3rd Floor (SCC)

235th ECS Meeting • May 26-30, 2019 • Dallas, TX

Tuesday, May 28		Wednesday, May 29		Thursday, May 30	
AM	PM	AM	PM	AM	PM
Abst 1273-1278 Austin Ballroom 1, 2nd Floor (SH)	Abst 1279-1285 Austin Ballroom 1, 2nd Floor (SH) Posters 1286-1289 Lone Star B/C, 2nd Floor (SCC)	Abst 1290-1295 Austin Ballroom 1, 2nd Floor (SH)			
Abst 1318-1324 Austin Ballroom 2, 2nd Floor (SH)	Abst 1325-1333 Austin Ballroom 2, 2nd Floor (SH)	Abst 1334-1342 Austin Ballroom 2, 2nd Floor (SH)	Abst 1343-1352 Austin Ballroom 2, 2nd Floor (SH)		
Abst 1353-1354 Abst 1355-1359 Austin Ballroom 3, 2nd Floor (SH)	Abst 1360-1364 Austin Ballroom 3, 2nd Floor (SH) Posters 1365-1366 Lone Star B/C, 2nd Floor (SCC)	Abst 1367-1368 Abst 1369-1373 Austin Ballroom 3, 2nd Floor (SH)	Abst 1374-1378 Austin Ballroom 3, 2nd Floor (SH)		
Abst 1406-1416 State Room 2, 3rd Floor (SCC)	Abst 1417-1426 State Room 2, 3rd Floor (SCC)	Abst 1427-1437 State Room 2, 3rd Floor (SCC)	Abst 1438-1447 State Room 2, 3rd Floor (SCC) Posters 1448-1459 Lone Star B/C, 2nd Floor (SCC)	Abst 1460-1465 Abst 1466-1472 State Room 2, 3rd Floor (SCC)	
Abst 1510-1514 Abst 1515-1519 Houston Ballroom B, 3rd Floor (SCC)	Abst 1520-1531 Houston Ballroom B, 3rd Floor (SCC)	Abst 1532-1543 Houston Ballroom B, 3rd Floor (SCC)	Abst 1544-1554 Houston Ballroom B, 3rd Floor (SCC) Posters 1555-1568 Lone Star B/C, 2nd Floor (SCC)	Abst 1569-1578 Houston Ballroom B, 3rd Floor (SCC)	
Abst 1617-1619 Abst 1620-1625 State Room 3, 3rd Floor (SCC)	Abst 1626-1631 Abst 1632-1640 State Room 3, 3rd Floor (SCC)		Posters 1641-1648 Lone Star B/C, 2nd Floor (SCC)	Abst 1649-1657 State Room 3, 3rd Floor (SCC)	Abst 1658-1668 State Room 3, 3rd Floor (SCC)

235th ECS Meeting • May 26-30, 2019 • Dallas, TX

		Sunday, May 26		Monday, May 27	
Code	Symposium	AM	PM	AM	PM
I04	Energy Conversion Systems Based on Nitrogen 2 <i>Julie Renner, Gang Wu, Yuyan Shao, Hui Xu, Shelley Minteer, Lauren Greenlee</i> Energy Technology, Physical and Analytical Electrochemistry				
I05	Heterogeneous Functional Materials for Energy Conversion and Storage 2 <i>Wilson Chiu, Fanglin Chen, Deryn Chu, Srikanth Gopalan, Torsten Markus, Patrick Masset, Robert Mantz, Steven DeCaluwe, Vito Di Noto, Nian Liu, Andrew Herring</i> High-Temperature Energy, Materials, & Processes, Battery, Energy Technology, Physical and Analytical Electrochemistry		Abst 1693-1695 Abst 1696-1698 State Room 4, 3rd Floor (SCC)	Abst 1699-1701 Abst 1702-1706 State Room 4, 3rd Floor (SCC)	Abst 1707-1708 Abst 1709-1711 State Room 4, 3rd Floor (SCC)
I06	An Invited Symposium on Advances and Perspectives on Modern Polymer Electrolyte Fuel Cells – In Honor of Shimshon Gottesfeld <i>Bryan Pivovar, Yushan Yan, Piotr Zelenay, Thomas Zawodzinski, Huyen Dinh, Gang Wu, Rod Borup, Adam Weber, Peter Pintauro, Hui Xu</i> Energy Technology, Industrial Electrochemistry and Electrochemical Engineering, Physical and Analytical Electrochemistry			Abst 1782-1790 Houston Ballroom C, 3rd Floor (SCC)	Abst 1791-1795 Houston Ballroom C, 3rd Floor (SCC)
K01	Bioelectrochemistry: From Nature-Inspired Electrochemical Systems to Electrochemical Biosensors <i>Graham Cheek, Mekki Bayachou</i> Organic and Biological Electrochemistry, Energy Technology, Physical and Analytical Electrochemistry, Sensor			Abst 1834-1843 Pearl 3, 2nd Floor (SH)	Abst 1844-1848 Pearl 3, 2nd Floor (SH) Posters 1849-1856 Lone Star B/C, 2nd Floor (SCC)
K02	Electron-Transfer Activation in Organic and Biological Systems <i>Graham Cheek, Shelley Minteer</i> Organic and Biological Electrochemistry, Energy Technology, Physical and Analytical Electrochemistry, Sensor				

235th ECS Meeting • May 26-30, 2019 • Dallas, TX

Tuesday, May 28		Wednesday, May 29		Thursday, May 30	
AM	PM	AM	PM	AM	PM
Abst 1669-1681 Pearl 1, 2nd Floor (SH)	Abst 1682-1690 Pearl 1, 2nd Floor (SH) Posters 1691-1692 Lone Star B/C, 2nd Floor (SCC)				
Abst 1712-1716 Abst 1717-1721 State Room 4, 3rd Floor (SCC)	Abst 1722-1724 Abst 1725-1727 Abst 1728-1729 State Room 4, 3rd Floor (SCC)	Abst 1730-1732 Abst 1733-1737 State Room 4, 3rd Floor (SCC)	Abst 1738-1742 Abst 1743-1745 State Room 4, 3rd Floor (SCC) Posters 1746-1765 Lone Star B/C, 2nd Floor (SCC)	Abst 1766-1768 Abst 1769-1772 State Room 4, 3rd Floor (SCC)	Abst 1773-1774 Abst 1775-1777 Abst 1778-1781 State Room 4, 3rd Floor (SCC)
Abst 1796-1804 Houston Ballroom C, 3rd Floor (SCC)	Abst 1805-1813 Award 1814 Houston Ballroom C, 3rd Floor (SCC)	Abst 1815-1823 Houston Ballroom C, 3rd Floor (SCC)	Abst 1824-1833 Houston Ballroom C, 3rd Floor (SCC)		
Abst 1857-1866 Pearl 3, 2nd Floor (SH)	Abst 1867-1869 Pearl 3, 2nd Floor (SH) Posters 1870-1871 Lone Star B/C, 2nd Floor (SCC)				

235th ECS Meeting • May 26-30, 2019 • Dallas, TX

		Sunday, May 26		Monday, May 27	
Code	Symposium	AM	PM	AM	PM
K03	Young Investigators in Organic and Biological Electrochemistry <i>Graham Cheek, Sadagopan Krishnan, Alice Suroviec</i> Organic and Biological Electrochemistry, Physical and Analytical Electrochemistry				
L01	Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry General Session and Grahame Award Symposium <i>Alice Suroviec, Svitlana Pylypenko, Anne Co</i> Physical and Analytical Electrochemistry			Abst 1885-1894 Trinity 3, 3rd Floor (SHS)	Abst 1895-1900 Trinity 3, 3rd Floor (SHS)
L02	Impedance Technologies, Diagnostics, and Sensing Applications 5 <i>Petr Vanysek, Andrew Hillier</i> Physical and Analytical Electrochemistry				
L03	Computational Electrochemistry 5 <i>Stephen Paddison, Iryna Zenyuk, Scott Calabrese Barton</i> Physical and Analytical Electrochemistry, Energy Technology, Industrial Electrochemistry and Electrochemical Engineering			Abst 1942-1945 Abst 1946-1947 Trinity 1, 3rd Floor (SHS)	Abst 1948-1949 Trinity 1, 3rd Floor (SHS) Posters 1950-1953 Lone Star B/C, 2nd Floor (SCC)
L04	Polyoxometallates and Nanostructured Metal Oxides in Efficient Electrocatalysis, Energy Conversion, and Charge Storage <i>Pawel Kulesza, Andrew Herring, Vito Di Noto, Iwona Rutkowska</i> Physical and Analytical Electrochemistry, Energy Technology			Abst 1968-1970 Trinity 3, 3rd Floor (SHS)	Abst 1971-1973 Trinity 3, 3rd Floor (SHS)
M01	Sensors, Actuators, and Microsystems General Session <i>Larry Nagahara, Gary Hunter, Peter Hesketh, Aleksandr Simonian, Bryan Chin, Jessica Koehne, Mike Carter</i> Sensor				Abst 1999-2003 Trinity 5, 3rd Floor (SHS)

235th ECS Meeting • May 26-30, 2019 • Dallas, TX

Tuesday, May 28		Wednesday, May 29		Thursday, May 30	
AM	PM	AM	PM	AM	PM
		Abst 1872-1879 Pearl 3, 2nd Floor (SH)	Abst 1880-1882 Pearl 3, 2nd Floor (SH) Posters 1883-1884 Lone Star B/C, 2nd Floor (SCC)		
Award 1901 Abst 1902-1908 Trinity 3, 3rd Floor (SHS)	Posters 1909-1914 Lone Star B/C, 2nd Floor (SCC)	Abst 1915-1923 Trinity 3, 3rd Floor (SHS)	Abst 1924-1929 Trinity 3, 3rd Floor (SHS)		
	Abst 1930-1939 Trinity 3, 3rd Floor (SHS) Posters 1940-1941 Lone Star B/C, 2nd Floor (SCC)				
Abst 1954-1958 Abst 1959-1963 Trinity 1, 3rd Floor (SHS)	Abst 1964-1967 Trinity 1, 3rd Floor (SHS)				
Abst 1974-1976 Abst 1977-1979 Trinity 3, 3rd Floor (SHS)	Abst 1980-1982 Abst 1983-1985 Trinity 3, 3rd Floor (SHS) Posters 1986-1988 Lone Star B/C, 2nd Floor (SCC)	Abst 1989-1991 Trinity 3, 3rd Floor (SHS)	Abst 1992-1994 Abst 1995-1998 Trinity 3, 3rd Floor (SHS)		
Abst 2004-2012 Trinity 5, 3rd Floor (SHS)	Abst 2013-2020 Trinity 5, 3rd Floor (SHS)	Abst 2021-2032 Trinity 5, 3rd Floor (SHS)	Abst 2033-2038 Trinity 5, 3rd Floor (SHS) Posters 2039-2051 Lone Star B/C, 2nd Floor (SCC)		

235th ECS Meeting • May 26-30, 2019 • Dallas, TX

		Sunday, May 26		Monday, May 27	
Code	Symposium	AM	PM	AM	PM
M02	Semiconductor Electrochemistry and Photoelectrochemistry in Honor of Krishnan Rajeshwar - An Invited Symposium <i>Nianqiang Wu, Scott Calabrese Barton, Pawel Kulesza, Csaba Janáky, Heli Wang, Vaidyanathan Subramanian, Kohei Uosaki, Prashant Kamat, Mani Manivannan</i> Energy Technology, Physical and Analytical Electrochemistry, Sensor				
M03	Sensors for Precision Medicine <i>Praveen Sekhar, Nianqiang Wu, Yuehe Lin, Ajit Khosla, Pengyu Chen, Jessica Koehne, Leyla Soleymani</i> Sensor				
Z01	General Student Poster Session <i>Venkat Subramanian, Kalpathy Sundaram, Vimal Chaitanya, P. Pharkya, Alice Suroviec</i> All Divisions				
Z02	Sustainable Materials and Manufacturing 3 <i>Gerardine Botte, Gautam Banerjee, John Harb, Nianqiang Wu, S. R. Narayan, E. Taylor, Arumugam Manthiram, John Stickney, Katherine Ayers, Gregory Jackson</i> All Divisions, Interdisciplinary Science and Technology Subcommittee			Abst 2239-2245 Pearl 2, 2nd Floor (SH)	Abst 2246-2249 Pearl 2, 2nd Floor (SH) Posters 2250-2255 Lone Star B/C, 2nd Floor (SCC)
Z03	Nanoscale Electrochemical Imaging and Detection <i>Petr Vanýsek, Tomokazu Matsue, Nongjian Tao, David Cliffl</i> All Divisions, International Society of Electrochemistry (ISE)			Abst 2256-2264 Pearl 1, 2nd Floor (SH)	Abst 2265-2270 Pearl 1, 2nd Floor (SH)

235th ECS Meeting • May 26-30, 2019 • Dallas, TX

Tuesday, May 28		Wednesday, May 29		Thursday, May 30	
AM	PM	AM	PM	AM	PM
		Abst 2052-2054 Abst 2055-2059 State Room 3, 3rd Floor (SCC)	Abst 2060-2063 Abst 2064-2067 State Room 3, 3rd Floor (SCC) Poster 2068 Lone Star B/C, 2nd Floor (SCC)		
Abst 2069-2076 Trinity 4, 3rd Floor (SHS)	Abst 2077-2082 Trinity 4, 3rd Floor (SHS)	Abst 2083-2090 Trinity 4, 3rd Floor (SHS)	Abst 2091-2096 Trinity 4, 3rd Floor (SHS) Posters 2097-2112 Lone Star B/C, 2nd Floor (SCC)	Abst 2113-2119 Trinity 4, 3rd Floor (SHS)	Abst 2120-2125 Trinity 4, 3rd Floor (SHS)
	Posters 2126-2238 Lone Star B/C, 2nd Floor (SCC)				

Technical Sessions

SUNDAY, MAY 26

Highlight

1900h..... Opening Reception – Lone Star A3/A4,
Sheraton Convention Center

A01

Battery and Energy Technology Joint General Session

Energy Technology / Battery
Houston Ballroom A, Dallas Sheraton Convention Center

Air and Flow-Based Systems – 13:20 – 18:00

Chair(s): Rahul Singhal and S. R. Narayan

- 13:20 1 **Effect of H₂ Evolution in Aqueous Aluminum Air Battery** – C. Zhou, K. Bhonge, and K. T. Cho (Northern Illinois University)
- 13:40 2 **Analysis of Oxide Film on Aluminum Electrode in Ionic Liquid Based Aluminum-Air Battery** – A. Mohammad, J. Gong, N. S. Hosmane, T. Xu, and K. T. Cho (Northern Illinois University)
- 14:00 3 **Real-Time Imaging Analysis on Dendrite Formation of Aluminium Metal Anodes** – H. W. Liu, N. L. Wu (National Taiwan University), H. W. Huang, C. C. Chiang, and C. C. Yang (Industrial Technology Research Institute)
- 14:20 4 **Dual Electrolyte Aluminum-Air Flow Battery Using Methanol Anolyte** – P. Teabnamang and S. Kheawhom (Chulalongkorn University)
- 14:40 5 **The Role of DMSO As an Electrolyte Additive in Alkaline Zinc-Air Flow Battery** – S. Hosseini and S. Kheawhom (Chulalongkorn University)
- 15:00 6 **Advanced Reversible Long-Lasting Flexible Metal-Air Batteries Using Mn/Fe Hexaiminobenzene Metal-Organic Frameworks** – S. S. Shinde, N. Wagh, D. H. Kim, and J. H. Lee (Hanyang University)
- 15:20 7 **Use of Polarization Curves to Determine Kinetics Parameters in K-O₂ batteries** – G. Gourdin, N. Xiao, and Y. Wu (The Ohio State University)
- 15:40 **Break**
- 16:00 8 **Novel Metal Oxide Electrode Materials for Vanadium Redox Flow Battery Application** – A. W. Bayeh, Y. C. Chang, T. R. Liu, H. Y. Chen, H. C. Huang, D. M. Kabtamu, and C. H. Wang (National Taiwan University of Science and Technology)
- 16:20 9 **Redox-Mediated Bromate Based Electrochemical Energy System** – K. T. Cho and T. Razaulla (Northern Illinois University)

- 16:40 10 **Novel Organic Electrode Materials for Innovative Thick Electrode Based Aqueous Batteries** – S. Perticarari, E. Grange (IMN-CNRS), Y. Pellegrin (CNRS), D. Guyomard (IMN-CNRS, University of Nantes), F. Odobel (CNRS), P. Poizot (IMN, CNRS, University of Nantes), and J. Gaubicher (IMN)
- 17:00 11 **Proton-Conducting Ceramics for Metal-Supported Solid Oxide Fuel Cells and Electrolysis Cells** – R. Wang, C. Byrne, G. Lau, and M. C. Tucker (Lawrence Berkeley National Laboratory)
- 17:20 13 **Performance and Stability of Cathode Electrode Under Carbon Capture Operating Conditions** – A. Hilmi (FuelCell Energy, Inc.), T. C. Geary (FuelCell Energy, Inc), A. Franco, and C. Y. Yuh (FuelCell Energy, Inc.)
- 17:40 12 **Oxygen-Electrode-Supported Solid Oxide Cells with High Fuel and Steam Utilization** – H. Wang, N. R. Geisendorfer, S. Zhang, K. Yang, Y. Sun, K. H. Chiu, and S. A. Barnett (Northwestern University)

A02

Lithium Ion Batteries and Beyond

Battery / Physical and Analytical Electrochemistry
Lone Star A1, Dallas Sheraton Convention Center

Lithium Sulfur Batteries 1 – 10:00 – 12:00

Chair(s): Shuru Chen, Hsun-Yi Chen and Yan Yuan

- 10:00 110 **Simple but Highly-Efficient Polysulfide Trapping Strategy for Lithium-Sulfur Batteries** – Y. Yuan, D. Zheng, Z. Fang (Xi'an University of Architecture and Technology), and H. Lu (Xi'an University of Science and Technology)
- 10:20 111 **High Capacity, Solid State Lithium Sulfur Battery with Ceramic Electrolytes** – P. Choi, A. R. Svensen (CFD Research Corporation), and M. Sanghadasa (US Army AMRDEC)
- 10:40 112 **Low-Porosity Sulfur Cathodes for High-Energy-Density Lithium-Sulfur Batteries** – S. Chen (General Motors Global R&D Center), F. Dai (GM Global R&D Center), and M. Cai (General Motors, Global R&D Center)
- 11:00 113 **Modeling the Effect of Layer-on-Layer Cathodes in Lithium-Sulfur Batteries** – G. L. Shebert, R. Zhang, and Y. L. Joo (Cornell University)
- 11:20 114 **Freestanding CNF/Sulfur-Copolymer Cathodes for Li-S Batteries: Effect of Host Porosity on Battery Performance** – A. Rafie, A. Singh, and V. Kalra (Drexel University)
- 11:40 115 **Investigation of Lithium-Sulfur Battery Performance with Free-Standing Amide-MWCNT Protection Layer** – Y. H. Lai and H. Y. Chen (National Taiwan University)

Lone Star A2, Dallas Sheraton Convention Center

Sodium Batteries 1 – 10:00 – 12:00

Chair(s): Filipe Braga, Seung-Taek Myung and Shahul Hameed Abdulrahman

- 10:00 116 **In-Situ Electrochemical Formation of $\text{Na}_{1+x}\text{Cu}^{3-x}\text{O}_2$ for Cathodes in Sodium Ion Batteries.** – C. Juarez-Yescas (Universidad Autónoma Metropolitana Iztapalapa), G. Ramos-Sánchez (CONACyT-UAM I), and I. González (Universidad Autónoma Metropolitana Iztapalapa)
- 10:20 117 **Bifunctional Electrocatalytic Properties of $\text{Na}_2\text{MPO}_4\text{f}$ (M: Fe, Mn, Co) for Na-Air Batteries** – L. Sharma (Indian Institute of Science, Bangalore) and P. Barpanda (Indian Institute of Science)
- 10:40 118 **Exceptionally Highly Stable Cycling Performance and Facile Oxygen-Redox of Manganese-Based Cathode Materials for Rechargeable Sodium Batteries** – A. Konarov and S. T. Myung (Sejong University)
- 11:00 119 **Binder Degradation in Sodium- and Potassium-Oxygen Batteries** – F. Braga and L. J. Hardwick (University of Liverpool)
- 11:20 120 **$\text{K}_2[(\text{VO})_2(\text{HPO}_4)_2(\text{C}_2\text{O}_4)]$ and K_xVOPO_4 as 4 V-Class Positive Electrode Materials for K-Ion Batteries** – S. H. Abdulrahman, A. Katogi (Tokyo University of Science), K. Kubota (Tokyo University of Science, ESICB-Kyoto University), and S. Komaba (Tokyo University of Science)
- 11:40 121 **Temperature Dependent X-Ray Diffraction in $\text{K}_2\text{FeP}_2\text{O}_7$ Pyrophosphate: Polymorphism and Preliminary Electrochemistry Towards Li, Na, and K Ion Intercalation** – R. Gond (Indian Institute of Science), V. Pralong (Normandy Univ), and P. Barpanda (Indian Institute of Science)

Lone Star A1, Dallas Sheraton Convention Center

Lithium Sulfur Batteries 2 – 14:00 – 18:00

Chair(s): Arumugam Manthiram, Bing-Joe Hwang and Jie Xiao

- 14:00 122 **Room-Temperature Nonaqueous Polyvalent Metal - Sulfur Batteries** – X. Yu and A. Manthiram (The University of Texas at Austin)
- 14:20 123 **Flexible and Self-Supported Sulfur Cathode for High-Energy-Density Lithium-Sulfur Batteries** – J. Liu (South China University of Technology)
- 14:40 124 **Polysulfide-Shuttle Control in Lithium-Sulfur and Sodium-Sulfur Batteries with Polymer-Coated Solid-State Electrolytes** – X. Yu and A. Manthiram (The University of Texas at Austin)
- 15:00 125 **Mxenes As Sulfur Host Material for Magnesium-Sulfur Batteries** – H. Kaland, F. H. Fagerli, J. Hadler-Jacobsen, L. A. Boge, S. K. Schnell, and F. Vullum-Bruer (Norwegian University of Science and Technology)

15:20 126

Dynamics of Lithium Deposition in Li-S Batteries: An Elucidation with a Lithium Sulfide Cathode and a Bare Copper-Foil Current Collector without Any Free Lithium Metal – S. Nanda (University of Texas at Austin), A. Gupta (The University of Texas at Austin), and A. Manthiram (University of Texas at Austin)

15:40 127

Lithium-Sulfur Batteries with a Vertical Co_9S_8 Hollow Nanowall Arrays-Modified Celgard Separator – J. He and A. Manthiram (The University of Texas at Austin)

16:00 128

Fibrous Organosulfur Compounds As Cathode Materials for High-Performance Lithium-Sulfur Batteries – M. A. Weret (National Taiwan University of Science and Technology), B. J. Hwang (NTUST, National Taiwan University of Science and Technology), C. F. Jeffrey Kuo, and W. N. Su (National Taiwan University of Science and Technology)

16:20 129

A Rational Balance Design of Ionic Liquid Based Electrolyte for Advanced Li-S Batteries – H. Lu, Z. Chen, H. Du (Xi'an University of Science and Technology), and K. Zhang (Central South University)

16:40 130

Modeling of High Energy Density Li-S Cell Designs and Testing of Li-S Cells Based on Solid Polymer Electrolytes – Z. Lu and J. Adams (Ford Motor Company)

17:00 131

Effects of N-Doped Graphene and Carbon Black As Conductive Additives on Sulfur Cathodes in Lithium-Sulfur Batteries – X. Han, J. Cai, and X. Meng (University of Arkansas)

17:20 132

Understanding of Failure Mechanism of High Energy Lithium-Sulfur Pouch Cells – L. Shi, D. Lu, C. Niu, X. Ren, J. Xiao, and J. Liu (Pacific Northwest National Laboratory)

17:40 133

Long-Life Lithium-Sulfur Batteries with a Bifunctional Cathode Substrate Configured with Boron Carbide Nanowires – L. Luo and A. Manthiram (The University of Texas at Austin)

Lone Star A2, Dallas Sheraton Convention Center

Sodium Batteries 2 – 14:00 – 18:40

Chair(s): Zhiyuan Zeng, Fabian Linsenmann and Vidushi Sharma

- 14:00 134 **Highly Conductive PEO-Based Polymer Electrolyte for Na Battery Applications** – X. Lu, X. He, H. Wang, D. Reed, and V. Sprenkle (Pacific Northwest National Laboratory)
- 14:20 135 **Revealing of Solid Electrolyte Interphases during Electrochemical Deposition and Dissolution of Sodium** – Z. Zeng (City University of Hong Kong, MSE)
- 14:40 136 **Cu_2s As a Superior Anode for Sodium-Ion Batteries** – J. Cai and X. Meng (University of Arkansas)
- 15:00 137 **Red Phosphorus-Based Materials As Anode for Na-Ion Batteries K-Ion Batteries** – Y. Yu (University of Science and Technology of China)

- 15:20 138 **Investigation of Na Ion Dynamics in P2-Type Na_{2/3}[Ni_{1/3}Ti_{2/3}]O₂: A Combination of Quasi-Elastic Neutron Scattering and First-Principles Molecular Dynamics Study** – Q. Chen and W. Lai (Michigan State University)
- 15:40 139 **Multi-Site Redox Activities in Chemically Complex Sodium Layered Oxide Cathode Materials** – M. M. Rahman and F. Lin (Department of Chemistry, Virginia Tech)
- 16:00 **Break**
- 16:20 140 **Stress Evolution in Na-Ion Battery Anode during Electrochemical Cycling** – S. Rakshit (New Jersey Institute of Technology), O. Ruiz (University of Pennsylvania), E. Detsi (School of Engineering, University of Pennsylvania), and S. Nadimpalli (New Jersey Institute of Technology)
- 16:40 141 **Understanding Sodium Ion Storage and Diffusivity into CNT-TiO₂ Hybrid Electrodes** – S. K. Martha, S. Ghosh, V. Kiran Kumar (Indian Institute of Technology Hyderabad, India), and S. Biswas (Research Center Imarat (DRDO), Hyderabad, India)
- 17:00 142 **Nitrate Combustion Synthesis of NVP-Type Cathode Material for Na-Ion Batteries** – R. Väli, A. Jänes, and E. Lust (Institute of Chemistry, University of Tartu)
- 17:20 143 **2 V-Class Aqueous Multi-Ion Batteries Realized By Superconcentrated Na/K Electrolytes** – T. Hosaka, A. Noda, K. Kubota (Tokyo University of Science), Y. Matsuda, K. Ida, S. Denzumi (Technova Inc.), and S. Komaba (Tokyo University of Science)
- 17:40 144 **Current Collector Interface for Phase Changing Tin Anode in Sodium Ion Batteries: Insight from First Principles Calculations** – V. Sharma (New Jersey Institute of Technology), K. Ghatak (New Jersey Institute of Technology), and D. Datta (Brown University)
- 18:00 145 **Current-Dependent Growth Mechanisms of Sodium Metal Anode in Diglyme-Based Electrolytes** – B. Ma and P. Bai (Washington University in St. Louis)
- 18:20 146 **A Novel Reference Electrode for EIS Measurements in Sodium-Ion Batteries** – F. Linsenmann, D. Pritzl, T. P. Fellinger (Technical University of Munich), and H. A. Gasteiger (Technical University of Munich, Chemistry department)
- 08:20 511 **New Analytical Method to Reveal the Adhesion Properties in the Composite Electrodes for Lithium-Ion Batteries** – Y. M. Lee, S. Byun, Y. Roh, D. Jin (DGIST), and M. H. Ryou (Hanbat National University)
- 08:40 512 **Rapid 3D Imaging for Quality Assurance of Li-Ion Materials Using Lab-Based X-Ray Computed Tomography** – T. M. M. Heenan, A. Leach, C. Tan, R. Jervis, D. J. L. Brett (University College London), and P. R. Shearing (Electrochemical Innovation Lab, UCL, London)
- 09:00 513 **(Invited) From Precursors to Devices: Using Neutron Scattering to Study Synthesis, Processing, and Material Properties** – R. L. Sacci (Oak Ridge National Laboratory)
- 09:30 **Break**
- 10:00 514 **(Invited) Colloidal and Processing Science Characterization for Battery Systems** – B. Armstrong (Oak Ridge National Laboratory)
- 10:40 515 **Pitt Modelling of Concurrent Ion-Insertive and Capacitive Storage Using Laplace Domain Representations of Impedance** – C. A. Hall, Y. Jiang, S. Lim, P. Burr, A. Ignjatovic, and A. Lennon (University of New South Wales)
- 11:00 516 **Characterizing the Surface Free Energy of Composite Electrodes for Li-Ion Batteries** – J. Li (Oak Ridge National Laboratory), A. Davoodabadi, C. Jin (Binghamton University), and D. L. Wood III (University of Tennessee)
- 11:20 517 **Investigation of Capacity and Homogeneity Recovery of Commercial Cells after Cycle Life Tests** – M. Lewerenz (Technische Hochschule Ingolstadt), P. Dechent (RWTH Aachen University - ISEA), C. Endisch (Technische Hochschule Ingolstadt), and D. U. Sauer (Juelich Aachen Research Alliance, JARA-Energy, Germany, RWTH Aachen University - ISEA)
- 11:40 518 **Advanced Technique Development for Li-Ion Electrode Characterisation Using X-Ray Computed Tomography** – S. Randjbar Daemi, C. Tan, X. Lu (University College London), J. Cookson (Johnson Matthey), E. A. Petrucco (Johnson Matthey Battery Materials), A. Palacios-Padros (Johnson Matthey), D. J. L. Brett (University College London), and P. R. Shearing (Electrochemical Innovation Lab, UCL, London)
- 12:00 519 **Fabrication and Characterization of Thick Sintered Lithium-Ion Battery Full Cells** – Z. Nie, P. McCormack (University of Virginia), H. Bilheux, J. Bilheux (Oak Ridge National Laboratory), P. Robinson, and G. Koenig (University of Virginia)

A05

Battery Characterization

Battery / Physical and Analytical Electrochemistry
 San Antonio Ballroom A, Dallas Sheraton Convention Center

Science of Fabrication – 08:00 – 12:20
 Chair(s): Gabriel M. Veith and Jianlin Li

- 08:00 510 **Formation Strategies for Over-Lithiated NCMs Suitable for Large-Scale Cells** – T. Zünd, B. Strehle (Technical University of Munich), and H. A. Gasteiger (Technical University of Munich, Chemistry department)

In Situ Spectroscopy (Interfaces) – 13:00 – 16:30
 Chair(s): Gabriel M. Veith and Robert L Sacci

- 13:00 520 **Battery Characterization Using Operando Optical Diagnostics** – J. M. Porter (Colorado School of Mines) and N. Saqib (University of Indianapolis)

B06 **2D Layered Materials from Fundamental Science to Applications**

Nanocarbons / Dielectric Science and Technology / Electronics and Photonics / Interdisciplinary Science and Technology Subcommittee / Sensor
City View 5, Dallas Sheraton Hotel

2D Layered Materials from Fundamental Science to Applications - Session 1 – 14:00 – 18:00
Chair(s): Elisa M. Miller

- 13:20 **521** **Surface Characterization of Battery Electrode/Electrolyte Materials Using XPS and ToF-SIMS** – E. T. Harrison, S. L. Peczonczyk, A. Sharafi (Ford Motor Company), K. H. Wujcik (Blue Current), A. Drews, and S. Simko (Ford Motor Company)
- 13:40 **522** **(Invited) Solid-Electrolyte Interface and Interphase Depicted By Plasmon-Enhanced Raman Spectroscopy** – J. Nanda, G. Yang, G. M. Veith (Oak Ridge National Laboratory), D. T. Hallinan Jr. (Florida A&M University – Florida State University), and A. P. Sokolov (University of Tennessee)
- 14:10 **523** **On the Way to Elucidate Reaction Mechanisms that Involve Metallic Lithium and Atmospheric Gases Using *In Situ* Ambient Pressure X-Ray Photoelectron Spectroscopy** – A. Etxebarria (Advanced Light Source, LBNL, CIC Energigune), M. Blum (Advanced Light Source, LBNL), D. J. Yun (Advanced Light Source, LBNL), M. Á. Muñoz Márquez (CIC Energigune), and E. J. Crumlin (Joint Center for Energy Storage Research, LBNL)
- 14:30 **524** **Kerr Gated Raman Spectroscopy to Investigate Lithium-Ion Battery Interfaces** – L. J. Hardwick, L. Cabo-Fernandez (University of Liverpool), R. Kostecki (Lawrence Berkeley National Laboratory), and I. Sazanovich (Central Laser Facility, Research Complex at Harwell, STFC)
- 14:50 **525** **(Invited) X-Ray Reflectivity Studies of Interfaces in Lithium-Ion Batteries** – H. G. Steinrueck (SLAC National Accelerator Laboratory)
- 15:20 **Break**
- 15:50 **526** **Elucidating the SEI Formation and Composition As a Function of Binder on Si Anodes Using *In Situ* Neutron Reflectometry** – K. L. Browning (University of Tennessee, Oak Ridge National Laboratory), M. Doucet (Oak Ridge National Laboratory), J. F. Browning (Oak Ridge National Lab), R. L. Sacci, and G. M. Veith (Oak Ridge National Laboratory)
- 16:10 **527** **A Neutron Reflectometry Study of a Metal Oxide/Li-Ion Battery Electrolyte Interface** – E. D. Rus and J. A. Dura (NIST Center for Neutron Research)

- 14:00 **802** **Controlled Electrochemical Synthesis of the Partially Unzipped Multi-Wall Carbon Nanotubes** – M. O. Danilov, I. A. Rusetskii (Institute of General and Inorganic Chemistry), G. I. Dovbeshko (Institute of Physics), G. Y. Kolbasov (Institute of General and Inorganic Chemistry), and J. Tang (National Center of Hybrid Materials)
- 14:20 **803** **Large-Scale Synthesis of MoS₂ Monolayer Using Na-Containing Facilitators for Electromechanical Energy Harvesting** – Y. S. Jung, H. J. Choi (Yonsei university), and Y. S. Cho (Yonsei University)
- 14:40 **804** **Substitutional Nitrogen Defects Enhance Thermal Transport across Graphene Interfaces** – D. Olson (University of Virginia), H. Zhu, T. Granzier-Nakajima, M. Terrones (Pennsylvania State University), and P. E. Hopkins (University of Virginia)
- 15:00 **805** **Fundamentals of the Local Anodic Oxidation of Graphene for Scalable Applications** – S. J. Quesada, A. L. Alvarez, F. Borrás, C. Coya (Universidad Rey Juan Carlos), E. Climent (Universidad Politécnica de Madrid), and A. de Andrés (Instituto de Ciencias de Materiales de Madrid)
- 15:20 **Break**
- 15:40 **806** **Characterizing the Morphology of the Different Grown Homo/Hetero TMD Structures By Controlling Parameters – a Multiscale Computational Approach** – J. Kashyap (New Jersey Institute of Technology), K. Ghatak, and D. Datta (New Jersey Institute of Technology)
- 16:00 **807** **Phosphorene Exfoliated from Black Phosphorous Via Bipolar Electrochemistry** – A. Rabiei Baboukani, I. Khakpour, and C. Wang (Florida International University)
- 16:20 **808** **Effect of Structural Properties on the Photoelectrochemical Performance of Transition Metal Dichalcogenides** – P. S. Tóth (University of Szeged, MTA Premium Post Doctorate Research Program), G. Szabó (University of Szeged), and C. Janáky (ELI-ALPS Research Institute, University of Szeged)
- 16:40 **809** **Transition Metal Dichalcogenides Clusters Immobilized on Defective Black Phosphorus As an Efficient Electrocatalyst for Hydrogen Evolution Reaction** – P. Ou and J. Song (McGill University)
- 17:00 **810** **Hybrid Nanostructures for Electrochemical Reduction of Carbon Dioxide** – S. Ozden (Los Alamos National Lab), T. Asset (University of New Mexico), and P. Atanassov (University of New Mexico, The University of New Mexico)

- 17:20 811 **Enhancing Electrical and Contact Properties of WSe₂ field-Effect Transistors Via Vacuum-Annealed Pt-W Alloy Contacts** – H. Kim, H. Park, and J. Kim (Korea University)
- 17:40 812 **Improved Bending Fracture Behavior of Large-Scale Graphene Monolayer-Intervened Flexible Oxide Thin Films** – H. J. Choi (Yonsei university), D. B. Kim, and Y. S. Cho (Yonsei University)

B07 **Light Energy Conversion with Metal Halide Perovskites, Semiconductor Nanostructures, and Inorganic/Organic Hybrid Materials**

Nanocarbons / Physical and Analytical Electrochemistry
City View 8, Dallas Sheraton Hotel

Low Cost Photovoltaics – 14:00 – 16:00

Chair(s): Zhi David Chen and Takurou N Murakami

- 14:00 853 **(Invited) Application of Impedance Spectroscopy for Perovskite Solar Cells** – T. N. Murakami (Advanced Industrial Science and Technology (AIST))
- 14:20 854 **(Invited) Transient Electron Spin Polarization Imaging of Photoinduced Interfacial Charge Separation Geometries in Organic Photovoltaic Cell** – Y. Kobori, T. Ako, T. Tachikawa (Kobe University), and K. Marumoto (Tsukuba University)
- 14:40 855 **Multi-Bath Electrodeposition of CTZS Increasing Sulfur Ratio Close to Back Contact** – M. A. Saeed (A'Sharqiyah University)
- 15:00 856 **Electronic Structure and Phase Stability of Ag and Sn Doped Cu₂S: A DFT Study** – S. K. Barman (The University of Texas at Arlington) and M. N. Huda (University of Texas at Arlington)
- 15:20 857 **Fabrication of Efficient Perovskite Solar Cells in Ambient Air Using a Humidity-Insensitive Method** – F. Wang, Z. Ye (University of Electronic Science and Technology of China), H. Sarvari, S. M. Park, A. Abtahi, K. Graham (University of Kentucky), Y. Zhao (University of Electronic Science and Technology of China), Z. Chen (University of Kentucky), S. Li, and Y. Wang (University of Electronic Science and Technology of China)
- 15:40 858 **Scanning Photoelectron Spectroscopy of Tapered Cross Sections of Perovskite Solar Cells: Element Distribution, Band Alignment, Space Charge Layers and Photo-Voltage Distributions** – W. Jaegermann (Technische Universität Darmstadt) and T. Mayer (Darmstadt University of Technology, Germany, InnovationLab GmbH, Heidelberg, Germany)

Perovskite Photovoltaics 1 – 16:20 – 17:40

Chair(s): Qilin Dai, Yasuhiro Kobori and Stephan Link

- 16:20 859 **Improved Efficiency and Stability of Perovskite Solar Cells By Structure Engineering** – Q. Dai (Jackson State University)

- 16:40 860 **First-Principles Understanding of Strong Auger Recombination in Hybrid Perovskites** – J. Shen (UC Berkeley), X. Zhang, and C. G. Van de Walle (UC Santa Barbara)
- 17:00 861 **Thermodynamic Approach to Develop Lead-Free Halide Perovskites: Theoretical Study** – J. G. Park, C. H. Chung (Hanbat National University), and K. H. Hong (Hanbat National University)
- 17:20 862 **Electron/Hole-Selective Interfaces in Perovskite Photovoltaics: Electrochemical Studies** – L. Kavan (J. Heyrovsky Institute of Physical Chemistry)

I01

Hydrogen or Oxygen Evolution Catalysis for Water Electrolysis 5

Energy Technology / Industrial Electrochemistry and Electrochemical Engineering / Physical and Analytical Electrochemistry
State Room 2, Dallas Sheraton Convention Center

Alkaline Electrolysis-HER 1 – 14:00 – 17:30

Chair(s): Hui Xu

- 14:00 **Welcoming Remarks**
- 14:10 1379 **Alkaline Water Electrolysis at 20 a cm⁻² with a Microfibrous, Flow-through Electrolyzer** – F. Yang, M. J. Kim, and B. J. Wiley (Duke University)
- 14:30 1380 **Boosting the Hydrogen Evolution Performance of Transition Metal Phosphide Catalysts on 3D Electrode Supports** – J. Sanchez (Stanford University, Department of Chemical Engineering), T. Hellstern (Stanford University Department of Chemical Engineering), L. King (Stanford University), and T. F. Jaramillo (Stanford University, Department of Chemical Engineering)
- 14:50 1381 **Low Temperature Synthesis of WS₂ Using PECVD for Hydrogen Evolution Catalysis** – V. K. Kanade, H. U. Kim, C. K. Kanade (SAINT, Sungkyunkwan University), D. Shin (Mechanical Engineering, Sungkyunkwan University), J. H. Lee (DESR, DME, Ajou University), and T. Kim (SAINT, Sungkyunkwan University, Mechanical Engineering, Sungkyunkwan University)
- 15:10 1382 **New Avenues Towards Designing Transition Metal Phosphides for Efficient Electrocatalysis** – D. Das and K. K. Nanda (Indian Institute of Science)
- 15:30 1383 **Electrochemical Activation of MoTe₂ for the Hydrogen Evolution Reaction** – J. C. McGlynn and A. Y. Ganin (University of Glasgow)
- 15:50 1384 **The Catalytic Roles of Surface Transition Metals on the Hydrogen Evolution/Oxidation Reactions of Pt-Surfaces in Base** – E. Liu (Chemistry and Chemical Biology, Northeastern University), L. Jiao, S. Mukerjee, and Q. Jia (Northeastern University)
- 16:10 1385 **Electrodeposited Iron Phosphide Film As an Efficient Electrocatalyst for Hydrogen Evolution Reaction** – Z. Lu and L. Sepunaru (University of California, Santa Barbara)

- 16:30 1386 **Tuning and Mechanistic Insights of Metal Chalcogenide Molecular Catalysts for the Hydrogen-Evolution Reaction** – J. McAllister, H. Miras (University of Glasgow), N. Bandeira, C. Bo (The Barcelona Institute of Science and Technology), J. C. McGlynn, A. Y. Ganin (University of Glasgow), and Y. F. Song (Beijing University of Chemical Technology)
- 16:50 1387 **Electrodeposition of Co-W Coatings from Acidic-Citrate Solutions for Hydrogen Evolution** – A. M. Kwiecińska, K. Kolczyk, K. Skibinska, D. Kutyla, P. Zabinski, and R. Kowalik (AGH University of Science and Technology)
- 17:10 1388 **The Mechanism of Proton Diffusion in ABO₃ Perovskite Structure** – N. R. Aluru (University of Illinois at Urbana Champaign) and Y. Jing (Harbin Institute of Technology)

102
Materials for Low Temperature Electrochemical Systems 5

 Energy Technology / Physical and Analytical Electrochemistry
 Houston Ballroom B, Dallas Sheraton Convention Center

Fuel Cell Performance and Characterization 1 – 08:20 – 12:20

Chair(s): Jacob S Spendelow and Feng-Yuan Zhang

- 08:20 1473 **Lock-in Thermography As a Diagnostic Tool for Water Detection and Quantification in Polymer Electrolyte Fuel Cells (PEFCs)** – L. Rasha (University College London), D. J. L. Brett, P. R. Shearing (Electrochemical Innovation Lab, UCL, London), and J. I. S. Cho (University College London)
- 08:40 1474 **Lung-Inspired PEM Fuel Cells Built from Layered Printed Circuit Boards** – V. S. Bethapudi (EPSRC Centre for Nature Inspired Engineering, UCL, London, Electrochemical Innovation Lab, UCL, London), J. I. S. Cho (EPSRC Centre for Nature Inspired Engineering, UCL, London), J. Hack, P. R. Shearing, D. J. L. Brett (Electrochemical Innovation Lab, UCL, London), and M. O. Coppens (EPSRC Centre for Nature Inspired Engineering, UCL, London)
- 09:00 1475 **Intermetallic PtCo Catalysts for Fuel Cell Applications** – C. Wang, D. Li, Y. S. Kim (Los Alamos National Laboratory), D. A. Cullen, K. L. More (Oak Ridge National Laboratory), and J. S. Spendelow (Los Alamos National Laboratory)
- 09:20 1476 **Pt-Based Chalcogenide As Cathodic Electrocatalysts for Proton Exchange Membrane FUEL CELL (PEMFC)** – G. I. Moreno-Grijalva (Instituto Tecnológico de Tijuana), G. Alonso (Centro de Nanociencias y Nanotecnología de la UNAM, CNyN), M. T. Oropeza-Guzman (Instituto Tecnológico de Tijuana), and Y. Gochi-Ponce (Instituto Tecnológico de Tijuana)
- 09:40 1477 **Electrospinning and MEA Conditioning As a Tool for Designing Optimized Electrode Structures for Fuel Cell Applications** – S. Kabir (National Renewable Energy Laboratory), L. Anderson (UC Merced), S. Medina, S. Pylypenko (Colorado School of Mines), and K. C. Neyerlin (National Renewable Energy Laboratory)

- 10:00 1478 **Effect of Surfactant for PTFE Binder Dispersion of Electrodes Prepared By Bar Coating Method in High Temperature Polymer Electrolyte Membrane Fuel Cell** – M. J. Lee (Korea Institute of Science and Technology (KIST), Korea University), J. S. Lee, S. Y. Lee, H. J. Kim (Korea Institute of Science and Technology (KIST)), and K. H. Song (Korea University)
- 10:20 1479 **Modelling of a Light-Weight, Flexible, Air-Breathing PEMFC** – A. Kiessling, M. Mayer, and R. S. Besser (Stevens Institute of Technology)
- 10:40 1480 **Pore Morphology Effects of Liquid/Gas Diffusion Layers in Proton Exchange Membrane Electrolyzer Cells** – S. Yu (UT, University of Tennessee Space Institute), G. Yang, Y. Li, B. Canfield (University of Tennessee Space Institute), A. Terekhov (UT Space Institute, University of Tennessee, Knoxville), L. Davis (University of Tennessee Space Institute), and F. Y. Zhang (UT Space Institute, University of Tennessee, Knoxville)
- 11:00 1481 **Necessity to Avoid Titanium Oxide As Catalyst Support in PEM Fuel Cells** – J. Zhang, F. D. Coms, and S. Kumaraguru (General Motors Company)
- 11:20 1482 **Ni/Ni-Cr-P and Ni/Ni-Mo-Cr-P Electrodeposited Coatings As Bipolar Plate in Polymer Electrolyte Membrane Fuel Cell Environment** – U. K. Chanda and S. Pati (Indian Institute of Technology Bhubaneswar)
- 11:40 1483 **Development of Large-Scale Proton-Conducting Fuel Cells for Next Generation SOFC** – S. Wee, S. Lee, S. Park, and D. Shin (Hanyang University)
- 12:00 1484 **Evaluation of Carbon Support Corrosion Using Accelerated Stress Protocol and Impedance Spectroscopy** – J. A. Prithi (Department of Chemistry, IIT-Madras), R. Vedarajan (Centre for Fuel Cell Technology - ARCI), G. Ranga Rao (Department of Chemistry, IIT-Madras), and N. Rajalakshmi (Centre for Fuel Cell Technology - ARCI)

General Electrocatalysis 1 – 14:00 – 18:20

Chair(s): Qingying Jia and Edward F. Holby

- 14:00 1485 **(Invited) Revisiting the Nature of Active Sites in Pyrolyzed Fe-N-C Electrocatalysts: In Situ Monitoring the Structure Evolution of Active Sites in Fe-N-C Catalysts during Pyrolysis** – Q. Jia, J. Li (Northeastern University), D. J. Myers, A. J. Kropf (Argonne National Laboratory), and S. Mukerjee (Chemistry and Chemical Biology, Northeastern University)
- 14:40 1486 **Electron Microscopy Study of Degradation Mechanisms in Platinum Group Metal-Free Catalysts** – D. A. Cullen, K. L. More (Oak Ridge National Laboratory), L. Osmieri, and K. C. Neyerlin (National Renewable Energy Laboratory)

- 15:00 **1487 PGM-Free Oxygen Reduction Reaction Electrocatalyst: From the Design to Manufacturing** – A. Serov (Pajarito Powder, LLC), G. McCool (Pajarito Powder LLC), H. Romero, S. McKinney, A. Lubers (Pajarito Powder, LLC), M. Odgaard (IRD Fuel Cells), T. V. Reshetenko (University of Hawaii - Manoa), and B. Zulevi (Pajarito Powder LLC)
- 15:20 **1488 Manganese Oxide Electrocatalysts: Degradation in Alkaline Energy Conversion Devices** – F. D. Speck (Forschungszentrum Juelich GmbH, Friedrich-Alexander-Universität Erlangen-Nürnberg), P. G. Santori, F. Jaouen (CNRS - Université De Montpellier), and S. Cherevko (Forschungszentrum Jülich GmbH)
- 15:40 **1489 Structure-Function Relationships of PGM-Free ORR Electrocatalysts from Density Functional Theory** – E. F. Holby, U. Martinez, S. Komini Babu, X. Yin, H. T. Chung, and P. Zelenay (Los Alamos National Laboratory)
- 16:00 **1490 Microstructure Characterization of PGM-Free Catalyst Ink Using in-Situ Ultra Small Angle X-Ray Scattering** – J. Park, N. N. Kariuki, D. J. Myers (Argonne National Laboratory), H. Zhang, and G. Wu (University at Buffalo, the State University of New York)
- 16:20 **1491 High-Throughput Synthesis and Characterization of PGM-Free PEFC Cathode Catalysts** – J. Park, M. Ferrandon, E. Coleman, N. N. Kariuki, V. Stamenkovic, and D. J. Myers (Argonne National Laboratory)
- 16:40 **1492 High Performance Fuel Cell Catalysts Synthesized By Fe Metalation of Nitrogen Doped Carbons Derived from Metal Organic Framework ZIF-8** – A. J. Roy, M. T. Sougrati, P. Y. Blanchard (CNRS - Université De Montpellier), D. Jones (CNRS, Université de Montpellier), F. Jaouen (CNRS - Université De Montpellier), M. Primbs, P. Strasser (Technical University Berlin), A. Mehmood, A. R. J. Kucernak (Imperial College London), T. Kosmala, G. Daniel, and C. Durante (Università Degli Studi Di Padova)
- 17:00 **1493 Influence of the Dopant Atom and the Oxygen Vacancy Site for the Oxygen Reduction Reaction on the Titanium Oxide** – T. Saida, T. Suzuki, E. Niwa, and T. Maruyama (Meijo University)
- 17:20 **1494 First-Principles Prediction of Activated Carbon Nanostructures for Catalyzing Oxygen Reduction** – G. P. Hartmann and G. S. Hwang (University of Texas at Austin)
- 17:40 **1495 Nickel and Molybdenum Nitrides As Oxygen Reduction Reaction Catalysts: Probing the Structure-Activity Relationship** – M. Kreider, M. B. Stevens, Y. Liu (Stanford University), A. Gallo (Stanford University, SLAC National Accelerator Laboratory), A. Mehta (SLAC National Accelerator Laboratory), L. A. King (Stanford University), and T. F. Jaramillo (SLAC National Accelerator Laboratory, Stanford University)
- 18:00 **1496 Carbon Nanofiber-Supported Fe₃O₄ nanostructures As Efficient Electrocatalyst for the Oxygen Reduction Reaction** – R. Fernández-Cori and A. M. Baena Moncada (Universidad Nacional de Ingeniería)

103

Renewable Fuels via Artificial Photosynthesis or Heterocatalysis 4

Energy Technology / Sensor
State Room 3, Dallas Sheraton Convention Center

Carbon Dioxide Conversion 1 – 07:55 – 12:20
Chair(s): Scott Kevin Cushing and Shu Hu

- 07:55 **Welcoming Remarks**
- 08:00 **1579 A Gold-Polyaniline Nanocomposites Catalyst with a Posy Bouquet Structure for Efficient Electrocatalytic Reduction of CO₂** – A. Vijayakumar, Y. Zhao, C. Wang, and G. Wallace (University of Wollongong)
- 08:15 **1580 Efficient Electroreduction of CO₂ in an Ultra-Slim Pressurized Electrolyzer** – J. P. Edwards, Y. Xu, C. M. Gabardo, C. T. Dinh, J. Li, Z. Qi, E. H. Sargent, and D. Sinton (University of Toronto)
- 08:30 **1581 A Microfluidic Artificial Photosynthesis Cell for CO₂ Reduction on TiO₂-CuO Photoelectrodes** – E. Kalamaras, M. Belekoukia (Heriot-Watt University), J. Xuan (Loughborough University), J. Andresen (Heriot-Watt University Edinburgh, UK), and M. Maroto-Valer (Heriot-Watt University)
- 08:45 **1582 Effect of the Electrode Shape on CO₂ Electroreduction Product Selectivity over Ag and Cu Catalysts** – S. Sharifi Golru (The Graduate Center of the City University of New York), A. N. Karaiskakis (The City College of New York, CUNY), and E. J. Biddinger (City College of New York, The Graduate Center of the City University of New York)
- 09:00 **1583 Understanding the Influence of Porosity on Product Selectivity for Copper CO₂ Reduction Electrocatalysts** – K. E. Fritz, U. Wiesner, and J. Suntivich (Cornell University)
- 09:15 **1584 The Role of Mesostructure for CO₂ Reduction on Dendritic Copper Electrocatalysts** – H. Mehrabi and R. Coridan (University of Arkansas)
- 09:30 **1585 Stable, High-Rate CO₂ Electroreduction to Multi-Carbon Products in a Membrane Electrode Assembly System** – C. M. Gabardo, C. P. O'Brien, J. P. Edwards, C. T. Dinh, Y. Xu, E. H. Sargent, and D. Sinton (University of Toronto)
- 09:45 **Break**
- 10:05 **1586 Mechanistic Insights of Coupled Proton-Hydride Transfers on Pyridine Immobilized Metal Catalysts for Selective CO₂-Electroreduction to Methanol** – P. Kolla (Chemistry and Chemical Biology, Northeastern University), W. Wang (Department of Chemistry, Wuhan University), Q. Sun (Chemistry and chemical biology, Northeastern University), and S. Mukerjee (Chemistry and Chemical Biology, Northeastern University)
- 10:20 **1587 Co-Electrolysis As an Approach for Efficient Electroreduction of CO₂ to Fuels or Chemicals** – P. J. A. Kenis (Int Inst for Carbon-Neutral Energy Research (WPI-I2CNER))
- 10:35 **1588 Switching between CO₂ Electroreduction Pathways** – A. Seifitokaldani (Department of Chemical Engineering, McGill University)

- 10:50 **1589** **CO₂ Reduction to CO on Au: Facet Dependent Activity and Selectivity** – B. Seger (Technical University of Denmark), S. Mezavilla (Imperial College London), and I. Chorkendorff (Technical University of Denmark)
- 11:05 **1590** **Modelling Anion-Exchange Membrane-Electrode Assembly Systems for CO₂ Reduction** – L. C. Weng (Joint Center for Artificial Photosynthesis, LBNL), A. T. Bell (University of California, Berkeley), and A. Z. Weber (Lawrence Berkeley National Laboratory)
- 11:20 **1591** **Nitrogen and Sulfur Co-Doped Carbon Nano-Onions for Efficient Electrochemical Conversion of Carbon Dioxide** – N. Wanninayake (University of Kentucky), A. Qianxiang (University of Kentucky, Center for Applied Energy Research), M. Thomas (University of Kentucky, Oak Ridge National Laboratory), U. S. Kodithuwakku, A. Hoque, M. I. Guzman (University of Kentucky), B. Guiton (University of Kentucky, Oak Ridge National Laboratory), C. Risko (University of Kentucky, Center for Applied Energy Research), and D. Y. Kim (University of Kentucky)
- 11:35 **1592** **High-Throughput Electrochemical Conversion of Gaseous CO₂ to C₂ Products By Fine-Tuning Structure of La_{2-x}Sr_xCuO_{4+δ} electrocatalyst** – P. Kolla (Chemistry and Chemical Biology), Q. Sun (Chemistry and chemical biology), W. Wang (Department of Chemistry, Wuhan University), and S. Mukerjee (Chemistry and Chemical Biology, Northeastern University)
- 11:50 **1593** **H Sorption Based Materials for the Hydrogenation of CO₂ to Added Value Fuel Products** – M. Leclerc (Université de Sherbrooke), A. Etxebarria, D. J. Yun, Y. Ye, E. J. Crumlin (Advanced Light Source, LBNL), and G. M. Brisard (Université de Sherbrooke)
- 12:05 **1594** **Mesoporous Semiconductors: A New Model to Assess Accessible Surface Area and Increased Photocatalytic Activity** – R. Marschall (University of Bayreuth)
- Metal Oxide Photocatalysts and Photoelectrodes 2 – 13:50 – 17:55**
Chair(s): Dongling Ma and Jaejoon Lee
- 13:50 **1595** **(Invited) Photocatalytic Water-Splitting Composites Working Under UV to Near-Infrared Lights** – J. Zhang (Beihang University)
- 14:20 **1596** **(Invited) Electronic Properties of ABO₄ Photo-Catalysts Under Nb-Substitution and Phase/Pressure-Related Distortions** – M. N. Huda (University of Texas at Arlington), E. Bainglass (University of Texas at Arlington), H. P. Sarker (University of Texas at Arlington, TX), and P. Rao (Worcester Polytechnic Institute, MA)
- 14:50 **1597** **(Invited) Multiple Heterojunction in Single Titanium Dioxide Nanomaterials for Photocatalysis and Photoelectrochemical Cells** – J. H. Park (Yonsei University)
- 15:20 **1598** **(Invited) Electronic Tuning of Photo-Electrocatalytic Processes By Intermediate-Band Oxides** – S. Hu (Yale University)
- 15:50 **1599** **(Invited) Layered Double Hydroxide Based Nanostructured Photocatalysts for Efficient Solar Fuels** – T. Zhang (Technical Institute of Physics and Chemistry, CAS)
- 16:20 **Break**
- 16:40 **1600** **(Invited) Bioinspired Water Oxidation Electrocatalysts Based on Manganese Oxide** – K. T. Nam (Seoul National University)
- 17:10 **1601** **Electrodeposition of Silver Metavanadate (AgVO₃) As a Visible Light-Active P-Type Semiconductor** – A. Vali, F. Firouzan (The University of Texas), and K. Rajeshwar (University of Texas)
- 17:25 **1602** **Developing and Understanding BiFeO₃ Photoelectrodes for Solar Water Splitting** – A. Radmilovic and K. S. Choi (University of Wisconsin-Madison)
- 17:40 **1603** **Visible-Light-Driven Water Splitting Using Perovskite-Type Oxynitride Photoanodes** – J. Seo, T. Hisatomi (Shinshu University), and K. Domen (The University of Tokyo, Shinshu University)

105
Heterogeneous Functional Materials for Energy Conversion and Storage 2

 High-Temperature Energy, Materials, & Processes / Battery / Energy Technology / Physical and Analytical Electrochemistry
 State Room 4, Dallas Sheraton Convention Center

Advanced Imaging and Simulation 1 – 13:50 – 15:40
Chair(s): Wilson K. S. Chiu and Fanglin Chen

- 13:50 **Welcoming Remarks**
- 14:00 **1693** **(Keynote) Emergent Effects of Global Surfaces on Local Microstructure Designs for Functionality in Heterogeneous Functional Materials** – K. L. Reifsnider and Y. Cao (University of Texas Arlington)
- 14:40 **1694** **(Invited) X-Ray Microscopy of Operating Electrochemical Energy Storage Systems** – J. N. Weker (SLAC National Accelerator Laboratory, USA)
- 15:20 **1695** **The Analytical Transport Network Model for Energy Materials Design and Characterization: Extensions for the Modeling of Coupled Flows and Structural Mechanics** – A. P. Cocco and K. N. Grew (U.S. Army Research Laboratory)

Advanced Imaging and Simulation 2 - X-Ray Microscopy – 16:00 – 18:00
Chair(s): Kenneth L Reifsnider and Johanna Nelson Weker

- 16:00 **1696** **(Invited) A New Transmission X-Ray Microscope Beamline at the NSLS-II** – W. K. Lee, M. Ge, X. Xiao, S. Coburn, E. Nazaretski, W. Xu, H. Xu, K. Gofron, and Z. Yin (Brookhaven National Laboratory)

- 16:40 1697 **(Invited) Understanding Heterogeneous Functional Materials Via Scale-Bridging between Nano and Micro Transmission x-Ray Microscopy and Absorption Near Edge Structure** – I. V. Zenyuk (University of California Irvine)
- 17:20 1698 **(Invited) Multi-Modal and Operando Synchrotron Investigation of Energy-Storage Materials** – Y. C. K. Chen-Wiegart (Stony Brook University / Brookhaven National Laboratory)

MONDAY, MAY 27

Highlights

- 0700h..... Session Chair and Symposium Organizer Orientation Breakfast – *Austin Ballroom 3, Sheraton Hotel*
- 0800h..... Nanocarbons Division Richard E. Smalley Research Award Address– *City View 6, Sheraton Hotel*
- 1000h..... Allen J. Bard Award Address in Electrochemical Science – *Houston Ballroom B, Sheraton Convention Center*
- 1000h..... Industrial Electrochemistry and Electrochemical Engineering Division New Electrochemical Technology (NET) Award Address – *San Antonio Ballroom B, Sheraton Convention Center*
- 1410h..... Gordon E. Moore Medal for Outstanding Achievement in Solid State Science and Technology Award Address – *City View 2, Sheraton Hotel*
- 1440h..... Energy Technology Division Supramaniam Srinivasan Young Investigator Award Address – *San Antonio Ballroom B, Sheraton Convention Center*
- 1700h..... Plenary Session and the ECS Lecture – Lone Star A3/A4, *Sheraton Convention Center*
- 1800h..... Technical Exhibit, General Poster Session, and ECS Career Expo – *Lone Star B/C, Sheraton Convention Center*
- 2000h..... Student Mixer – *Chaparral Main Room, Sheraton Hotel*

A01

Battery and Energy Technology Joint General Session

Energy Technology / Battery

Houston Ballroom A, Dallas Sheraton Convention Center

Advances in Batteries - Invited Talks 1 – 08:00 – 12:05

Chair(s): Mani Manivannan and S. R. Narayan

- 08:00 14 **(Invited) The P2 Sodium Layered Oxides in Na Ion-Batteries** – C. Delmas Sr. (ICMCB - CNRS), D. Carlier (ICMCB-CNRS, Univ. Bordeaux, Bordeaux INP, Pessac, France), M. Guignard (CNRS, Université de Bordeaux, ICMCB), and J. Yoshida (TOYOTA MOTOR EUROPE)
- 08:30 15 **(Invited) On the NaMeO₂ (Me = 3d metal) for Na-Ion Batteries** – S. Komaba (Tokyo University of Science, ESICB-Kyoto University) and K. Kubota (Tokyo University of Science, ESICB-Kyoto University)

- 09:00 16 **(Invited) Surface Modified Polypropylene Membrane for High Performance Lithium Metal Coin and Pouch Cell Batteries** – V. G. Pol, P. Kim, and P. Manikandan (Purdue University)
- 09:30 **Break**
- 09:45 17 **(Invited) Strategies for Achieving High-Energy Density Storage Systems** – P. N. Kumta (University of Pittsburgh)
- 10:15 18 **(Invited) Si Materials for Li-ion Battery Negative Electrode Applications** – G. Liu (Lawrence Berkeley National Laboratory)
- 10:45 19 **(Invited) Self-Assembly Synthesis and Interfacial Control of Electrode Architectures** – S. Dai (Oak Ridge National Laboratory)
- 11:15 20 **(Invited) In-Operando Neutron Scattering Studies of Interfacial Electrolyte Chemistry** – C. A. Bridges, C. J. Jafta, X. G. Sun, G. M. Veith (Oak Ridge National Laboratory), G. V. Jensen (NIST), W. Heller, M. J. Cuneo, S. Mahurin, M. P. Paranthaman, and S. Dai (Oak Ridge National Laboratory)
- 11:45 21 **Design of Reversible Electroplating Cells for Energy-Saving Windows** – A. L. Yeang (University of Colorado, Boulder), T. S. Hernandez, M. T. Strand (Stanford University), C. J. Barile (University of Nevada, Reno), and M. D. McGehee (University of Colorado, Boulder)
- Advances in Batteries - Invited Talks 2 – 14:00 – 16:00**
Chair(s): Mani Manivannan
- 14:00 22 **(Invited) Novel Design & Synthesis of Carbon for Lithium-Ion Batteries and Beyond** – M. P. Paranthaman (Oak Ridge National Laboratory)
- 14:30 23 **(Invited) Mechanisms and Material Impacts of Overcharge in Lithium Ion Batteries** – L. Torres-Castro, J. Lamb, and M. Karulkar (Sandia National Laboratories)
- 15:00 24 **(Invited) Suitable Materials and Electrolytes for Li-Ion Battery Fast Charging Applications** – I. Belharouak, Z. Du, J. Li (Oak Ridge National Laboratory), D. L. Wood III (University of Tennessee), and J. Nanda (Oak Ridge National Laboratory)
- 15:30 25 **(Invited) Working Towards a Cost-effective Lithium-ion Battery Recycling Process** – B. J. Polzin, J. Spangenberg, and L. Gaines (Argonne National Laboratory)
- 28 **Effect of the Morphology of Active Nanomaterials and the Printed Structure for Flexible/Stretchable Batteries** – J. Lee (Sungkyunkwan University), H. Lee (Sungkyunkwan University), University of South Carolina, S. Hwang, and D. Byun (Sungkyunkwan University)
- 29 **Atomistic Simulations of Lithiation Induced Structural Changes in Layered-Spinel Nano-Architected Li-Mn-O** – B. Shibiri, R. S. Ledwaba, and P. E. Ngoepe (University of Limpopo)
- 30 **Preparation of N,F,B-Doped Carbon Materials for High-Performance Electric Double Layer Capacitors** – D. K. Kim and Y. Piao (Seoul National University)
- 31 **A Microporous Gel Polymer Electrolyte for Sodium Batteries** – S. Kalami, H. Khani, and J. B. Goodenough (The University of Texas at Austin)
- 32 **All Coconut Sprout Sodium Ion Hybrid Capacitor** – V. Surendran (IISER Thiruvananthapuram), A. R. Suviesh (CENTRAL UNIVERSITY OF TAMILNADU THIRUVARUR), T. V. Vineesh, B. Babu, and M. M. Shaijumon (IISER Thiruvananthapuram)
- 33 **Study on a Novel Double-Layer Anode for Solid Oxide Fuel Cells Based on CO₂ Dry Reforming of Methane** – T. Wei, L. Jia, B. Chen, R. Li, B. Chi, J. Pu, and J. Li (Huazhong University of Science and Technology)
- 34 **Electrochemical Performance Enhancement of Na_{0.7}MnO₂ for Sodium-Ion Batteries By Doping and Conformal Surface Coating** – H. Yu and X. Liang (Missouri University of Science and Technology)
- 35 **Free Standing Nitrogen Deficient Carbon Nitride Oxygen Electrodes for Metal-Air Batteries** – N. Wagh, S. S. Shinde, D. H. Kim, and J. H. Lee (Hanyang University)
- 36 **Nanocomposites of Copper Sulphide and Graphene Oxide for High-Performance Supercapacitors** – R. Singhal, D. Thorne, P. Lemaire (Central Connecticut State University), X. Martinez, C. Zequine, R. Gupta (Pittsburg State University), D. Uhl, E. Scanley, and C. Broadbridge (Southern Connecticut State University)
- 37 **Modeling the Electrical and Thermal Behaviors of a Lithium-Ion Battery Under External Short Circuit Conditions** – J. Cho, B. Koo, C. B. Shin (Department of Energy Systems Research, Ajou University), and Y. C. Ha (Korea Electrotechnology Research Institute)
- 38 **Modeling the Effect of the Operating Temperature on the Performance of a Zinc/Bromine Flow Battery** – D. Lee, B. Koo, J. Lee, and C. B. Shin (Department of Energy Systems Research, Ajou University)
- 39 **Development of MWCNT/ α -MnO₂/MoS₂ Ternary Composite for High-Performance Supercapacitor Application** – R. Rajagopal and K. S. Ryu (Department of Chemistry, University of Ulsan)
- Lone Star B/C, Dallas Sheraton Convention Center
- A01 Poster Session – 18:00 – 20:00**
Chair(s): S. R. Narayan and Mani Manivannan
- 26 **High Performance Lithium Sulfur Batteries Via MoS₂-Protected Lithium Metal Anode** – E. Cha, J. Park, and W. Choi (University of North Texas)
- 27 **Simulation of the Charge Process Incorporating Vanadium Crossover in Vanadium Redox Flow Battery** – Y. S. Chou and S. C. Yen (Chemical Engineering Dept., National Taiwan University)

- 40 **Application of the Maximum Power Point Tracking (MPPT) Algorithm on Lithium-Ion Batteries** – S. Shrestha, M. Dion, and M. Sholin (Admiral Instruments) 09:20 151
- 41 **Highly Concentrated Aqueous Electrolyte with a Large Stable Potential Window for Electrochemical Double-Layer Capacitors** – G. Zhang, B. Jin, and S. Kong (Yangtze Normal University)
- 42 **Electrochemical Method for Graphene Preparation from Multi-Walled Carbon Nanotubes** – M. O. Danilov, I. A. Rusetskii (Institute of General and Inorganic Chemistry), G. I. Dovbeshko (Institute of Physics), O. Y. Khyzhun (Institute for Problems of Materials Science), V. Strelchuk (Institute of Semiconductor Physics), and G. Y. Kolbasov (Institute of General and Inorganic Chemistry) 09:40
- 43 **Exploration of New Electrolyte Additive for Solid Electrolyte Interphase (SEI) Modification** – J. Li, B. Wu, J. A. Lochala (University of Arkansas), and J. Xiao (University of Arkansas, Pacific Northwest National Laboratory) 10:00 152
- 44 **Microstructured Electrodes Supported on Serpentine Interconnects for Stretchable Electronics** – M. Nasreldin (centre microelectronics of provence) 10:20 153
- 45 **Random Heterogeneous Microstructure Construction of Composites By Fractal Geometry** – Z. Guo and S. Wang (shanghai university) 10:40 154
- 46 **Models of Electrochemical Transport in Electrolytes** – M. Zyskin (University of Oxford) 11:00 155

A02**Lithium Ion Batteries and Beyond**Battery / Physical and Analytical Electrochemistry
*Lone Star A1, Dallas Sheraton Convention Center***Solid State Batteries 1 – 08:00 – 12:20****Chair(s):** Maria Martinez-Ibañez, Andrew Keith Kercher and Jorge M. Seminario

- 08:00 147 **Lipon-like Electrolyte Powders Made By Scalable Alternative Processing** – A. K. Kercher, A. S. Westover (Oak Ridge National Laboratory), M. Naguib (Tulane University), M. Kornbluth (Robert Bosch Research & Technology Center), G. M. Veith, and N. J. Dudney (Oak Ridge National Laboratory) 11:40 157
- 08:20 148 **Solid-State Lithium and Li-Ion Batteries with Silica-Gel Solid Nanocomposite Electrolytes** – M. J. Mees (imec), A. Sagara (Technology Innovation Division, Panasonic Corporation), M. Debucquoy, X. Chen, K. B. Gandrud, B. Put (imec), H. Arase, Y. Kaneko (Technology Innovation Division, Panasonic Corporation), and P. M. Vereecken (imec, Belgium and COK, KU-Leuven, Belgium) 12:00 158
- 08:40 149 **Long-Range Origins of Electrodeposition Instability in Solid Electrolytes** – A. N. Mistry and P. P. Mukherjee (Purdue University)
- 09:00 150 **Porous PEO-Silica Hybrid Solid Electrolyte for All-Solid-State Lithium Ion Batteries** – E. T. Weldekidan, V. Hornebecq, and C. Lebouin (Aix-Marseille University)
- 09:20 151 **From Ionic Liquid Fragments Towards Hybrid Nanoparticles for Solid-State Lithium Ion Technology** – J. Bidal, B. Fleutot (Laboratoire de Réactivité et Chimie des Solides, Réseau sur le Stockage Electrochimique de l'Energie), C. Hadad (Laboratoire Glycochimie Antimicrobiens Agroressources), M. Becuwe (Laboratoire de Réactivité et Chimie des Solides, Réseau sur le Stockage Electrochimique de l'Energie), and A. Nguyen Van Nhien (Laboratoire Glycochimie Antimicrobiens Agroressources) **Break**
- 10:00 152 **Interface Engineering on Solid-State Ceramic Electrolyte By Graphene-like Coating for Electrochemically Stable Sodium Metal Batteries** – E. Matios, H. Wang, and W. Li (Dartmouth College)
- 10:20 153 **New Polymer Electrolytes for Safe All Solid-State Lithium Metal Batteries** – M. Martinez-Ibañez, I. Aldalur, E. Sánchez-Diez, U. Oteo (CIC EnergiGUNE), M. Piszcz (Warsaw Technical University, Faculty of Chemistry), H. Zhang (CIC EnergiGUNE), and M. Armand (CIC energiGUNE)
- 10:40 154 **Improving the Performance of All-Solid-State Microbatteries By Conformal Electrodeposition of Polymer Electrolyte into Self-Organized TiO₂ Nanotubes** – V. A. Sugiawati (Aix-Marseille University), F. Vacandio (MADIREL), and T. Djenizian (Ecole Nationale Supérieure des Mines de Saint-Etienne)
- 11:00 155 **Atomic-Scale Rational Designs of Superionic Sulfide-Based Solid-State Electrolytes By Atomic Layer Deposition** – X. Meng (University of Arkansas) and J. W. Elam (Joint Center for Energy Storage Research)
- 11:20 156 **Analysis of Solid-State Electrolytes for Li-Ion Batteries Using a Multiscale Molecular Dynamics Approach** – J. M. Seminario, D. E. Galvez-Aranda, V. Ponce, L. Selis, C. Vicharra, F. Franco-Gallo, and M. Gamero T (Texas A&M University)
- 11:40 157 **Room Temperature Solid-State Lithium Polymer Battery with Polyionic Liquid Pentablock Terpolymer Electrolyte** – T. L. Chen, R. Sun (Texas A&M University), C. Willis (Kraton Performance Polymers, Inc.), B. Morgan, F. Beyer (Army Research Laboratory), and Y. A. Elabd (Texas A&M University)
- 12:00 158 **Improving Cell Resistance and Cycle Life with Solvate/Thiophosphate Hybrid Electrolytes in Lithium Batteries** – A. A. Gewirth (Intl. Institute of Carbon Neutral Energy Research) and M. Philip (University of Illinois)

*Lone Star A2, Dallas Sheraton Convention Center***Lithium Metal Anodes – 08:00 – 12:30****Chair(s):** Jie Xiao, David Mitlin and Brett L. Lucht

- 08:00 159 **(Invited) Electrochemical Fundamentals of Employing Li Metal Anode in the Next-Generation Battery Technologies** – J. Xiao (Pacific Northwest National Laboratory)

- 08:30 **160** **Engineering Lithium Metal Surface to Enable Long-Term Cycling with Carbonate-Based Electrolytes** – J. Huang, C. Peebles, G. Cheng, D. Strand, and Y. Zhu (Wildcat Discovery Technologies)
- 08:50 **161** **Mechanical Properties of Lithium Metal for Next Generation Batteries** – A. Masias (University of Michigan, Ford Motor Company), N. Felten, and J. Sakamoto (University of Michigan)
- 09:10 **162** **A Dual Functional Artificial Solid Electrolyte Interphase for Dendrite-Free Lithium-Metal Batteries** – P. Chiochan, N. Phattharasupakun, S. Duangdangchote, and M. Sawangphruk (Vidyasirimedhi Institute of Science and Technology)
- 09:30 **Break**
- 09:50 **163** **Li Electroplating/Stripping on the Metal Substrate Coated with Carbon Black** – N. Suzuki, N. Yashiro, and Y. Aihara (Samsung R&D Institute Japan)
- 10:10 **164** **Iron Controllable Lithium into Lithotropic Carbon Fiber Fabric: A Novel Li Metal Anode with Improved Cyclability and Dendrite Suppression** – J. Niu, X. Chen, Y. Lv, and M. Shang (University of Wisconsin-Milwaukee)
- 10:30 **165** **Effect of Thickness and Surface Decoration of Lithium-Metal Electrodes for Lithium-Metal Batteries** – M. C. Stan, M. Kolek, M. Börner, D. Liebenau, F. Schappacher, P. Bieker (MEET Battery Research Center, University of Münster), and M. Winter (MEET Battery Research Center, University of Münster, Helmholtz Institute Münster, Forschungszentrum Jülich)
- 10:50 **166** **Investigation on Solvent and Surface Modification Effects for Li Metal Anodes** – H. W. Liu (Industrial Technology Research Institute), Y. T. Weng, and N. L. Wu (National Taiwan University)
- 11:10 **167** **The Fundamental Mechanism behind the Stability of Li Metal Anodes in Non-Aqueous Electrolytes** – J. G. Zhang, X. Cao, X. Ren, and W. Xu (Pacific Northwest National Laboratory)
- 11:30 **168** **Pristine or Highly Defective? Understanding the Role of Graphene Structure for Stable Lithium Metal Plating** – D. Mitlin (Clarkson University)
- 11:50 **169** **Atomic Layer 2D MoS₂ Coated Li-Metal for Advanced Li-Metal Rechargeable Batteries** – W. Choi (University of North Texas)
- 12:10 **170** **A Lithiophilic Scaffold of Three-Dimensional Free-Standing Silver Nanowire Aerogels for Stable Lithium Metal Batteries: *In Operando* xrd Investigation** – N. Phattharasupakun, J. Wutthiprom, S. Duangdangchote, P. Bunyanidhi, and M. Sawangphruk (Vidyasirimedhi Institute of Science and Technology)

Lone Star A1, Dallas Sheraton Convention Center

Solid State Batteries 2 – 14:00 – 16:00

Chair(s): Wu Xu, Jin Dai and Nick Wu

- 14:00 **171** **Hybrid Polymer Electrolytes for Lithium Metal Batteries** – H. Wu, B. Liu, Q. Li (Pacific Northwest National Laboratory), L. Zhang (Pacific Northwest National Laboratory, Inst. of Solid State Physics, Chinese Academy of Sciences), J. G. Zhang, and W. Xu (Pacific Northwest National Laboratory)
- 14:20 **172** **Effects of Lithium-Ion Conducting Solid Particles in Hybrid Electrolytes on Lithium-Ion Cell Performance** – T. H. Kusama, K. Yoshima, T. Sugizaki, K. Hoshina, T. Sasakawa, Y. Harada, and N. Takami (Corporate Research & Development Center, Toshiba Corp.)
- 14:40 **173** **Metrics of Hybrid Polymer/Ceramic Electrolyte for 21700 Cylindrical Solid-State Batteries Powering Electric Vehicles** – C. Mao, S. W. Kim, and Y. Liu (SF Motors Inc)
- 15:00 **174** **Investigation of Li Ion Dynamics in Garnet Oxide Li_{6.5}La₃Zr_{1.5}Ta_{0.5}O₁₂ Using Molecular Dynamics Simulation** – J. Dai (Michigan State University)
- 15:20 **175** **Understanding the Effect of Interlayer on the Performance of All-Solid-State Li₂S Batteries** – M. Shin and A. A. Gewirth (University of Illinois at Urbana-Champaign)
- 15:40 **176** **Ceramic-Polymer Interaction in Solid-State Composite Electrolytes of Lithium Ion Batteries** – H. Yang and N. Wu (West Virginia University)

Lone Star A2, Dallas Sheraton Convention Center

Diagnostics 1 – 14:00 – 16:00

Chair(s): Marshall C. Smart and William Yourey

- 14:00 **177** **The Impact of Radiation Exposure upon Lithium-Ion Batteries for Future Planned NASA Missions to Europa** – M. C. Smart, F. C. Krause, B. V. Ratnakumar, A. Ulloa-Severino, A. Mnatsakanian (Jet Propulsion Lab., California Institute of Technology), L. Bienvenu, J. Dembec, and T. Mault (Energys Advanced Systems, ABSL Space Products, Inc.)
- 14:20 **178** **Low-Cost Self-Assembled Oxide Separator for Rechargeable Batteries** – N. S. Grundish, C. D. Amos, H. Khani, A. Agrawal, and J. B. Goodenough (The University of Texas at Austin)
- 14:40 **179** **Revealing the Atomic Origin of Heterogeneous Li-Ion Diffusion By Probing Na** – B. Xiao (Pacific Northwest National Laboratory), K. Wang (Beijing University of Technology), G. L. Xu (Argonne National Laboratory), J. Song (Pacific Northwest National Laboratory), Z. Chen (Argonne National Laboratory), K. Amine (Stanford University), D. Reed (Pacific Northwest National Laboratory), M. Sui (Beijing University of Technology), V. Sprenkle (Pacific Northwest National Laboratory), Y. Ren (Argonne National Lab), P. Yan (Beijing University of Technology), and X. Li (Pacific Northwest National Laboratory)

- 15:00 **180** **In-Situ Analysis of Nucleation and Growth of Transition Metal Oxalate Particles As Precursors for Battery Active Materials Via Time Evolution of Solution Composition and Particle Size Distribution** – H. Dong, A. Wang (University of Virginia), G. Smart (Mettler Toledo Autochem), D. Johnson (Advanced TechniSales), and G. Koenig (University of Virginia)
- 15:20 **181** **Key Features in the Manufacturing Process of Ultra-Thick Electrodes for High Energy Lithium Ion Batteries** – E. Heider, A. Hoffmann, L. Kremer, C. Dreer, C. Pfeifer (ZSW - Center for Solar Energy and Hydrogen Research), R. Diehm, J. Kumberg, W. Schabel (Karlsruhe Institute of Technology (KIT), Germany), and M. Wohlfahrt-Mehrens (ZSW - Center for Solar Energy and Hydrogen Research)
- 15:40 **182** **Lithium Ion Accelerated Charge Procedure Developed from Half Cell Characterization** – W. Yourey (Penn State University, Hazleton, Lawrence Berkeley National Laboratory), Y. Fu, N. Li, V. Battaglia, and W. Tong (Lawrence Berkeley National Laboratory)
- **189** **Novel Alkyl Aluminum Coating Method for Lithium Ion Batteries Cathode Materials** – M. Aoki, Y. Takemoto (Tosoh-finechem corporation), T. Futagoishi (Tosoh-finechem Corporation), K. Inaba, N. Nakajima (Tosoh-finechem corporation), T. Haraguti, and K. Sakai (University of Miyazaki)
- **190** **Polypropylene Carbonate Based Solid Polymer Electrolytes for Lithium Ion Batteries** – J. LaCoste, N. Campo (University of Louisiana Lafayette), S. Ardoin, Z. He (University of Louisiana at Lafayette), H. Guo (Central South University), and L. Fei (University of Louisiana at Lafayette)
- **191** **All-Solid-State Lithium Batteries Assembled with Surface-Modified Lithium Electrode** – J. Y. Min, H. Son (Hanyang University), H. S. Woo (Department of Chemical Engineering, Hanyang University), and D. W. Kim (Hanyang University)
- **192** **Enhancement of the Cycling Performance of Sodium-Metal Cells By Use of a Conductive Polymer Additive** – J. Y. Choi, M. S. Park, G. K. Veerasubramani, and D. W. Kim (Hanyang University)
- **193** **Lithium-Ion Polymer Cells Fabricated Using in-Situ Cross-Linked Quasi-Solid-State Polymer Electrolyte** – S. G. Park (Hanyang University), Y. C. Jung, Y. Seo (Department of Chemical Engineering, Hanyang University), and D. W. Kim (Hanyang University)
- **194** **A Single Secondary Particle Model for LiFePO_4 Electrochemical Performance Evaluation.** – J. Song, J. Park, and Y. M. Lee (DGIST)
- **195** **Electrochemical Properties of Assbs with High Energy Density Using Thin Solid Electrolyte Sheet** – H. M. Ryu (Korea Institute of Industrial Technology (KITECH)), D. H. Kim (KITECH), M. Y. Kim (Korea Institute of Industrial Technology), H. Y. Jung (KITECH), H. J. Ban (Korea Institute of Industrial Technology(KITECH)), Y. W. Song, S. H. Jeon, and H. S. Kim (Korea Institute of Industrial Technology (KITECH))
- **196** **Fabrication and Electrochemical Studies of Ncm Cathode Active Material with Nano-Grade Materials for All-Solid State Batteries** – S. J. Park (Korea Institute of Industrial Technology (KITECH)), S. H. Yang (Korea Institute of Industrial Technology(KITECH)), M. Y. Kim (Korea Institute of Industrial Technology), H. Y. Jung (KITECH), H. J. Ban (Korea Institute of Industrial Technology(KITECH)), Y. W. Song, S. H. Jeon (Korea Institute of Industrial Technology (KITECH)), S. J. Nam (KITECH), H. S. Kim (Korea Institute of Industrial Technology (KITECH)), J. H. Han, and Y. A. Kim (Chonnam National University)
- Lone Star B/C, Dallas Sheraton Convention Center*
- A02 Poster Session – 18:00 – 20:00**
Chair(s): Brett L. Lucht and Jie Xiao
- **183** **Novel Tin (IV) Oxide-Carbon Composite Anode Material for High-Capacity Li-ion Batteries** – J. A. Weeks (The University of Texas at Austin), C. B. Mullins (University of Texas at Austin), and A. Heller (The University of Texas at Austin)
- **184** **The Effect of Metal-Oxide Coating on the Electrochemical Performance of Carbon-Nanofibers Anodes in Lithium-ion Batteries** – J. Ayala, J. Lopez, G. Gonzalez, and M. Alcoutlabi (University of Texas, Rio Grande Valley)
- **185** **Centrifugally Spun $\alpha\text{-Fe}_2\text{O}_3/\text{TiO}_2$ /Carbon Composite Fibers as Binder-free Anodes for Lithium Ion Batteries** – G. Gonzalez, A. Elizondo, J. Ayala, J. Lopez, and M. Alcoutlabi (University of Texas, Rio Grande Valley)
- **186** **Centrifugally Spun Carbon Composite Fibers and Their use as Anode Materials in Lithium-ion Batteries** – A. Elizondo, R. Gonzalez, J. Lopez, and M. Alcoutlabi (University of Texas, Rio Grande Valley)
- **187** **Interfacial Stabilization for Improved Cycling Performance of Polymer-Based All-Solid-State Batteries Using Additive Combination** – M. Yee (Chungnam National University, Republic of Korea), J. Suk (Korea Research Institute of Chemical Technology), and S. W. Song (Chungnam National University, Republic of Korea)
- **188** **Lithium-Sulfur Batteries with a 1T MoS_2 /Graphene As a Highly Efficient Electrocatalyst** – J. He and A. Manthiram (The University of Texas at Austin)

- 197 **Carbon Nanotubes/Graphene Composites Treated By Nitrogen-Plasma and Covered By Porous Cobalt Oxide through Galvanostatic Electrodeposition As Well As Annealing for Anode Materials of Lithium-Ion Batteries** – C. C. Lin (National Yunlin University of Science and Technology), A. N. Wu, and S. H. Jiang (National Yunlin University of Science and Technology)
- 198 **Electrochemical Properties of Zr⁴⁺ Doped LiFePO₄ cathode Material for Li-Ion Battery** – C. Ellinwood, C. Zavala, O. Carson, and H. Fang (Sam Houston State University)
- 199 **Effect of Titanium Disulfide Cathode Additive in the Performance of Li-S Batteries** – G. P. Pandey, J. I. Adams, J. Callaway, and L. Meda (Xavier University of Louisiana)
- 200 **Structure Engineering and Structure-Property Study of TiNb₂O₇ Nanofibers As Anode for Safer Lithium Ion Batteries** – S. Ardoin (University of Louisiana at Lafayette), J. LaCoste (University of Louisiana Lafayette), H. Guo, Z. He, and L. Fei (University of Louisiana at Lafayette)
- 201 **Facile Improvement of Dual-Functional Catalytic Activity of Perovskite La_{0.6}Sr_{0.4}CoO_{3- λ} Oxide Decorated with Nanostructured Palladium for Oxygen Electrochemical Reactions in Lithium-Air Battery** – K. S. Nahm, M. Y. Oh, and J. J. Lee (Chonbuk National University)
- 202 **Characterization of Limiting Factors in All-Solid-State Lithium Batteries Using an Embedded Reference Electrode** – H. T. Lim, G. H. Chang, H. U. Choi (Changwon National University), and S. Kang (Research Institute of Industrial Science and Technology)
- 203 **Investigation of the Effects of Crystallinity of Iron Oxyhydroxides on Na-Ion Charge Storage** – S. Niu and C. P. Rhodes (Texas State University)
- 204 **Challenge and Perspective of Interface between Li Metal and LLZO in Solid State Battery** – K. Guo (Ford Motor Company)
- 205 **Surface Modification of Graphite Anode Material By Coating WO_{3-x} for Fast Chargeable Lithium Ion Battery** – S. Kim, D. J. Chung, D. Youn, and H. Kim (Hanyang University)
- 206 **Lithium Ion Intercalation into Graphite in so₂-Based Inorganic Electrolyte Towards High-Rate Capable and Safe Lithium Ion Batteries** – J. Lee, A. Kim, H. Jung (Hanyang University), G. Jeong (Korea Electronics Technology Institute), and H. Kim (Hanyang University)
- 207 **Two Dimensional SiO_x Materials As High Capacity Anode Materials for Lithium Ion Battery** – D. Youn, S. Kim, H. Yoo, and H. Kim (Hanyang University)
- 208 **Dual-Crosslinked Polyacrylamide Binders with Various Polysaccharides and Their Application to High Capacity Anodes** – B. Gendensuren, J. Kim, and E. S. Oh (University of Ulsan)
- 209 **Capacity Limiting Factors in Ambient Pressure Li-Air Battery** – A. Dutta, K. Ito, and Y. Kubo (National Institute for Materials Science)
- 210 **Effects of a Novel Fluorinated Linear Carbonate Additive on the High Voltage Performance of Lithium Ion Batteries** – C. B. Dzakpasu, Y. Roh, S. Byun (DGIST), J. Y. Kim, K. M. Kim (Electronics and Telecommunications Research Institute), M. H. Ryou (Hanbat National University), and Y. M. Lee (DGIST)
- 211 **Synthesis of LiNi_{0.8}Mn_{0.1}Co_{0.1}O₂ by an Oxalate Precipitation** – H. N. Pollen (Norwegian University of Science and Technology), N. P. Wagner (SINTEF Industry), and F. Vullum-Bruer (Norwegian University of Science and Technology)
- 212 **Evaluation of High-Rate Pulsed Vs. Continuous Charging in Lithium-Ion Batteries** – A. N. Mansour, J. K. Ko, and G. H. Waller (Naval Surface Warfare Center, Carderock Division)
- 213 **Single-Step Preparation of Li₂S-C Composite Electrode for Sulfide Based All-Solid-State Battery** – G. H. Chang and H. T. Lim (Changwon National University)
- 214 **Size-Effects of Micropattern on Lithium Metal Surface on the Electrochemical Performance of Lithium Metal Secondary Batteries** – D. Kim, J. Park (DGIST), D. Jin, M. H. Ryou (Hanbat National University), and Y. M. Lee (DGIST)
- 215 **Mitigating Storage-Induced Degradation of LiNi_{0.8}Co_{0.1}Mn_{0.1}O₂ for Lithium-Ion Batteries Via Surface Tuning with Phosphate** – W. G. Ryu, H. S. Shin (Korea Institute of Energy Research), M. S. Park (Kyunghee University), K. N. Jung (Korea Institute of Energy Research), and J. W. Lee (Chosun University)
- 216 **One-Step Synergy of Coating and Doping By TiN Atomic Layer Deposition for Significant Improvement on Li-Ion Battery** – Y. Gao, J. Park, and X. Liang (Missouri University of Science and Technology)
- 217 **Improving Rate Capability and Coulombic Efficiency Via Crosslinking Sulfonated Chitosan Protective Coating on Natural Graphite Anode in Lithium Ion Batteries** – C. Y. Lu, C. Y. Chao, and N. L. Wu (National Taiwan University)
- 218 **Honeycomb-like Nitrogen-Doped Carbon 3D Nanoweb@Li₂S Cathode Material for Use in Lithium Sulfur Batteries** – Y. Kim (Department of Chemical Engineering, POSTECH), Y. Noh, S. Lee, J. Bae, Y. Kim, H. Ahn (Pohang University of Science and Technology), and W. B. Kim (Department of Chemical Engineering, POSTECH)
- 219 **Bipolar All-Solid-State Battery Enabled by a Perovskite-Based Hybrid Solid Electrolyte** – H. S. Shin (Korea Institute of Energy Research), M. S. Park (Kyunghee University), K. N. Jung (Korea Institute of Energy Research), and J. W. Lee (Chosun University)

- 220 **Double-Doped Porous Perovskite $\text{La}_{0.6}\text{Ca}_{0.4}\text{Fe}_{0.8}\text{Ni}_{0.2}\text{O}_3$ Nanofibers As a High Efficient Bifunctional Catalyst for Rechargeable Lithium-Oxygen Batteries** – Z. Wang (Huazhong University of Science and Technology), L. Zou (Huazhong University of Science & Technology), R. Li (Huazhong University of Science and Technology), J. Li (Hubei University), B. Chi, J. Pu, and J. Li (Huazhong University of Science and Technology)
- 221 **Comparative Analysis on Deactivation of Redox Mediators in Li-O₂ Battery** – H. Kim, T. T. Nguyen, and Y. K. Sun (Department of Energy Engineering, Hanyang University)
- 222 **Opportunity for High Performance Lithium-Metal Batteries Enabled By in Situ Formation of Highly Stable Solid Electrolyte Interphase Layer** – S. J. Park (Hanyang university), S. H. Lee, and Y. K. Sun (Department of Energy Engineering, Hanyang University)
- 223 **Study on Degradation of Microstructure in Ni-Rich $\text{Li}[\text{Ni}_x\text{Co}_y\text{Mn}_{1-x-y}]\text{O}_2$ ($x = 0.8, 0.9$) Cathodes from Accelerated Calendar Aging** – H. H. Ryu, K. J. Park, U. H. Kim, J. H. Kim, and Y. K. Sun (Department of Energy Engineering, Hanyang University)
- 224 **Simultaneous MgO Coating and Mg Doping of Co-Free Cathode Material for High-Voltage Sodium-Ion Batteries** – T. Y. Yu and Y. K. Sun (Department of Energy Engineering, Hanyang University)
- 225 **Sulfurized Polyacrylonitrile Cathode and Polyacrylic Acid Binder for Advanced Potassium-Sulfur Batteries** – J. Y. Hwang, H. M. Kim, S. Shin, and Y. K. Sun (Department of Energy Engineering, Hanyang University)
- 226 **Studying the Influence of Carbon Sources Added on a Cost Effective Route to Synthesize LiFePO_4/C in a Quasi-Open Environment** – F. Gu, K. Jung (University of California, Riverside), and A. A. Martinez-Morales (Materials Science and Engineering, UC Riverside)
- 227 **Phase Inversion Strategy to Flexible Freestanding Electrodes: Critical Coupling of Binders and Electrolytes for High Performance Li-S Battery** – W. Wahyudi, Z. Chao, P. Kumar, M. Li, Y. Wu, M. N. Hedhili, L. Cavallo, L. J. Li, J. Ming, and T. D. Anthopoulos (King Abdullah University of Science and Technology)
- 228 **In-Depth Analysis of Binder Distribution within Lithium-Ion Battery Electrode Using SAICAS** – S. Byun (DGIST), K. Kim (Hanbat National University), J. Choi (University of Wollongong), M. H. Ryou (Hanbat National University), and Y. Lee (DGIST)
- 229 **Electrolyte Effects on the Intercalation of PF_6^- into Graphite Positive Electrode for Dual-Ion Batteries** – D. Yu and Y. Wang (City University of Hong Kong)
- 230 **Interconnected Porous Sb-C Nanocomposite As an Anode Material with High Capacity for K-Ion Batteries** – H. S. Ki, R. Verma, and C. J. Park (Chonnam National University)
- 231 **Carbon Coated Tin Selenide Nanocomposite Anode Materials for Advanced Potassium-Ion Batteries** – R. Verma and C. J. Park (Chonnam National University)
- 232 **Solid-State Li-O₂ Battery Using a Perovskite Type Solid Electrolyte with an Improved Interfacial Property** – T. T. Khan and C. J. Park (Chonnam National University)
- 233 **Polycarbonate and Poly(ethylene oxide) Blending As a Solid Polymer Electrolyte for All Solid State Li-Ion Batteries** – B. J. Sung, P. N. Didwal, and C. J. Park (Chonnam National University)
- 234 **In-Situ Growth of Conductive Copper Metal Organic Framework on Silicon Nanoparticles for High Performance Lithium Ion Batteries** – A. Nazir and C. J. Park (Chonnam National University)
- 235 **KPF₆-KFSa Binary Salt Electrolytes for 4 V-Class Potassium Batteries** – T. Hosaka, T. Matsuyama (Tokyo University of Science), K. Kubota, and S. Komaba (Tokyo University of Science, ESICB-Kyoto University)
- 236 **Electrochemical Properties of Petroleum Coke As Active Material of Negative Electrode in Lithium Batteries** – E. Kuzmina (Ufa Institute of Chemistry of Russian Academy of Sciences), N. Chudova (Ufa Institute of Chemistry the Russian Academy of Sciences, Ufa State Petroleum Technological University), T. Prosochkina (Ufa State Petroleum Technological University), E. Karaseva (Ufa Institute of Chemistry of Russian Academy of Sciences), and V. Kolosnitsyn (Ufa Institute of Chemistry of Russian Academy of Sciences, Ufa State Petroleum Technological University)
- 237 **Fabrication of a Spinose Structure LiFePO_4 Cathode Via Surface Etching to Improve the Rate Capability and Cycling Stability of Li-Ion Batteries** – J. Kim (Chemical and Environmental Engineering, UC Riverside, CE-CERT, UC Riverside), T. Lim (CE-CERT, UC Riverside), and A. A. Martinez-Morales (Materials Science and Engineering, UC Riverside, CE-CERT, UC Riverside)
- 238 **The Effect of Support Salt on Penetration Depth of Reaction of Electrochemical Reduction of Sulfur into Volume of Positive Electrode of Lithium-Sulfur Batteries** – E. Karaseva, E. Kuzmina, D. Kolosnitsyn, A. Melnikova, N. Shakirova, and V. Kolosnitsyn (Ufa Institute of Chemistry of Russian Academy of Sciences)
- 239 **Fabrication and Characterization of Highly Ordered Graphite Nanofiber Network Structure for Lithium-Sulfur Batteries** – D. K. Lee, H. J. Jeon, and C. W. Ahn (KAIST)
- 240 **Carbon Quantum Dots Deposited on TiO_2 Hollow Spheres for Lithium-Ion Battery Anodes** – A. Martinez-Morales and S. Lee (UC,Riverside)
- 241 **Experiment and Modeling of Electrochemical Performance of Lithium-Sulfur Batteries with Varying Carbon to Sulfur Ratios** – G. Koenig, C. Michaelis (University of Virginia), N. Erisen, and D. Eroglu (Middle East Technical University)

- 242 **Electrochemical Performance of Artificial Graphite Coated By Petroleum Pitch for Anode Material in Li-Ion Battery** – J. D. Lee and Y. J. Jo (Chungbuk National University)
- 243 **Superior Lithium/Potassium Storage Capability of Nitrogen-Rich Porous Carbon Nanosheets Derived from Petroleum Coke** – P. Li and Y. K. Sun (Department of Energy Engineering, Hanyang University)
- 244 **Electrochemical Investigations of High Voltage $\text{Na}_4\text{Ni}_3(\text{PO}_4)_2\text{P}_2\text{O}_7$ Cathode for Sodium Ion Batteries** – R. K. Petla (QEERI), R. Amin (Qatar Environment and Energy Research Institute), I. Belharouak (Qatar Environment & Energy Research Institute, HBKU), M. T. Sougrati (RS2E FR 3459 CNRS, France), H. Ben Yahia (Qatar Environment & Energy Research Institute, HBKU), and R. Essehli (Qatar Environment and Energy Research Institute)
- 245 **Increasing Surface Charge Density By Intrinsic Charge Layer Inclusion for High Performance Efficient Triboelectric Nanogenerators** – A. Ravichandran, M. Ramuz, and S. Blayac (EMSE-CMP)
- 11:30 406 **Low Cost Zinc-Iron Rechargeable Flow Battery with High Energy Density** – A. Accogli, M. Gianellini, G. Panzeri, E. Gibertini, and L. Magagnin (Politecnico di Milano)
- 11:50 407 **A Quinone-Based Redox Flow Battery at Near-Neutral pH with Record Capacity Retention Rate** – Y. Ji (Harvard Department of Chemistry and Chemical Biology), M. A. Goulet (Harvard School of Engineering and Applied Sciences), D. Pollack (Harvard Department of Physics), D. G. Kwabi, S. Jin, D. De Porcellinis (Harvard School of Engineering and Applied Sciences), E. Kerr, R. G. Gordon (Harvard Department of Chemistry and Chemical Biology), and M. J. Aziz (Harvard School of Engineering and Applied Sciences)
- 12:10 408 **A Low-Cost and Robust Aqueous Organic Redox Flow Battery** – B. Yang, A. Murali, A. Nirmalchandar, B. S. Jayathilake (University of Southern California), G. K. Surya Prakash (Loker Hydrocarbon Research Institute, Dept of Chemistry, University of Southern California), and S. R. Narayanan (University of Southern California)

A03**Large Scale Energy Storage 10**

Energy Technology / Battery / Industrial Electrochemistry and Electrochemical Engineering / Physical and Analytical Electrochemistry

San Antonio Ballroom B, Dallas Sheraton Convention Center

Aqueous Systems - Systems/Demonstrations – 08:00 – 10:05

Chair(s): Trung Van Nguyen and Wei Wang

- 08:00 **Introduction**
- 08:05 400 **(Invited) Development and Practical Verification of the Redox Flow Battery in SEI** – T. Shigematsu (Power Systems R&D Center, Sumitomo Electric Industries, Ltd.)
- 08:45 401 **A 10kW Class Ti/Mn Redox Flow Battery** – H. Kaku, H. Yamaguchi, Y. R. Dong, R. Tatsumi, K. Miyatake, K. Moriuchi, Y. Tsutsui, and T. Shigematsu (Power Systems R&D Center, Sumitomo Electric Industries, Ltd.)
- 09:05 402 **(Invited) Status and Future Perspectives of Redox Flow Batteries** – Z. G. Yang (UniEnergy Technologies)
- 09:35 403 **(Invited) 100MW-class vanadium flow battery projects in different applications in China** – M. Huang (VRB Energy Operations (Beijing) Co. Ltd.)

Aqueous Systems - Electrolytes/Electrode Materials 1 – 10:20 – 12:30

Chair(s): Wei Wang and Trung Van Nguyen

- 10:20 404 **(Invited) Performance Improvements and Cost Considerations of the Vanadium Redox Flow Battery** – M. Skyllas-Kazacos (UNSW Sydney)
- 11:00 405 **(Invited) Zinc Based Flow Battery for Stationary Energy Storage** – X. Li (Dalian Institute of Chemical Physics)

Industrial Electrochemistry and Electrochemical Engineering Division New Electrochemical Technology (NET) Award Address –

14:00 – 14:40

Chair(s): John A. Staser and Trung Van Nguyen

- 14:00 409 **(Industrial Electrochemistry and Electrochemical Engineering Division New Electrochemical Technology (NET) Award Address) Development and Commercialization of Large Scale PEM Water Electrolysis** – R. Abouatallah, N. I. Joos, R. Y. Wang, and A. Sinanan (Hydrogenics Corporation)

Energy Technology Division Supramaniam Srinivasan Young Investigator Award Address – 14:40 – 15:20

Chair(s): Andrew M. Herring and Trung Van Nguyen

- 14:40 410 **(Energy Technology Division Supramaniam Srinivasan Young Investigator Award Address) Towards Deterministic Electrode Design: Elucidating the Role of Surface Chemistry and Microstructure on Flow Battery Performance** – F. R. Brushett (Joint Center for Energy Storage Research, MIT, Department of Chemical Engineering, MIT)

Lone Star B/C, Dallas Sheraton Convention Center

A03 Poster Session – 18:00 – 20:00

- 411 **Microwave Synthesis of TiP_2O_7 assisted By Carbon-Coating As Anode Material for Aqueous Rechargeable Lithium Ion Batteries** – H. Song (Carnegie Mellon University), J. Chang (West Virginia University), J. Wu, W. Wu, and J. Whitacre (Carnegie Mellon University)

- **412** **Linked Donor-Acceptor Systems for Symmetric Nonaqueous Redox Flow Batteries** – A. Rajewski, S. C. Mann, N. J. Mortimer, A. Dumitrascu (Michigan State University Bioeconomy Institute), J. G. Gillmore (Hope College, Michigan State University Bioeconomy Institute), and T. F. Guarr (Michigan State University Bioeconomy Institute, Jolt Energy Storage Technologies, LLC) 09:40
- **413** **Building Blocks for Symmetric Multielectron Nonaqueous Redox Flow Batteries** – A. Porath, S. C. Mann, A. Dumitrascu, D. R. Henton (Michigan State University Bioeconomy Institute), J. G. Gillmore (Hope College, Michigan State University Bioeconomy Institute), and T. F. Guarr (Jolt Energy Storage Technologies, LLC, Michigan State University Bioeconomy Institute) 10:00
- **414** **Enhancing Cell Performances of High Ni-Content NCM cathode By Surface Modification with SiO₂** – H. S. Kim, S. H. Lee, G. Park, and B. S. Jin (KERI) 10:20
- **415** **Polysulfone-Based Membranes for Vanadium Redox-Flow Batteries** – E. A. Karpushkin, A. I. Komayko, V. A. Timoshenko, and V. G. Sergeev (Lomonosov Moscow State University) 11:20
- **416** **Strategies for Hydraulic Recharge of Zinc-Air Flow Batteries** – F. Mahlendorf, D. Fuchs, C. Müller, and A. Heinzl (University of Duisburg-Essen, LET) 11:40

Break

532 **Electrochemical Bridging-Impact Method for Characterizing the NCA@Carbon Core-Shell Cathode** – A. Krittayavathananon, S. Duangdangchote, and M. Sawangphruk (Vidyasirimedhi Institute of Science and Technology)

533 **(Invited) In-Situ Measurements of Stress Evolution in Composite Sulfur Cathodes** – M. Pharr, Y. Zhang, Y. Luo, C. Fincher, and S. Banerjee (Texas A&M University)

In Situ Spectroscopy 1 (Bulk) – 11:00 – 12:00

Chair(s): Feng Lin, Gabriel M. Veith and Robert J. Messinger

534 **Ex Situ and Operando Characterization of Energy Storage Materials By Benchtop XAFS and XES** – E. Jahrman, A. Ditter, W. Holden, L. Pellerin, G. T. Seidler, L. Bradshaw (University of Washington), B. J. Polzin, and T. T. Fister (Argonne National Laboratory)

535 **Discharge Reactions of γ -MnO₂ and Mo₆S₈ Tracked in the Electrode Bulk of Sealed Devices By Energy Dispersive X-Ray Diffraction (EDXRD)** – J. W. Gallaway, M. A. Kim (Northeastern University), A. Jadhav, R. J. Messinger (The City College of New York), and J. Okasinski (Argonne National Laboratory)

536 **Operando study of Chemical and Structural Evolutions of TiS₂ in Li-Ion and Na-Ion Batteries** – C. H. Lin (Stony Brook University), K. Sun (Brookhaven National Laboratory, Stony Brook University), K. Attenkofer, M. Topsakal, J. Bai (Brookhaven National Laboratory), C. Zhao (Stony Brook University), D. Lu, E. Dooryhee, E. Stavitski (Brookhaven National Laboratory), P. Northrup (Stony Brook University), H. Gan (Brookhaven National Laboratory), and Y. C. K. Chen-Wiegart (Stony Brook University, Brookhaven National Laboratory)

In Situ Spectroscopy 2 (Bulk) – 13:30 – 17:30

Chair(s): Feng Lin, Jennifer L. Schaefer and Gabriel M. Veith

537 **Self-Diffusion of Electrolyte Species in Composite Battery Electrodes Using PFG-SE MAS NMR for Better Understanding of Their Electrochemical Performance** – S. J. Tambio (Institut des Matériaux Jean Rouxel Nantes), M. Deschamps (Orleans University), M. Deschamps (Centre National de la Recherche Scientifique (CNRS)), V. Saroukhanian (CNRS), T. Douillard (Laboratoire MATEIS, INSA-Lyon), F. Cadiou (Univ Lyon, INSA Lyon, CNRS, MATEIS), E. Maire (Laboratoire MATEIS, INSA-Lyon), N. Besnard (Renault Research Department), and B. Lestriez (IMN, CNRS/University of Nantes)

538 **(Invited) Synchrotron X-Ray Spectroscopy and Imaging for Studying Intercalation Battery Chemistries** – F. Lin (Department of Chemistry, Virginia Tech)

A05**Battery Characterization**

Battery / Physical and Analytical Electrochemistry

San Antonio Ballroom A, Dallas Sheraton Convention Center

Stress and Strain – 08:00 – 11:00

Chair(s): Matt Pharr and Erik G. Herbert

- 08:00 **528** **(Invited) Mechanisms of Stress Relaxation and Intensification at the Lithium/Solid Electrolyte Interface** – E. G. Herbert, S. A. Hackney (Michigan Technological University), and N. J. Dudney (Oak Ridge National Laboratory)
- 08:40 **529** **Cross Sectional Mapping of Nano-Mechanical Properties of Composite Electrodes for Lithium Ion Batteries Using Bimodal Mode Atomic Force Microscopy** – T. Masuda, H. Sakai (National Institute for Materials Science), Y. Taniguchi (Asylum Research, Oxford Instruments KK), and K. Uosaki (National Institute for Materials Science)
- 09:00 **530** **A Modified Phenomenological Force Model for Charge Process of Lithium-Ion Battery** – R. Li (Tsinghua University), D. Ren (Tsinghua University), C. Xu (China Agricultural University), Z. Hou, X. Han (Tsinghua University), L. Lu (Collaborative Innovation Center of Electric Vehicles), and M. Ouyang (Tsinghua University)
- 09:20 **531** **Pressure Evolution in Constrained Li Metal Pouch Cells** – A. Raj (Princeton University), C. C. Dickerson (Idaho National Laboratory), C. Niu, J. Xiao (Pacific Northwest National Laboratory), D. A. Steingart (MAE/ACEE Princeton University), E. J. Dufek, and B. Liaw (Idaho National Laboratory)

- 14:30 539 **In Situ Characterization of Lithium Deposition and Microstructure Evolution of Silicon Anodes By Synchrotron X-Ray Imaging** – K. Dong (Technische Universität Berlin, Helmholtz-Zentrum Berlin), H. Markötter, M. Osenberg, F. Sun (Helmholtz-Zentrum Berlin), T. Arlt (Technische Universität Berlin), A. Hilger, and I. Manke (Helmholtz-Zentrum Berlin)
- 14:50 540 **Accessing the Lithiation/Delithiation Mechanism of a Li-Ion Battery FeSi₂/Si/Graphite Composite Negative Electrode and Differentiating the Si/Graphite Contributions By Simultaneous Operando Synchrotron SAXS/WaxS** – C. L. Berhaut (UGA, CEA, CNRS, INAC-SyMMES, 38000 Grenoble, France), D. Zapata Dominguez, S. Tardif, S. Pouget (UGA, CEA, CNRS, INAC-MEM, 38000 Grenoble, France), and S. Lyonnard (CEA Grenoble, DSM/INAC/SPrAM/PCI, UMR 5819)
- 15:10 541 **Operando SANS and Synchrotron Radiography Characterization of the Carbon Cathode from Lithium Sulfur Batteries** – C. J. Jafta (Oak Ridge National Laboratory), S. Risse (Helmholtz-Zentrum Berlin), S. Prévost (Institut Max von Laue - Paul Langevin), M. Trapp (Helmholtz-Zentrum Berlin), S. Dai (Oak Ridge National Laboratory), and M. Ballauff (Helmholtz Zentrum Berlin)
- 15:30 **Break**
- 16:00 542 **(Invited) Speciation and Electrochemical Properties of Magnesium-Ion Electrolytes** – L. C. Merrill, B. Park, and J. L. Schaefer (University of Notre Dame)
- 16:30 543 **Electrochemical Environments for Operando Three-Dimensional Studies of Rechargeable Batteries** – C. Tan, S. Randjbar Daemi, T. M. M. Heenan, D. J. L. Brett (University College London), and P. R. Shearing (Electrochemical Innovation Lab, UCL, London)
- 16:50 544 **²³Na and ³¹P Solid-State NMR: A Key Tool to Study Local Environments in Na₃V₂(PO₄)₂F_{3-y}O_y (0 ≤ y ≤ 2) Materials** – H. B. L. Nguyen (LRCS, Université de Picardie Jules Verne, Amiens, France), P. Sanz Camacho (ICMCB), C. Masquelier (LRCS, Université de Picardie Jules Verne, Amiens, France), L. Croguennec, and D. Carlier (ICMCB-CNRS, Univ. Bordeaux, Bordeaux INP, Pessac, France)
- 17:10 545 **(Invited) Molecular-Level Understanding of Ion Intercalation Mechanisms in Aluminum and Zinc Battery Electrodes Revealed By Solid-State NMR Spectroscopy** – R. J. Messinger, A. Jadhav, B. E. Hawkins, and J. Xu (Dept. of Chemical Engineering, The City College of New York)

Lone Star B/C, Dallas Sheraton Convention Center

A05 Poster Session – 18:00 – 20:00

- 546 **Study of Sulfur-Based Electrodes By Operando Acoustic Emission** – Q. Lemarie (INRS-EMT Varennes, INSA LYON), H. Idrissi (INSA-Lyon), P. X. Thivel (Univ. Grenoble Alpes, LEPMI, F-38000 Grenoble, France), F. Alloin (Université Grenoble Alpes -CNRS), and L. Roué (INRS-EMT)
- 547 **Depth-Dependent Surface Analyses of 15% Vanadium Modified Lithium Iron Silicate** – Y. Zhang, X. Wei, X. Luo, and X. Cheng (Xiamen University)
- 548 **Synthesis and Electrochemical Performance of ZnO Nanorods and its Application in Silver - Zinc Secondary Battery** – V. T. Nguyen, C. D. Bui, H. T. Nguyen, H. T. Nguyen, B. H. Khuat, P. V. Mai (Institute of Chemistry and Materials), H. T. Do, and N. H. Tran (Faculty of Chemistry, Thai Nguyen University of Education)
- 549 **Investigation of the Influence of Compression of the Cell on Capacity Fade and Homogeneity of Lithium Distribution** – M. Lewerenz (Technische Hochschule Ingolstadt), C. Rahe (HI MS, IEK-12, Forschungszentrum Jülich), C. Endisch (Technische Hochschule Ingolstadt), and D. U. Sauer (Juelich Aachen Research Alliance, JARA-Energy, Germany)
- 550 **Four-Electrode Setup for Electrochemical Impedance Spectroscopy Study of Lithium-Sulfur Batteries** – J. Fang, S. Ghashghaie, H. K. Shahzad, and C. Y. Chung (City University of Hong Kong)

A06

Battery Safety and Failure Modes

Battery / Industrial Electrochemistry and Electrochemical Engineering
State Room 1, Dallas Sheraton Convention Center

Characterizing Battery Safety with Advanced Calorimetry Techniques 1 – 08:00 – 12:00

Chair(s): Thomas Paul Barrera and Guangsheng Zhang

- 08:00 **Welcoming Remarks**
- 08:20 564 **(Invited) Gaining Insight into Decomposition Reactions within Energy Storage Systems: Use of Operando Isothermal Microcalorimetry** – E. S. Takeuchi (Brookhaven National Lab, Stony Brook University), A. C. Marschilok (Stony Brook University, Brookhaven National Laboratory), and K. J. Takeuchi (Stony Brook University)
- 09:00 565 **(Invited) Risk Mitigation Strategies for Combustion / Explosion from Lithium-Ion Cell Failure** – R. Spray, M. Barry, and J. Vickery (Exponent, Inc.)
- 09:40 **Break**
- 10:00 566 **(Invited) Changes in Thermal Stability of Cyclic Aged Commercial Lithium-Ion Cells** – T. Lian (Norwegian Defence Research Establishment), P. J. S. Vie (Institute for Energy Technology), M. Gilljam, and S. Forseth (Norwegian Defence Research Establishment.)

Monday, May 27

- 10:40 567 **(Invited) Correlation of Degradation Effects and the Thermal Stability of Different Active Materials in Lithium Ion Batteries** – F. Schappacher (MEET Battery Research Center, University of Münster), M. Börner (MEET Battery Research Center, University of Münster), and M. Winter (Helmholtz Institute Münster, Forschungszentrum Jülich)
- 11:20 568 **Thermal Runaway of Large Format Pouch Lithium Ion Cell with Internal Temperature Detection Using Extended Volume Accelerating Rate Calorimetry** – C. Xu (China Agricultural University, Tsinghua University), X. Feng (Tsinghua University), L. Lu (Collaborative Innovation Center of Electric Vehicles), M. Ouyang (Tsinghua University), and F. Jiang (China Agricultural University)
- 11:40 569 **Thermal Stability Study of Commercial Lithium-Ion Batteries As a Function of Cathode Chemistry and State-of-Charge** – H. Barkholtz, Y. Preger, J. Langendorf, J. Lamb, B. R. Chalamala, S. Ferreira, and S. Ivanov (Sandia National Laboratories)

Characterizing Cell Faults and Failure Modes – 13:30 – 16:00
Chair(s): Jason Morgan Porter and Ankur Jain

- 13:30 **Introductory Remarks**
- 13:40 570 **(Invited) The Role of Advanced Characterisation in Understanding the Initiation and Propagation of Failure in Li-Ion Batteries** – P. R. Shearing (Electrochemical Innovation Lab, UCL, London)
- 14:20 571 **Design Considerations for Lithium-Ion Battery Safety Used in Unique/Military Platforms** – E. Andrukaitis (Defence Research and Development Canada (DRDC))
- 14:40 572 **Safety Assessment of Solid State Batteries** – A. Masias (University of Michigan, Ford Motor Company), S. Tawfik, and J. Sakamoto (University of Michigan)
- 15:00 573 **Single-Layer Nail Penetration for Lithium-Ion Battery Safety Characterization** – S. Huang, X. Du, M. Richter, G. M. Cavalheiro, T. Iriyama, and G. Zhang (The University of Alabama in Huntsville)
- 15:20 574 **Unlocking the Safety Issues Caused By Internal Short Circuits in Lithium-Ion Batteries** – B. Liu and J. Xu (Beihang University)
- 15:40 575 **Multi-Physics Computational Model for Lithium-Ion Batteries Under Mechanical Abusive Loading** – J. Xu and B. Liu (Beihang University)

B03 Carbon Nanotubes - From Fundamentals to Devices

Nanocarbons / Physical and Analytical Electrochemistry
 City View 6, Dallas Sheraton Hotel

Nanocarbons Division Richard E. Smalley Research Award Address – 08:00 – 08:40

Chair(s): Slava V. Rotkin

- 08:00 692 **(Nanocarbons Division Richard E. Smalley Research Award Address) Multifunctional Hybrid Carbon Interfaces** – M. Prato (University of TRIESTE, CIC biomaGUNE)

Chemistry 1 – 08:40 – 09:40

Chair(s): Slava V. Rotkin

- 08:40 693 **(Invited) Learning to Predict Single-Wall Carbon Nanotube-Recognition DNA Sequences** – Y. Yang (Lehigh University), M. Zheng (National Institute of Standards and Technology), and A. Jagota (Lehigh University)
- 09:00 694 **Effect of DNA on Fundamental Characteristics of Single-Walled Carbon Nanotubes; Length Distribution and Thermal Stability** – M. M. Safaei, M. Gravelly, and D. Roxbury (University of Rhode Island)
- 09:20 695 **(Invited) Strategies for Alignment and Spatial Localization of Semiconducting Single-Walled Carbon Nanotubes** – P. Gopalan (University of Wisconsin), J. Dwyer (UW-Madison), K. R. Jenkins, and M. S. Arnold (University of Wisconsin-Madison)

Chemistry 2 – 10:00 – 12:20

Chair(s): Benjamin S. Flavel

- 10:00 696 **Tailoring the Properties of Single-Wall Carbon Nanotube Samples through Structure-Selective Photochemistry** – Y. Zheng, S. M. Bachilo, and R. B. Weisman (Rice University)
- 10:20 697 **(Invited) Microenvironment Effects on Photoluminescent Doped Sites of Locally Functionalized Single-Walled Carbon Nanotubes** – T. Shiraki (Department of Applied Chemistry, Kyushu University, WPI-I2CNER, Kyushu University), Y. Niidome, F. Toshimitsu (Department of Applied Chemistry, Kyushu University), and T. Fujigaya (Department of Applied Chemistry, Kyushu University, WPI-I2CNER, Kyushu University)
- 10:40 698 **Brightening of Long, Polymer-Wrapped Carbon Nanotubes By Large Scale sp^3 Functionalization** – F. J. Berger, J. M. Lüttgens, and J. Zaumseil (Heidelberg University, Physical Chemistry, Heidelberg University, Centre for Advanced Materials)

11:00 699 **(Invited) Controlling the Inner Dielectric Environment of Carbon Nanotubes to Tune Their Optical Properties** – S. Cambre (University of Antwerp), J. Campo (National Institute of Standards and Technology, University of Antwerp), B. Botka, W. van Werveke (University of Antwerp), J. Obrzut (NIST), W. Wenseleers (University of Antwerp), and J. A. Fagan (National Institute of Standards and Technology)

11:20 700 **(Invited) Tailoring Optical and Chemical Properties of Nanotube-Based Nanohybrids** – R. Martel (Département de chimie, Université de Montréal)

11:40 701 **Fast Photo-Chemical Synthesis of Fluorescent Defects on Carbon Nanotubes** – C. W. Lin (Massachusetts Institute of Technology), S. M. Bachilo, Y. Zheng (Rice University), U. Tsedev, S. Huang (Massachusetts Institute of Technology), R. B. Weisman (Rice University), and A. M. Belcher (Massachusetts Institute of Technology)

12:00 702 **(Invited) Perylene-Based Functionalization of Carbon Nanotubes** – A. Setaro (Freie Universitaet Berlin)

Separations – 14:00 – 15:20

Chair(s): Sofie Cambre

14:00 703 **(Invited) Facile Isolation of Semiconducting Single-Walled Carbon Nanotubes By Flavin-Based Supramolecular Chemistry** – W. Hashimoto (Kyushu University), F. Toshimitsu (WPI-I2CNER, Kyushu University), J. Nishida, A. Staykov (Kyushu University), and N. Nakashima (WPI-I2CNER, Kyushu University)

14:20 704 **(Invited) Separation of Small Diameter Swcnts in 1 – 3 Steps with Aqueous Two-Phase Extraction** – H. Li (Karlsruhe Institute of Technology), G. Gordeev, O. Garrity, S. Reich (Freie Universität Berlin), and B. S. Flavel (Karlsruhe Institute of Technology)

14:40 705 **(Invited) Purification Using Atpc to Single (n,m) Species in the Large Diameter Single-Wall Carbon Nanotube Limit** – H. Li (Karlsruhe Institute of Technology), M. Zheng (National Institute of Standards and Technology), B. S. Flavel (Karlsruhe Institute of Technology), and J. A. Fagan (National Institute of Standards and Technology)

15:00 706 **(Invited) Methylene Blue Helps to Reveal Selectivity of Carbon Nanotube Affinity to Dispersing Agents** – S. M. Bachilo, Y. Zheng, and R. B. Weisman (Rice University)

Synthesis – 15:20 – 16:40

Chair(s): Antonio Setaro

15:20 707 **(Invited) In Situ Study of Cobalt-Tungsten and Cobalt Nanocrystals Under Reactive Environment** – Y. Li and F. Yang (Peking University)

15:40 708 **Synthesis and Metrology for Large-Area Applications of Single-Wall Carbon Nanotube Forests** – E. Meshot, S. J. Park, S. Buchsbaum, K. J. Wu, and F. Fornasiero (Lawrence Livermore National Laboratory)

16:00 709 **One Dimensional Van Der Waals Heterostructures Wrapped Around Single-Walled Carbon Nanotubes** – R. Xiang, T. Inoue (The University of Tokyo), and S. Maruyama (The University of Tokyo, AIST)

16:20 710 **Controlled Growth of Metal Nanoparticles on Multi-Walled Carbon Nanotubes for Chemical Sensing Applications** – C. J. Smart, S. Belli, S. Afreen, R. Muresan, and C. Waltz-Chesnaye (Vassar College)

B05 Fullerenes - Endohedral Fullerenes and Molecular Carbon

Nanocarbons

City View 7, Dallas Sheraton Hotel

Endohedral Fullerene - Structures and Properties – 08:40 – 09:40 Chair(s): Shangfeng Yang and Luis Echegoyen

08:40 768 **(Invited) Are There Still New Structural Elements in Fullerenes That Cause Violations of the IPR?** – A. L. Balch (University of California-Davis) and M. M. Olmstead (University of California, Davis)

09:00 769 **(Invited) What Determines the Composition of Fullerene Porphyrin Cocrystals?** – M. Roy, M. M. Olmstead (University of California, Davis), and A. L. Balch (University of California-Davis)

09:20 770 **(Invited) New Advances in Magnetic Properties of Endohedral Metallofullerenes** – A. A. Popov (IFW Dresden)

Exohedral Fullerenes – 10:00 – 13:00

Chair(s): Francis D'Souza and Dirk M. Guldi

10:00 771 **(Invited) Prato Addition to C₇₀: A New Adduct and Water-Soluble Derivatives** – K. Liosi and Y. Yamakoshi (ETH Zürich)

10:20 772 **(Invited) Electrochemical Reduction of [60] Fullerene-Fused Lactones to [60] Fullerene-Fused Ketones** – C. Niu (University of Science and Technology of China) and G. W. Wang (University of Science and Technology of China)

10:40 773 **(Invited) Open-Cage Fullerene C₆₀ Derivatives Encapsulating a Paramagnetic Molecule** – Y. Murata (Institute for Chemical Research, Kyoto University)

11:00 774 **(Invited) Synthesis of Benzothieno[60] Fullerenes through Fulleranyl Cation Intermediates** – Y. Matsuo, Y. Yu, and X. Y. Yang (University of Science and Technology of China)

11:20 775 **(Invited) Photoinduced Charge Separation in Several Dyads Involving Fullerenes** – M. Solà, A. J. Stasyuk, O. A. Stasyuk, and A. A. Voityuk (Universitat de Girona)

11:40 776 **(Invited) Reactivity of Endohedral Metallofullerene Anions** – F. F. Li (Huazhong University of Science and Technology)

12:00 777 **(Invited) Prato Addition to M_{3n}@C₈₀(M = Y, Gd): Mono, Bis, and Higher Adducts** – O. Semivrazhskaya, A. Safwan, and Y. Yamakoshi (ETH Zürich)

- 12:20 778 **(Invited) Self-Assemble of Supramolecular Polymers of Porphyrin-Bisfulleropyrazoline Tweezers** – R. Caballero (University of Castilla-la Mancha), F. Langa, and P. de la Cruz (Universidad de Castilla-La Mancha)
- 12:40 779 **(Invited) A Porphyrin-centered Fullerene Tetramer Containing N@C₆₀** – K. Porfyraakis (University of Oxford)

Properties and Mechanisms – 14:00 – 16:40

Chair(s): Alan L. Balch and Steven Stevenson

- 14:00 780 **(Invited) Metallofullerenes – Enabling Long-Lived Radical Ion Pair States** – D. M. Guldi (Universität Erlangen-Nürnberg)
- 14:20 781 **(Invited) Triplet Sensitizer Derived, Nanocarbon Bearing Donor-Acceptor Conjugates for High Potential, Long-Lived Charge Separation** – F. D'Souza (University of North Texas)
- 14:40 782 **(Invited) Excited State Dynamics and Ultrafast Electron Transfer in β -Iodo Substituted Bdp and ADP Donor-Acceptor Systems Featuring Fullerene.** – H. B. Gobeze, S. Shao, and F. D'Souza (University of North Texas)
- 15:00 783 **(Invited) Pristine Carbon Nanowires: Are They Five-Fold Symmetry C₉₀, C₁₀₀ and C₁₂₀ Fullerenes or [5,5] End-Capped Carbon Nanotubes?** – S. Stevenson, T. L. Seeler, R. M. Koenig, K. R. Tepper, H. M. Franklin (Purdue University - Fort Wayne), X. Liu (Virginia Tech Chemistry), X. Wang (University of California, Santa Barbara), and H. C. Dorn (Virginia Tech Chemistry)
- 15:20 784 **(Invited) Chemical Purification of Nanotubular Fullerenes: Separating Buckyballs from Buckytubes** – R. M. Koenig, K. R. Tepper, H. M. Franklin, T. L. Seeler, and S. Stevenson (Purdue University - Fort Wayne)
- 15:40 785 **(Invited) Synthesis of the Elusive Dimetallofullerenes** – F. Liu (IFW Dresden), L. Spree (IFW-Dresden), and A. A. Popov (IFW Dresden)
- 16:00 786 **(Invited) Intramolecular Reactions for Gas-Phase Formation of Carbon-Entrapped Clusterfullerenes** – P. W. Dunk, M. Mulet-Gas, C. L. Hendrickson (National High Magnetic Field Laboratory/FSU), M. R. Cerón (University of Texas at El Paso), L. Echegoyen (The University of Texas at El Paso), A. Moreno-Vicente, A. Rodriguez-Fortea (Universitat Rovira i Virgili), and J. M. Poblet (univ. rovira i virgili)
- 16:20 787 **(Invited) The Growth of Endohedral Metallofullerenes** – L. Abella, A. Rodriguez-Fortea (Universitat Rovira i Virgili), and J. M. Poblet (univ. rovira i virgili)

B06

2D Layered Materials from Fundamental Science to Applications

Nanocarbons / Dielectric Science and Technology / Electronics and Photonics / Interdisciplinary Science and Technology Subcommittee / Sensor

City View 5, Dallas Sheraton Hotel

2D Layered Materials from Fundamental Science to Applications -

Session 2 – 08:40 – 12:20

Chair(s): David Estrada

- 08:40 813 **Protons Are Transmitted across Single-Layer Graphene in Proton-Exchange-Membrane (PEM) Sandwich Structures More Than 100 Times Faster Than Other Cations** – S. Bukola (Clemson University), C. Korzeniewski (Texas Tech University), J. M. Harris (University of Utah), and S. E. Creager (Clemson University)
- 09:00 814 **Potential Applications of Layered Double Hydroxides in Membrane-Based Separation and Anti-Corrosion** – Y. Liu (Dalian University of Technology)
- 09:20 815 **(Invited) MXenes: From Fundamental Science to Emerging Applications** – N. Kurra and Y. Gogotsi (Drexel University)
- 09:40 **Break**
- 10:00 816 **Synthesis and Surface Modification of Two-Dimensional Mxenes As Potential Magnesium Battery Cathodes** – F. H. Fagerli, H. Kaland, J. Hadler-Jacobsen, L. A. Boge, S. M. Selbach (Norwegian University of Science and Technology), Z. Wang (Norwegian University of Science and Technology, SINTEF Industri), and F. Vullum-Bruer (Norwegian University of Science and Technology)
- 10:20 817 **Aerosol Jet Printing of Ti₃C₂ Mxene Aqueous Ink** – N. E. Mansoor, F. Muramutsa (Boise State University), C. E. Shuck (Drexel University), H. Subbaraman, T. Pandhi (Boise State University), Y. Gogotsi (Drexel University), and D. Estrada (Boise State University)
- 10:40 818 **Emergence of Broadband Plasmon Absorption in Gold nanoparticle-decorated Molybdenum Diselenide Nanosheets** – J. R. Dunklin (National Renewable Energy Laboratory), A. H. Rose (Boston College), H. Zhang, J. Liu (National Renewable Energy Laboratory), and J. van de Lagemaat (National Renewable Energy Laboratory)
- 11:00 819 **(Invited) Light Scattering and Emission from Hetero-Structures** – A. C. Ferrari (University of Cambridge)
- 11:20 820 **Charge Generation in Monolayer Transition Metal Dichalcogenides** – J. L. Blackburn, D. Sulas (National Renewable Energy Laboratory), S. J. Yun, Y. H. Lee (Sungkyunkwan University), D. Vigil-Fowler (National Renewable Energy Laboratory), O. Reid (University of Colorado at Boulder), and E. M. Miller (National Renewable Energy Laboratory)
- 11:40 821 **(Invited) Plasmon-Plasmon Interactions and Radiative Damping of Plasmons in Graphene Nanoribbon Arrays** – V. Perebeinos (University at Buffalo)

12:00 822 *(Invited)* (sSNOM) Imaging of 2D Encapsulated Ga Layered Metal – S. V. Rotkin (ESM Department, MRI, The Pennsylvania State University)

2D Layered Materials from Fundamental Science to Applications - Session 3 – 14:00 – 16:40

Chair(s): Vasili Perebeinos

14:00 823 **Fabrication of Top-Gate MoS₂ FET with Transferred Al₂O₃ Gate Dielectric** – T. Kawanago, T. Oba, and S. Oda (Tokyo Institute of Technology)

14:20 824 *(Invited)* 2D Materials for Cryptography – S. Das (Pennsylvania State University)

14:40 825 *(Invited)* Atomic Level Investigation of Resistance Switching in 2D Memory Devices – S. Hus, R. Ge, X. Wu, Y. Gu, J. C. Lee (The University of Texas at Austin), A. P. Li (Oak Ridge National Laboratory), and D. Akinwande (The University of Texas at Austin)

15:00 826 *(Invited)* From Field-Effect Transistors to Tunneling Devices and Resistive Random Access Memories in Two-Dimensional Van Der Waals Structures – J. Appenzeller (Electrical and Computer Engineering, Purdue University)

15:20 827 *(Invited)* Efficient Photodetection in 2D Materials and 2D/3D Heterostructures – M. C. Lemme (AMO GmbH, RWTH Aachen University)

15:40 828 *(Invited)* Electrochemically-Tunable and Low-Power 2D Synapses for Neuromorphic Computing – F. Xiong (University of Pittsburgh)

16:00 829 *(Invited)* Graphene-Based Brain Interfaces for Probing Neural Activity – D. Kuzum (University of California, San Diego)

16:20 830 **Tackling Electrons in Two-Dimensional Materials for Electronic and Energy Applications** – Y. Liu (The University of Texas at Austin)

B07

Light Energy Conversion with Metal Halide Perovskites, Semiconductor Nanostructures, and Inorganic/Organic Hybrid Materials

Nanocarbons / Physical and Analytical Electrochemistry
City View 8, Dallas Sheraton Hotel

Perovskite Photovoltaics 2 – 08:40 – 09:40

Chair(s): Lance M. Wheeler, Takashi Sagawa and Brian A. Korgel

08:40 863 *(Invited)* Dynamic Chromism in Metal Halide Perovskites – L. M. Wheeler (National Renewable Energy Laboratory)

09:00 864 *(Invited)* Metal Halide Perovskites at the Nanoscale: High Quality Optoelectronic Materials with Unique Phase Properties – J. M. Luther (National Renewable Energy Laboratory)

09:20 865 *(Invited)* (AgIn)_xZn_{2(1-x)}S₂ Quantum Dots with ZnO or TiO₂ for Inorganic/Organic Hybrid or Metal Halide Perovskite Solar Cells – T. Sagawa (Kyoto University)

Perovskite Photovoltaics 3 – 10:00 – 12:20

Chair(s): Eric Wei-Guang Diao and Brian A. Korgel

10:00 866 *(Invited)* Designing Novel Organic Small Molecular As Electron Transport Layers for Planar Perovskite Solar Cells – Q. Zhang (Nanyang Technological University)

10:20 867 *(Invited)* Perovskite Single Crystals with Free-Hole Trapping Centers for Photodetector and Solar Cell Applications – O. Mohammed (KAUST)

10:40 868 *(Invited)* Lead-Free Perovskite Solar Cells – E. W. G. Diao (National Chiao Tung University)

11:00 869 *(Invited)* Elucidating Proton Migration in Hybrid Organic Inorganic Perovskites and the Effect of Surface Passivation – D. M. Bassani, S. Sadhu (University of Bordeaux), T. Buffeteau (university of Bordeaux), and L. Hirsch (University of Bordeaux)

11:20 870 *(Invited)* Optical Investigation of Hybrid Perovskite Photophysics – M. Kuno (university of notre dame)

11:40 871 *(Invited)* Temperature-Dependent Photoluminescence and Stability of Methylammonium Lead Iodide (CH₃NH₃PbI₃) and CsPbX₃ (X=Cl, Br, I) Perovskite Nanocrystal Superlattices – Y. Zhang, C. Thomas, M. Abney (The University of Texas at Austin), and B. A. Korgel (University of Texas at Austin)

12:00 872 *(Invited)* Triplet Energy Transfer at Interfaces between Molecules and Perovskite or Metal Chalcogenide Nanostructures – J. C. Johnson, H. Lu, D. Sulas (National Renewable Energy Laboratory), J. Anthony (University of Kentucky), E. M. Miller, M. C. Beard, and J. L. Blackburn (National Renewable Energy Laboratory)

Metal/Plasmonics – 14:00 – 16:40

Chair(s): Kei Murakoshi and Stephan Link

14:00 873 **Resonance Energy Transfer in Hybrid Plasmonic-Polymetallophthalocyanine Nanoantennas Fabricated by Electropolymerization** – S. S. E. Collins, C. Flatebo, Y. Cai, S. Link, and C. F. Landes (Rice University)

14:20 874 *(Invited)* High Optical Absorbance Multilayer Film of Au and TiO₂: Charge Generation Dynamics Under Plasmon Excitation – A. Furube (Tokushima Univ.), T. Takahata (Tokushima University), and S. Yanagiya (Tokushima Univ.)

14:40 875 *(Invited)* Single Nanoelectrode Photodissolution Mechanisms – C. F. Landes (Rice University)

15:00 876 *(Invited)* Novel Plasmonic Nanomaterials for Near Infrared Light Energy Conversion – T. Teranishi (Kyoto University)

15:20 877 *(Invited)* Multi-Electron Harvesting and Catalysis Using Plasmonic Nanoparticles: A Mechanistic Understanding – P. K. Jain (UIUC)

- 15:40 **878** *(Invited)* **Enhanced Water Splitting Under Modal Strong Coupling Conditions** – H. Misawa (Hokkaido University, National Chiao Tung University)
- 16:00 **879** *(Invited)* **Single Particle Spectro-Electrochemistry** – S. Link (Rice University)
- 16:20 **880** **Electrochemical Investigation of Graphene Compositied Plasmonic Photo Conversion Electrode** – S. Suzuki, K. Yasuda, H. Minamimoto, and K. Murakoshi (Hokkaido University)

- 11:40 **983** **Biodegradable Mg: Controlling the Corrosion Behavior By Biocompatible Coatings** – S. Virtanen (FAU, Institute of Surface Science and Corrosion)

Electrochemical Methods and Corrosion Mechanisms – 13:00 – 16:00
Chair(s): Masayuki Itagaki and Dev Chidambaram

- 13:00 **984** **Dissolution Mechanisms of Mg Investigated By Various Electrochemical Methods** – M. Itagaki, I. Shitanda, and Y. Hoshi (Tokyo University of Science)
- 13:20 **985** **Electrochemical Noise Analysis of Aluminum Alloy 6061-T6 in Laminar Flow of Seawater** – L. Veleva and G. Acosta (CINVESTAV-IPN, Merida, Applied Physics Department)
- 13:40 **986** **Electrode Scratching Technique As a Robust Way to Decouple Erosion-Corrosion Components** – A. Omirkhan (Imperial College London), T. Bos (Shell Technology Center Bangalore), G. Yang (Shell Technology Center Houston), C. Stitt, D. J. Riley, and M. P. Ryan (Imperial College London)
- 14:00 **987** **Passivation Layer Tailoring Using Laser Powder-Bed Fusion Additive Manufacturing: A Tribocorrosion Study** – T. M. Chiu and H. Castaneda (Texas A&M University)
- 14:20 **988** **Microstructure, Chemical Composition and Local Corrosion Behavior of Friction Stud Welding Joint** – Y. Gu, S. Wang, H. Gao (Beijing Institute of Petrochemical Technology), and Q. Zeng Sr. (Xi'an Jiaotong University)
- 14:40 **989** **Dynamical Measurements of Surface Transformations By Galvanic Replacement Reactions on Metal Electrode Interfaces** – Z. Schichtl, H. Mehrabi, and R. Coridan (University of Arkansas)
- 15:00 **990** **Electrochemistry Behavior and Surface Film Characterization of Fe₅₀Mn₃₀Co₁₀Cr₁₀ medium Entropy Alloy in Sulfuric Acid Solution** – Y. S. Lu, C. Y. Huang, H. W. Yen, and Y. L. Lee (National Taiwan University)
- 15:20 **991** **The Corrosion Behavior of 50-Kg As-Cast Fe₂CrNiCoNi₂Al₂Alloys** – K. M. Hsu (National Taiwan University, Department of Materials Science and Engineering) and C. S. Lin (National Taiwan University)
- 15:40 **992** **Multi-Phase Field Model of Localized Corrosion Kinetics with Corrosion Products Formation** – T. Q. Ansari (The Hong Kong Polytechnic University, Hong KONG) and S. Q. Shi (The Hong Kong Polytechnic University)

F02 **Tutorial on Industrial Electrochemistry**
Industrial Electrochemistry and Electrochemical Engineering
Pearl 5, Dallas Sheraton Hotel

Tutorial on Industrial Electrochemistry – 14:00 – 16:35
Chair(s): Gerardine G. Botte and E. J. Taylor

- 14:00 **Introductory Remarks by Gerardine G. Botte and John Harb**
- 14:05 **1098** *(Invited)* **Aqueous Amination of Carbon Fiber Surfaces for Improved Composite Properties** – M. A. Lowe, P. Vlasak, D. Bank, and R. Baumer (The Dow Chemical Company)

C02 **Corrosion General Session**
Corrosion
City View 1, Dallas Sheraton Hotel

Corrosion in Various Environments 1 – 08:10 – 12:00
Chair(s): Eiji Tada and Jamie Noel

- 08:10 **Welcoming Remarks**
- 08:15 **974** **Effect of Gap Size on Galvanic Corrosion between AA5052 Aluminum-Magnesium Alloy and SS400 Carbon Steel in Aqueous NaCl Solutions** – K. Ota, E. Tada, A. Ooi, and A. Nishikata (Tokyo Institute of Technology)
- 08:35 **975** **Influence of Cations on Atmospheric Corrosion of Hot-Dipped Galvanized Steel** – Y. Liu, A. Ooi, E. Tada, and A. Nishikata (Tokyo Institute of Technology)
- 08:55 **976** **Electrochemical Test Configurations to Study Atmospheric Corrosion** – C. Hangarter (U.S. Naval Research Laboratory), B. Gong (California State University, Fresno), R. M. Anderson, and S. A. Policastro (U.S. Naval Research Laboratory)
- 09:15 **977** **Galvanic Aluminum Bond Pad Corrosion in Copper Wire Bonded Device Assembly – Mechanism and Prevention** – O. Chyan, M. Asokan, Z. Thompson, A. Lambert, and N. Ross (University of North Texas)
- 09:35 **Break**
- 10:00 **978** **Comparative Study of Chloride and Fluoride Induced Al Pad Corrosion in Wire Bonded Packaging Assembly** – G. Issac, A. Lambert, M. Asokan, W. Yi, and O. Chyan (University of North Texas)
- 10:20 **979** **A Study on Corrosion Resistance of Electroplated Gold over Nanocrystalline Ni-W for Contact Applications** – V. Budhraj, J. Stirn, E. Hallstrom, B. Lutz, M. Brennan, and K. Deford (Smiths Interconnect)
- 10:40 **980** **Comparative Evaluation of Corrosion Effects between Nanocrystalline Silver Alloy and Tradition Gold Stacks Using Spring Probe Contacts** – V. Budhraj, J. Stirn, E. Hallstrom, B. Lutz, M. Brennan, and K. Deford (Smiths Interconnect)
- 11:00 **981** **Corrosion Behavior of AZ31B Magnesium Alloy in Potassium Nitrate and Sulfate Solutions** – C. K. Chang, C. H. Tu (National Taiwan University), and C. S. Lin (Department of Materials Science and Engineering, NTU)
- 11:20 **982** **Chemical Mechanical Polishing Implementation for Corrosion Prevention of Titanium Bio-Implants** – G. B. Basim (178 Rhines Hall) and R. Yagan (Koc University)

- 14:35 **1099** *(Invited)* **Transition from Coupon Observation to Part Processing and the Challenges in Between** – T. D. Hall, H. Garich, S. H. Vijapur (Faraday Technology, Inc.), R. Radhakrishnan (Faraday Technology), J. Xu, B. Skinn, S. Snyder, E. J. Taylor, and M. Inman (Faraday Technology, Inc.)
- 15:05 **1100** *(Invited)* **Estimation of the Onset of Mass Transfer Limitations in Pulsed Electrochemical Processes** – B. Skinn (Faraday Technology, Inc.)
- 15:35 **1101** **Effect of H₂ Plasma Modification on the Electrocatalytic Hydrogen Evolution Performance of MoS₂** – J. Hu and C. Zhang (Kunming University of Science and Technology)
- 16:05 **1102** **Novel Approach for the Electrosynthesis of Copper Nanoparticles** – K. Rudman (Indiana University), S. Hosseini (indiana university), and D. G. Peters (Indiana University)

G01 Silicon Compatible Emerging Materials, Processes, and Technologies for Advanced CMOS and Post-CMOS Applications 9
 Electronics and Photonics / Dielectric Science and Technology
 City View 2, Dallas Sheraton Hotel

Materials and Devices for Novel Non-volatile Memory Elements and Neuromorphic Computing – 08:30 – 12:00
 Chair(s): Hemanth Jagannathan and Paul J. Timans

- 08:30 **Welcoming Remarks**
- 08:40 **1164** *(Invited)* **Ferroelectric Devices for Alternative, Non-Von Neumann Computing** – A. Khan (Georgia Institute of Technology)
- 09:20 **1165** **Copper-Based 3-Terminal Synaptic Cell with Multiple Resistance Levels** – T. Todorov (IBM T.J. Watson Research Center), T. Ando, F. M. Ross, J. A. Ott, J. Tang, D. Bishop (IBM T. J. Watson Research Center), J. Collins (IBM T.J. Watson Research Center), V. Narayanan (IBM T. J. Watson Research Center), and J. Rozen (IBM T. J. Watson Research Center)
- 09:40 **Break**
- 10:00 **1166** **Study on Forming-Free Characteristic of Amorphous Carbon Oxide Reram By Controlling Cu-Filament Shape** – S. M. Jin, K. H. Kwon (Hanyang University), D. W. Kim (hanyang universtiy), H. J. Kim, H. M. Yang, J. Y. Kim, and J. G. Park (Hanyang University)
- 10:20 **1167** **Multilevel Resistive Switching in Hf-Based Rram** – B. Jain (NJIT), C. S. Huang, D. Misra (New Jersey Institute of Technology), K. Tapily (TEL Technology Centre, America, LLC), R. D. Clark (TEL Technology Center, America, LLC), S. Consiglio (TEL Technology Center), C. S. Wajda, and G. J. Leusink (TEL Technology Center, America, LLC)

- 10:40 **1168** **Non-Uniform Dielectric Selectorless Resistive Switching Memory and Reliability Determination for Low Power Array Applications** – Y. C. Chen (The University of Texas at Austin), C. C. Lin (National Nano Device Laboratories, NAR Labs, Taiwan), S. Kim (Chungbuk National University, Republic of Korea), Y. F. Chang (Intel Corporation, USA), and J. C. Lee (The University of Texas at Austin)
- 11:00 **1169** **Artificial Neuron Based on TiO₂ Cbram for Neuromorphic Computing** – D. W. Kim, K. H. Kwon, H. J. Kim, S. M. Jin, H. M. Yang, J. Y. Kim, and J. G. Park (Hanyang University)
- 11:20 **1170** **Perpendicular Spin-Transfer-Torque Magnetic Tunnel Junction Multi-Level Cell with Dual Free Layers and MgO Tunnel Barriers** – J. U. Baek, H. S. Jun, J. Y. Choi (Hanyang University), K. Kondo (SUMCO CORPORATION), and J. G. Park (Hanyang University)
- 11:40 **1171** **Thermal Properties of Non-Volatile Phase Change Memories at Device Length Scale** – K. Aryana, J. Gaskins (University of Virginia), J. Nag, M. Grobis (Western Digital), D. Olson, and P. Hopkins (University of Virginia)

Gordon E. Moore Medal for Outstanding Achievement in Solid State Science and Technology Award Address – 14:00 – 14:50
 Chair(s): Christina Bock

- 14:00 **Introductory Remarks**
- 14:10 **1172** *(Gordon E. Moore Medal for Outstanding Achievement in Solid State Science and Technology Award Address)* **Silicon-Based Photonic Integrated Circuits: The Quest for Compatible Light Sources** – D. J. Lockwood (National Research Council Canada)

Silicon Compatible Emerging Materials, Processes, and Technologies for Advanced CMOS and Post-CMOS Applications 9 – Plenary Session – 14:50 – 15:30
 Chair(s): Fred Roozeboom and Hemanth Jagannathan

- 14:50 **1173** *(Plenary)* **Emerging Memory Materials and Electrochemical Synaptic Devices for Scalable Deep Learning Acceleration** – J. Rozen (IDM Research)

Lone Star B/C, Dallas Sheraton Convention Center

G01 Poster Session – 18:00 – 20:00

- **1174** **Novel Exploration of Flat-Band Voltage Manipulation by NPT for Advanced High-k/ Metal-Gate CMOS Technology** – J. Yao (IMECAS, University of Chinese Academy of Sciences), Z. Hou (University of Chinese Academy of Sciences), Z. Wu, and H. Yin (IMECAS)
- **1175** **Enhanced Operation Characteristics for Charge Trapping Memory with Al₂O₃/HfO₂/Al₂O₃ High-κ Dielectrics and Sige Substrate** – Z. Hou (IMECAS, China, University of Chinese Academy of Sciences), J. Yao, Z. Wu, and H. Yin (IMECAS)

- 1176 **Analysis of OLED Fine Metal Mask Cleaning Process Using a Microstructure** – S. H. Lee, Y. C. Jeong, J. H. Yu, K. Y. Shin (Korea Institute of Industrial Technology), and C. R. Yoon (Deviceeng) 10:50 1264
 - 1177 **Effects of Ti Electrode on the Electrical Properties of Filament within Al₂O₃ Based Antifuse** – M. Tian (IMECAS, China, University of Chinese Academy of Sciences) and H. Zhong (IMECAS) 11:10 1265
 - 1178 **Ferroelectric Characteristics of Hf_{0.5}Zr_{0.5}O₂-Based Mfis and Mfmis Capacitors for Steep-Slope Ferroelectric Field Effect Transistor Applications** – J. Roh, H. W. Park, Y. B. Lee, S. D. Hyun, K. D. Kim, T. Moon, Y. H. Lee, B. S. Kim, B. Y. Kim, H. H. Kim, and C. S. Hwang (Seoul National University) 11:40 1266
 - 1179 **Study on Interface Engineering of TiN/SiO₂ Layers to Reduce the Parasitic Capacitance in CMOS Circuits** – S. Kim, J. Y. Bae, M. Park, Y. I. Kwon, D. H. Han, U. H. Lee, and Y. Koo (Samsung Electronics Co. Ltd) 11:50 1264
- Switching Performance up to 150°C of β -Ga₂O₃ Field-Plated Vertical Schottky Diodes for 0.3-1 a Forward Current and 300-900 V Reverse Voltage** – J. Yang, P. H. Carey IV, F. Ren (University of Florida), Y. T. Chen, Y. T. Liao (National Chiao Tung University), C. W. Chang, J. Lin (University of Florida), M. J. Tadjer (Naval Research Laboratory), S. J. Pearton (University of Florida), and A. Kuramata (Tamura Corporation and Novel Crystal Technology)
- (Invited) Halide Vapor Phase Epitaxy for b- and a-Ga₂O₃ Power Electronics Devices** – J. Leach, K. Udway, J. Rumsey, G. Dodson, H. Splawn, and K. Evans (Kyma Technologies)
- High Three-Terminal Breakdown Voltage Exfoliated β -Ga₂O₃ Nanolayer Field-Effect Transistors with Dual Field Modulating Plates** – J. Bae (Korea University), H. W. Kim, I. H. Kang (Korea Electrotechnology Research Institute), and J. Kim (Korea University)

H01 Wide Bandgap Semiconductor Materials and Devices 20

Electronics and Photonics
Austin Ballroom 1, Dallas Sheraton Hotel

Electronics and Photonics Division Award Address – 08:00 – 08:40 Chair(s): Soohwan Jang

- 08:00 1260 **(Electronics and Photonics Division Award) New Directions in GaN Electronic and Photonic Devices Enabled By Electrochemical Processes** – J. Han (Department of Electrical Engineering, Yale University)

Gallium Oxide Materials and Devices – 08:40 – 12:00 Chair(s): Marko J Tadjer and Soohwan Jang

- 08:40 1261 **(Keynote) Exploration of Process Techniques for Ga₂O₃ Based Diodes** – F. Ren, J. Yang, P. H. Carey IV, S. J. Pearton (University of Florida), M. J. Tadjer (U.S. Naval Research Laboratory), and A. Kuramata (Tamura Corporation and Novel Crystal Technology)
- 09:20 1262 **(Invited) Vertical Ga₂O₃ Transistors Fabricated By Ion Implantation Doping** – M. Higashiwaki, M. H. Wong (Nat. Inst. of Info. and Comm. Tech.), K. Goto, H. Murakami, and Y. Kumagai (Tokyo University of Agriculture and Technology)
- 09:50 **Break**
- 10:20 1263 **(Invited) B-Ga₂O₃ Traps: Materials to Devices** – A. R. Arehart, E. Farzana, J. McGlone, C. M. Jackson, and S. A. Ringel (The Ohio State University)

Ultra-Wide Bandgap Materials and Devices – 13:00 – 16:10

Chair(s): Travis J. Anderson and Soohwan Jang

- 13:00 1267 **(Invited) High-Voltage β -Ga₂O₃ vertical Power Diodes and Transistors with Fin Channels** – W. Li, Z. Hu, K. Nomoto (Cornell University), R. Jinno (Kyoto University, Cornell University), T. Nakamura (Dept. of Electrical Engineering, Hosei University), D. Jena, and H. G. Xing (Cornell University)
- 13:30 1268 **Temperature-Dependent Electrical Characteristics of β -Ga₂O₃ Diodes with W Schottky Contacts up to 500°C** – C. Fares, F. Ren, and S. J. Pearton (University of Florida)
- 13:50 1269 **Thermoreflectance Temperature Mapping of Ga₂O₃ Schottky Barrier Diodes** – P. E. Raad (Southern Methodist University), P. L. Komarov (TMX Scientific, Inc.), M. J. Tadjer (U.S. Naval Research Laboratory), J. Yang, F. Ren, S. J. Pearton (University of Florida), and A. Kuramata (Tamura Corporation and Novel Crystal Technology)
- 14:20 **Break**
- 14:40 1270 **(Invited) Raman Thermography of β -Ga₂O₃ Nanomembrane FETs on Diamond** – M. J. Tadjer (U.S. Naval Research Laboratory), J. Noh (Purdue University), J. C. Culbertson (U.S. Naval Research Laboratory), S. Alajlouni, M. Si, H. Zhou, A. Shakouri, and P. D. Ye (Purdue University)
- 15:10 1271 **(Invited) Hexagonal Boron Nitride Epilayers** – H. Jiang and J. Lin (Texas Tech University)
- 15:40 1272 **(Invited) Thermal Characterization of Ultra-Wide Bandgap Gallium Oxide Electronics** – S. Choi (The Pennsylvania State University)

FET-Based Sensors – 08:00 – 12:00

Chair(s): Yu-Lin Wang and Chao-Min Cheng

- 08:00 Welcoming Remarks
- 08:10 1296 **(Invited) Graphene Based Devices for in Vitro and In Vivo Electrophysiology** – A. Offenhäuser and D. Kireev (Forschungszentrum Jülich)
- 08:40 1297 **(Invited) Detection of Heart Failure-Related Biomarker in Whole Blood with Graphene Field Effect Transistor Biosensor** – G. Zhang (Hubei University of Chinese Medicine)
- 09:10 1298 **(Invited) Electron Transport and Spin Selectivity in Nucleic Acids and Peptides** – D. H. Waldeck, E. Beall (University of Pittsburgh), and C. Clever (University of Pittsburgh)
- 09:40 Break
- 10:00 1299 **Investigation of Electrical Stability and Sensitivity of High Field Modulated Extended Gate FET Biosensors for miRNA Detection** – W. C. Kuo (NTHU) and Y. L. Wang (National Tsing Hua University)
- 10:20 1300 **Resonance-Frequency Modulation for Rapid, Point-of-Care Ebola-Glycoprotein Diagnosis with a Graphene-Based Field-Effect Biotransistor** – A. Maity, X. Sui, B. Jin, H. Pu, K. J. Bottum, X. Huang, J. Chang, G. Zhou, G. Lu, and J. Chen (University of Wisconsin-Milwaukee)
- 10:40 1301 **Detection and Analysis of Extracellular Vesicles in Physiological Salt Environment Using AlGaIn/GaN High Electron Mobility Transistor Biosensors** – A. K. Pulikkathodi, I. Sarangadharan, C. Y. Lo, P. H. Chen, C. C. Chen, and Y. L. Wang (National Tsing Hua University)
- 11:00 1302 **Effect of Electrochemically Grafted Aryl-Based Monolayer on Nonspecific Electrical Signal of Field-Effect-Transistor-Based Biosensor** – S. Himori, S. Nishitani, and T. Sakata (The University of Tokyo)
- 11:20 1303 **FET Based Heavy Metal Ion Selective Sensors for Lead Ion Detection in Whole Blood** – S. L. Wang, C. Y. Hsieh, and Y. L. Wang (National Tsing Hua University)
- 11:40 1304 **A pH/Light Dual-Modal Sensing Isfet Assisted By Artificial Neural Networks** – W. E. Hsu, Y. H. Chang (National Taiwan University), Y. J. Huang, J. C. Huang (Taiwan Semiconductor Manufacturing Company), and C. T. Lin (National Taiwan University)

Wearable and Healthcare Sensors – 13:30 – 16:00

Chair(s): Zong-Hong Lin and Dong Sung Kim

- 13:30 1305 **(Invited) Nanostructured Materials Based Sensors for Smart and Wearable Electronics** – N. E. Lee (Department of Advanced Materials Sci. & Eng., Sungkyunkwan University)

- 14:00 1306 **(Invited) Interactive Skin Display with Epidermal Stimuli Electrode** – C. Park (Dept of Materials Science Engineering, Yonsei University)
- 14:30 1307 **(Invited) Wearable Thermoelectric Generator and Refrigerator Integrated with Flexible Heat Sink** – W. Kim (Yonsei University)
- 15:00 Break
- 15:10 1308 **(Invited) Translating Paper-Based Diagnostic Devices into Clinically Relevant Applications** – C. M. Cheng (National Tsing Hua University)
- 15:40 1309 **Design Considerations of Liquid Gated High Field Modulated FET Biosensor for Enhanced Sensing Characteristics** – I. Sarangadharan, A. K. Pulikkathodi, P. H. Chen, S. L. Wang (National Tsing Hua University), W. C. Kuo (NTHU), and Y. L. Wang (National Tsing Hua University)

Lone Star B/C, Dallas Sheraton Convention Center

H02 Poster Session – 18:00 – 20:00

Chair(s): Zong-Hong Lin, Wenzhuo Wu and Yu-Lin Wang

- 1310 **Shark Skin Inspired Riblet Microstructures As a Novel Solid-Liquid Triboelectric Nanogenerator for Energy Harvesting** – C. Yeh, C. C. Liu (Tsinghua University), and Z. H. Lin (National Tsing Hua University)
- 1311 **An Ionic Polymer Actuator Capable of Simultaneously Improving Bandwidth and Blocking Force for Efficient Haptic Feedback** – H. Choi, S. Y. Kim (Dept. of Chemical Engineering, Hanyang Univ.), Y. Kim (School of Electronic Engineering, Soongsil Univ.), C. Cho (Dept. of ICMC Convergence Technology, Soongsil Univ.), H. Lee (School of Electronic Engineering, Soongsil Univ., Dept. of ICMC Convergence Technology, Soongsil Univ.), and D. H. Kim (Dept. of Chemical Engineering, Hanyang Univ.)
- 1312 **High Field Modulated Field Effect Transistors Coated By Ion Selective Membrane for Cadmium Ion Detection in Water** – C. Y. Hsieh, S. L. Wang (National Tsing Hua University), Y. T. Chen (Institute of NanoEngineering and MicroSystems), and Y. L. Wang (National Tsing Hua University)
- 1313 **Biodegradable Self-Powered Electronics and Application in Biomedical Engineering** – Z. Li (Beijing Institute of Nanoenergy and Nanosystems, CAS), Q. Zheng, H. Li, Z. Liu, W. Jiang (Beijing Institute of Nanoenergy and Nanosystems), Z. Li (Beijing Institute of Nanoenergy and Nanosystem), and H. Feng (Beijing Institute of Nanoenergy and Nanosystems)
- 1314 **Study of Stability and Reproducibility of Cardiac Troponin I Based on FET Sensor** – S. W. Huang (National Tsing Hua University)
- 1315 **A Smart Glove with Integrated Triboelectric Nanogenerator for Self-Powered Gesture Recognition and Language Expression** – Y. P. Pao, C. M. Chiu, and Z. H. Lin (National Tsing Hua University)

- 1316 **A Multicellular Structured Ionic Hybrid Pump for Ultrasensitive Mechanotransducer Skin** – Y. S. Chung, V. Amoli, J. S. Kim, S. Y. Kim, and D. H. Kim (Dept. of Chemical Engineering, Hanyang Univ.)
- 1317 **Development of the Drying Process of Antibody-Immobilized FET Sensors for Long Term Storage** – C. R. Wu, P. H. Chen, and Y. L. Wang (National Tsing Hua University)

101

Hydrogen or Oxygen Evolution Catalysis for Water Electrolysis 5

Energy Technology / Industrial Electrochemistry and Electrochemical Engineering / Physical and Analytical Electrochemistry
State Room 2, Dallas Sheraton Convention Center

Keynote Lectures – 08:25 – 09:50

Chair(s): Hui Xu and Nemanja Danilovic

- 08:25 1389 **(Invited) Hydrogen Overview and AWSM Project Updates** – H. N. Dinh (National Renewable Energy Laboratory), D. Peterson, K. Randolph (U.S. Department of Energy), A. Z. Weber (Lawrence Berkeley National Laboratory), A. H. McDaniel (Sandia National Labs), R. Boardman (Idaho National Laboratory), T. Ogitsu (Lawrence Livermore National Laboratory), D. L. Anton (Savannah River National Laboratory), J. Vickers, and E. L. Miller (U.S. Department of Energy)
- 09:00 1390 **(Invited) Development of Standards and Best Practices for Materials Testing in Low Temperature Electrolysis** – K. E. Ayers, C. B. Capuano, A. R. Motz, and P. Mani (Nel Hydrogen)
- 09:35 **Introductory Remarks**
- Alkaline Electrolysis-HER 2 – 09:50 – 12:20**
Chair(s): Sanjeev Mukerjee and Nemanja Danilovic
- 09:50 1391 **“Inverse Strain Effect in Atomic Scale” - Enhanced Hydrogen Evolution Activity and Durability in Cu Substituted Binary Chalcogenide** – S. C. Sarma, V. Mishra, K. A. A. Mary, S. Roy, and S. C. Peter (Jawaharlal Nehru Centre for Advanced Scientific Research)
- 10:10 1392 **Interfacial Design of Metallic 1T-MoS₂/Carbon Nanotubes for High-Electrocatalytic Hydrogen Evolution Performance** – D. Geng and S. Jayabal (University of Science and Technology Beijing)
- 10:30 1393 **Graphene-Dot-Armored Metallic Nanosponge Catalysts for High-Performance Hydrogen Evolution Reaction** – V. T. Nguyen, N. A. Nguyen, H. Ha, H. Y. Kim, and H. S. Choi (Chungnam National University)
- 10:50 1394 **(Invited) The Cation Effects on the Alkaline HER/HOR Kinetics** – Q. Jia (Northeastern University), E. Liu (Chemistry and Chemical Biology, Northeastern University), L. Jiao, and S. Mukerjee (Northeastern University)
- 11:20 1395 **Enhancing the Hydrogen Evolution Reaction with Alloy-TiO₂ Composites** – C. Wang, Y. Zhang, and E. J. Podlaha (Clarkson University)

- 11:40 1396 **Effect of Ni/NiO Heterostructure on Hydrogen Evolution Performance in AEM Water Electrolysis: In-Operando Raman Study** – A. Y. Faid (Norwegian University of Science and Technology), A. O. Barnett (SINTEF), F. Seland, and S. Sunde (Norwegian University of Science and Technology)
- 12:00 1397 **Nirh Nanosponges As Electrocatalysts for High-Performance Hydrogen Evolution Reaction** – N. A. Nguyen, V. T. Nguyen, Y. Ali, and H. S. Choi (Chungnam National University)

Modeling/Mechanism/Characterization – 13:25 – 16:30

Chair(s): Zhenxing Feng, Pietro Papa Lopes and Pawel J. Kulesza

- 13:25 **Introductory Remarks**
- 13:30 1398 **(Invited) Activity-Stability Relationships for Water Electrolysis Electrocatalysis** – P. P. Lopes (Argonne National Laboratory), D. Strmcnik, V. Stamenkovic, and N. M. Markovic (Argonne National Laboratory)
- 14:00 1399 **Unraveling Oxygen Electrocatalysis Mechanisms and Investigating the Role of Vulcan Carbon on a Thin Film Oxygen Deficient Perovskite La_{0.6}Sr_{0.4}CoO_{3-δ}** – V. F. Mattick, X. Jin, R. E. White, and K. Huang (University of South Carolina)
- 14:20 1400 **Universal Mechanism and Rate Equation for Hydrogen Oxidation Reaction** – T. S. Zeleke (National Taiwan University of Science and Technology), M. C. Tsai (National Taiwan university of science and technology), W. N. Su (National Taiwan University of Science and Technology), and B. J. Hwang (NTUST)
- 14:40 1401 **Theoretical and Experimental Investigations in Metal-N-C Composites for Oxygen Reduction Reaction and Hydrogen Evolution Reaction at Universal Phs** – X. Qin, L. Zhang, and M. Shao (The Hong Kong University of Science and Technology)
- 15:00 1402 **Justifying the ECSA of the Pt Surface in Alkaline Solutions by Elucidating its Lower HUPD Area in Alkaline than in Acid** – L. Jiao (Chemical Engineering, Northeastern University), E. Liu, S. Mukerjee, and Q. Jia (Chemistry and Chemical Biology, Northeastern University)
- 15:20 1403 **(Invited) In Situ x-Ray Absorption Spectroscopy Studies of Catalysts for Water Spitting** – Z. Feng (Oregon State University)
- 15:50 1404 **Isotope-Labeling Studies in Water Oxidation Electrocatalysis** – S. B. Scott, J. E. Sørensen, J. Kibsgaard, and I. Chorkendorff (Technical University of Denmark)
- 16:10 1405 **A Combined a-SAXS and XAS Study of the Operando Compositional and Morphological Changes Undergone By High Surface Area IrO₂ Oxygen Evolution Electrocatalysts** – M. Povia (Paul Scherrer Institut, Electrochemistry Laboratory, Paul Scherrer Institut), J. Herranz (Electrochemistry Laboratory, Paul Scherrer Institut), D. F. Abbott (Paul Scherrer Institute), D. Lebedev (ETH Zürich), E. Fabbri (Paul Scherrer Institut), M. Nachtegaal (In situ X-Ray Spectroscopy, Paul Scherrer Institut), C. Coperet, and T. J. Schmidt (ETH Zürich)

General Electrocatalysis 2 – 08:00 – 09:40

Chair(s): Minhua Shao and Gang Wu

- 08:00 1497 **(Invited) Advanced Atomically Dispersed Metal Cathode Catalysts for Hydrogen Fuel Cells** – G. Wu (University at Buffalo, the State University of New York)
- 08:40 1498 **High Active Ultra-Low Pt Content Oxygen Reduction Reaction Catalyst Derived from Metal Organic Framework for PEMFC** – L. Chong (Argonne National Lab), J. Wen (Argonne National Laboratory), J. J. Kubal (Purdue University), M. K. Y. Chan (Center for Nanoscale Materials), J. Zou (Shanghai Jiao Tong University), J. Greeley (Purdue University), W. Ding (Shanghai Jiao Tong University), and D. J. Liu (Argonne National Laboratory)
- 09:00 1499 **Nuclear Resonance Vibrational Spectroscopy and Mössbauer Spectroscopy Studies of Atomically Dispersed (AD)⁵⁷Fe-N-C Oxygen Reduction Reaction Catalysts for Polymer Electrolyte Fuel Cells** – H. T. Chung, E. F. Holby (Los Alamos National Laboratory), S. Komini Babu (Carnegie Mellon University), J. Park, N. N. Kariuki, A. A. Farghaly (Argonne National Laboratory), J. Zhao (Advanced Photon Source, Argonne National Laboratory), W. Bi (Argonne National Laboratory, X-ray Science Division), D. A. Cullen, H. M. Meyer III (Oak Ridge National Laboratory), E. E. Alp (Argonne National Laboratory, X-ray Science Division), K. L. More (Oak Ridge National Laboratory), D. J. Myers (Argonne National Laboratory), and P. Zelenay (Los Alamos National Laboratory)
- 09:20 1500 **In Situ Mössbauer and X-Ray Absorption Spectroscopy Studies of Atomically-Dispersed Fe-N-C Oxygen Reduction Reaction Catalysts** – D. J. Myers (Argonne National Laboratory), E. E. Alp (Argonne National Laboratory, X-ray Science Division), H. T. Chung, P. Zelenay (Los Alamos National Laboratory), D. E. Brown (Northern Illinois University, Department of Physics), W. Bi (Argonne National Laboratory, X-ray Science Division), H. Mistry, A. J. Kropf, J. Park, N. N. Kariuki (Argonne National Laboratory), K. L. More, and D. A. Cullen (Oak Ridge National Laboratory)

Allen J. Bard Award Address in Electrochemical Science – 10:00 – 10:40

Chair(s): Minhua Shao

- 10:00 1501 **(Allen J. Bard Award Address in Electrochemical Science) Energy Conversion and Storage: Novel Materials and Operando Methods** – H. D. Abruña (Cornell University)

Fuel Cell Performance and Characterization 2 – 10:40 – 12:20

Chair(s): K. C. Neyerlin

- 10:40 1502 **Elucidating the Electrode/Electrolyte Interface of Anionic Exchange Membrane Electrolyzers** – I. Kendrick (Northeastern University), S. Mukerjee (Chemistry and Chemical Biology, Northeastern University), A. Z. Weber, and M. R. Gerhardt (Lawrence Berkeley National Laboratory)
- 11:00 1503 **Application of Nano-Dispersed Ionomer to Prolong Lifetime of Polymer Electrolyte Membrane Fuel Cells** – C. Y. Ahn (Center for Nanoparticle Research, IBS, Seoul National University (SNU)), S. Kim, W. Hwang (Seoul National University (SNU)), Y. H. Cho (Kangwon National University), and Y. E. Sung (Institute for Basic Science (IBS), Seoul National University (SNU))
- 11:20 1504 **Effect of Varying Co Content in PtCo Nanoparticles on the Performance of PEM Fuel Cells** – V. Yarlagadda (General Motors, Fuel Cell Activities, University of Michigan), E. Padgett (Cornell University), T. E. Moylan (General Motors), W. Gu (Global Fuel Cell Business, General Motors), R. Kukreja (General Motors), Y. Cai (Global Fuel Cell Business, General Motors), L. T. Thompson (Joint Center for Energy Storage Research (JCESR)), D. A. Muller (Cornell University), and A. Kongkanand (Global Fuel Cell Business, General Motors)
- 11:40 1505 **Green Hydrogen and Polymer Electrolyte Fuel Cells for Our Future Sustainable Growth** – K. Ota, T. Nagai, K. Matsuzawa, Y. Kuroda, S. Mitsushima, and A. Ishihara (Yokohama National University)
- 12:00 1506 **Electrode Layer Development and *in Situ* Diagnostic Characterization in Low Temperature Fuel Cells** – K. C. Neyerlin (National Renewable Energy Laboratory), T. Van Cleve (National Renewable Energy Lab), G. Wang, A. G. Star, S. Kabir, L. Osmieri (National Renewable Energy Laboratory), S. Khandavalli (National Renewable Energy Lab), M. Wang, M. Ulsh, S. A. Mauger (National Renewable Energy Laboratory), S. Medina, and S. Pylypenko (Colorado School of Mines)

General Electrocatalysis 3 – 14:00 – 16:00

Chair(s): Minhua Shao and Chao Wang

- 14:00 1507 **(Invited) Tailoring Metal Nanostructures for Energy-Efficient Electroreduction of CO₂ and O₂** – C. Wang (Johns Hopkins University)
- 14:40 1508 **(Invited) In Situ Stimulated Raman Spectroscopy of Amorphous Cobalt Oxide Catalyst during Oxygen Evolution Electrocatalysis** – C. Eom and J. Suntivich (Cornell University)
- 15:20 1509 **(Invited) Earth-Abundant Transition Metal Single Atom Electrocatalysts for Selective CO₂ Reduction in Water** – H. Wang (Rice University)

Plasmonics along with Solar Energy Conversion – 07:55 – 12:20

Chair(s): Nianqiang (Nick) Wu and Heli Wang

- 07:55 **Introductory Remarks**
- 08:00 **1604** *(Invited)* **Plasmon Resonant Amplification of Hot Electron-Driven Photocatalysis** – S. B. Cronin (University of Southern California)
- 08:30 **1605** *(Invited)* **Plasmonic Nanocrystal Composites for Photocatalytic Production of Solar Fuels** – M. Zamkov (Bowling Green State University)
- 09:00 **1606** *(Invited)* **Rational Design of Plasmonic Photocatalysts** – N. Wu (West Virginia University)
- 09:30 **Break**
- 09:50 **1607** *(Invited)* **Tuning Thermal- and Hot Electron-Driven H₂ Generation with Plasmonic TiN/Pt Antenna-Reactor Nanohybrids** – S. Rej, Š. Kment, R. Zbořil, and A. Naldoni (RCPTM, Palacký University)
- 10:20 **1608** *(Invited)* **Plasmon Excitation-Driven Reduction and Coupling of Carbon Dioxide Molecules** – P. K. Jain (UIUC)
- 10:50 **1609** *(Invited)* **Efficient Charge Generation Dynamics in Hematite Photoanodes Decorated with Gold Nanostructures** – A. Furube (Tokushima Univ.), M. Okazaki (Tokushima University), and L. Y. Chen (National Taiwan University of Science and Technology)
- 11:20 **1610** *(Invited)* **Exotic Electronic Excitation of a Single-Layer Graphene By Surface Localized Plasmons Under Electrochemical Potential Control** – J. Zhang, R. Zhou, H. Minamimoto, and K. Murakoshi (Hokkaido University)
- 11:50 **1611** *(Invited)* **Plasmon-Driven Chemical Reactions** – J. Wang (The Chinese University of Hong Kong)

Solar Fuel Generation 1 – 13:45 – 16:00

Chair(s): Eric L. Miller

- 13:45 **1612** **Hydrogenation of Carbonyl Compounds over Pd in Aqueous Phase Under Charged Conditions: Role of Organic Molecular Structure** – L. C. Meyer, U. Sanyal, D. M. Camaioni (Pacific Northwest National Laboratory), K. A. Stoerzinger (Oregon State University), O. Y. Gutiérrez Tinoco (Pacific Northwest National Laboratory), and J. A. Lercher (Technische Universität München, Pacific Northwest National Laboratory)
- 14:00 **1613** *(Invited)* **Bottom-up Engineering of Hematite Nanowire Heterostructures for Photoelectrochemical Water Splitting** – P. Tang (ICN2, CSIC & BIST) and J. Arbiol (ICREA, ICN2, CSIC & BIST)
- 14:30 **1614** *(Invited)* **Understanding Photoelectrode/Catalyst Interface for Solar Water Splitting** – D. Wang (Boston College)

- 15:00 **1615** *(Invited)* **Nanohybrids for Manipulating Solar Energy** – A. Yurtsever and D. Ma (Institut national de la recherche scientifique (INRS))
- 15:30 **1616** *(Invited)* **Single-Source Precursors for Gas Phase Deposition of Catalytic Coatings for Water Splitting Applications** – S. Mathur, L. Jürgensen, T. Fischer, J. Leduc, and A. Möllmann (University of Cologne)

Advanced Imaging and Simulation 3 - Electron and X-Ray Microscopy – 08:00 – 10:00

Chair(s): Steven McIntosh and Wilson K. S. Chiu

- 08:00 **1699** *(Invited)* **Understanding Reactions between Li or Na and MoS₂ or WS₂ By Combining TEM and Computer Modeling** – C. B. Carter, S. Tripathi, M. T. Janish, J. Wang, C. B. Carter, S. Parida, H. Patel, C. Ghosh (University of Connecticut), P. G. Kotula, K. L. Jungjohann (Sandia National Laboratories), A. Doble, C. Cook (Eagle Picher LLC), and A. M. Dongare (University of Connecticut)
- 08:40 **1700** *(Invited)* **Probing the Structure and Dynamic Behaviors of Heterogeneous Functional Materials with the Atomic Resolution in Real-Time** – X. Pan (University of California - Irvine)
- 09:20 **1701** *(Invited)* **Ex-Situ Tracking of Microstructural Evolution in Solid Oxide Cell Electrodes with Ptychographic Nanotomography** – J. R. Bowen (Technical University of Denmark), S. De Angelis (Technical University of Denmark, Paul Scherrer Institut), P. S. Jørgensen (Technical University of Denmark), E. H. R. Tsai (Brookhaven National Laboratory), M. Holler (Paul Scherrer Institut), E. Abdellahi, K. Kreka, and G. Fevola (Technical University of Denmark)

Photoelectrochemistry 1 – 10:20 – 12:20

Chair(s): Anne C. Co and Deryn Chu

- 10:20 **1702** *(Invited)* **Plasmon Resonant Photocatalysis Via Hot Electron Injection** – S. B. Cronin (University of Southern California)
- 11:00 **1703** **Hierarchically Structured Photoelectrodes Utilizing a Protected Transparent Conducting Oxide Grown Via Atomic Layer Deposition** – P. J. Reed, M. Norman, and R. Coridan (University of Arkansas)
- 11:20 **1704** **Mechanistic Control of the Galvanic Replacement Reaction of Gold on Cuprous Oxide** – J. M. Lowe and R. Coridan (University of Arkansas)
- 11:40 **1705** **Bimetallic Nanoparticles Supported on Cr₂O₃ Microspheres As Heterogeneous Photocatalysts for Light-Induced Alcohol Oxidation** – M. Belekoukia, J. Z. Y. Tan (Heriot-Watt University), J. Xuan (Loughborough University), F. Vilela, S. Garcia, and M. Maroto-Valer (Heriot-Watt University)

12:00 1706 **Top-Down Fabrication of III-V Semiconductor Nanopillars for Photoelectrochemical Water Splitting Applications** – S. K. Karuturi, P. R. Narangari, J. Butson, H. Tan, and C. Jagadish (The Australian National University)

Photoelectrochemistry 2 - Catalysts – 13:20 – 14:40

Chair(s): Boon Siang Yeo and Jacob Ross Bowen

13:20 1707 **(Invited) How Ti Modifies Oxygen Electro-Adsorption and Oxygen Evolution Reaction on IrO₂(110) and RuO₂(110) Surfaces** – D. Y. Kuo, J. N. Nelson, H. Paik, K. M. Shen, D. G. Schlom, and J. Suntivich (Cornell University)

14:00 1708 **(Invited) Precise Structure Control Enabling Efficient Water Splitting for Hydrogen Generation** – J. Li (Army Research Laboratory) and D. Chu (U.S. Army Research Laboratory)

Photoelectrochemistry 3 - CO₂ Reduction – 14:40 – 16:20

Chair(s): Jin Suntivich and Boon Siang Yeo

14:40 1709 **(Invited) Electrochemical Reduction of Carbon Dioxide: Controlling Selectivity to Formic Acid and Methanol** – B. S. Yeo (National University of Singapore)

15:20 1710 **(Invited) A Rapid Method for Detecting CO₂ Reduction Products and Local pH** – A. C. Co and F. Zhang (The Ohio State University)

16:00 1711 **Biom mineralization of Quantum Confined Nanocrystals and Heterostructures for Electrochemical Applications** – L. Spangler, A. Sadeghnejad, J. Sakizadeh, J. Cline, C. Kiely, and S. McIntosh (Lehigh University)

106

An Invited Symposium on Advances and Perspectives on Modern Polymer Electrolyte Fuel Cells – In Honor of Shimshon Gottesfeld

Energy Technology / Industrial Electrochemistry and Electrochemical Engineering / Physical and Analytical Electrochemistry

Houston Ballroom C, Dallas Sheraton Convention Center

Historical Interactions 1 – 08:00 – 12:00

Chair(s): Fernando H Garzon and Bryan S. Pivovar

08:00 **Introductory Remarks**

08:10 1782 **(Invited) Shimshon Gottesfeld, the Right Person at the Right Time (Hydrogen: how we got here)** – B. McCormick (Pajarito Powder)

08:40 1783 **(Invited) The Legacy of Shimshon Gottesfeld: Early Work on Conducting Polymers at Los Alamos** – T. Redondo (Los Alamos National Lab)

09:00 1784 **(Invited) Development of an Innovative Flat-Metal Separator Integrating the Gdl Formed Gas-Flow Channels and the Analysis As Components of PEFCs** – M. Watanabe (Fuel Cell Nanomaterials Center, University of Yamanashi), H. Yanai, and M. Nasu (Enomoto Co., Ltd.)

09:20 1785 **(Invited) Electrocatalysis of Direct Methanol Fuel Cells with a Special Reference to the Work of Shimshon Gottesfeld** – R. R. Adzic (Chemistry Department, Brookhaven National Laboratory, Senior Scientist Emeritus)

09:40 1786 **Shimshon Gottesfeld - a Pioneer of Fuel Cell Science and Catalyst of the Fuel Cell Community** – R. F. Savinell (Case Western Reserve University, Cleveland, Ohio, USA)

10:00 **Break**

10:20 1787 **(Invited) Good Food, Paper Napkins, and New Ideas: A PEM-Fuel Cell Community at Its Best** – K. D. Kreuer (Max-Planck-Institute)

10:50 1788 **(Invited) Perspective on Modeling in Proton Exchange Membrane Fuel Cells** – T. F. Fuller (School of Chemical & Biomolecular Engineering)

11:10 1789 **(Invited) The Impact of Work By Dr. Gottesfeld and Coworkers on the Commercial Introduction of the Fuel Cell Vehicle – Calling the Shots in Polymer Electrolyte Fuel Cells** – M. F. Mathias (University of Rochester)

11:30 1790 **(Invited) Electro-Osmosis in Polymer Electrolytes** – T. A. Zawodzinski Jr. (University of Tennessee-Knoxville)

Historical Interactions 2 – 13:40 – 16:00

Chair(s): Thomas A. Zawodzinski Jr.

13:40 1791 **(Invited) Hydrogen and Fuel Cells Enabled through the U.S. Department of Energy** – S. Satyapal (U.S. Department of Energy)

14:00 1792 **(Invited) What's Killing My Fuel Cell? a Retrospective on Polymer Fuel Cell Poisoning and Degradation Research** – F. H. Garzon (University of New Mexico), R. Mukundan, and R. L. Borup (Los Alamos National Laboratory)

14:20 1793 **(Invited) Materials and MEA Design Impact on the High-Current Density Performance of PEMFCs** – A. Orfanidi, G. S. Harzer, P. Madkikar (Technical University of Munich), N. Schulte (Technical University of Munich, Munich University of Applied Sciences), P. J. Rheinländer, H. A. El-Sayed (Technical University of Munich), and H. A. Gasteiger (Technical University of Munich, Chemistry department)

14:50 1794 **(Invited) Hydroxide Exchange Membrane Fuel Cells** – Y. Yan (University of Delaware)

15:20 1795 **(Invited) My First 35 Years in R&D of Polymer Electrolyte Fuel Cells** – S. Gottesfeld (Fuel Cell Consulting, inc.)

Bioelectrochemistry: From Nature-Inspired Electrochemical Systems to Electrochemical Biosensors

Organic and Biological Electrochemistry / Energy Technology / Physical and Analytical Electrochemistry / Sensor

Pearl 3, Dallas Sheraton Hotel

Bioelectrochemistry: From Nature-Inspired Electrochemical Systems to Electrochemical Biosensors - Session 1 – 08:00 – 11:40

Chair(s): James Y. Becker and Janine Mauzeroll

- 08:00 1834 **The Effect of Length of Spacer on the Anodic Oxidation of Bisamides** – J. Y. Becker (Ben-Gurion University of the Negev, Ben-Gurion University of the Negev) and T. Golub (Ben-Gurion University of the Negev)
- 08:20 1835 **Effect of Plasmon Stimulation on the Extraction of Photosynthetic Electrons from Thylakoid Membranes** – Y. J. Kim, H. Hong, J. Yun, S. I. Kim, and W. Ryu (Yonsei University)
- 08:40 1836 **Side-Selective Modification of Photosystem I Protein and Preparation of Oriented Photo-Electrochemical Films** – K. Wolfe (Vanderbilt University)
- 09:00 1837 **The Use of a Protein Scaffold to Control the Structure of Electrodes and Ionomer in Proton Exchange Membrane Electrolyzers** – N. Pramounmat, C. Kim, and J. Renner (Case Western Reserve University)
- 09:20 1838 **Scale up of Biofilm Electrodes** – A. Mohamed, S. Tutar, P. T. Ha, and H. Beyenal (Washington State University)
- 09:40 **Break**
- 10:00 1839 **Immunosensor for Early Diabetes Markers** – S. Krishnan, G. Premaratne, and J. Niroula (Oklahoma State University)
- 10:20 1840 **Development of the 2.5th Generation Biosensor for HbA1c Using Engineered Fructosyl Peptide Oxidase** – M. Hatada (Tokyo University of Agriculture and Technology, The University of North Carolina at Chapel Hill), S. Saito, W. Tsugawa (Tokyo University of Agriculture and Technology), N. Loew (The University of North Carolina at Chapel Hill, North Carolina State University), K. Ikebukuro (Tokyo University of Agriculture and Technology), and K. Sode (The University of North Carolina at Chapel Hill, North Carolina State University)
- 10:40 1841 **Development and Application of D-Serine Enzymatic Biosensors in Neuroscience Research** – J. Mauzeroll (McGill University)
- 11:00 1842 **A Protonic Biotransducer for Controlling ATP Synthesis in Mitochondria** – T. Miyake, C. Li (Waseda University), and T. Ohta (Tokyo University of Agriculture and Technology)
- 11:20 1843 **Electrochemistry of Antibiotic Hybrids: Towards the Detection and Quantification of Antibiotic Resistance** – S. Kuss, R. M. Islam (University of Manitoba), M. Sahihi (University of Isfahan), and F. Schweizer (University of Manitoba)

Bioelectrochemistry: From Nature-Inspired Electrochemical Systems to Electrochemical Biosensors- Session 2 – 14:00 – 15:40

Chair(s): Sadagopan Krishnan and Graham T. Cheek

- 14:00 1844 **Biochemical Oxygen Demand Microelectrode for Quantifying Concentration Gradients in Anaerobic Biofilms** – M. A. Elharati, A. Mohamed, and H. Beyenal (Washington State University)
- 14:20 1845 **Evaluation of Respiratory Activity IMAGE in Normal Human Epidermal Keratinocyte SHEET Using BIO-LSI** – S. Kasai (Graduate School of Eng., Tohoku institute of technology), T. Sato (Tohoku Institute of Technology), A. Prasad (Palacky University, Olomouc, Czech Republic), K. Y. Inoue, K. Ino (Grad. School of Environmental Studies, Tohoku University), H. Shiku, and T. Matsue (Tohoku University)
- 14:40 1846 **Evaluation of Respiration Activity for Diagnosis of Mastitis Using SECM** – S. Kasai (Graduate School of Eng., Tohoku institute of technology), R. Kumagai (Tohoku Institute of Technology), A. Prasad (Palacky University, Olomouc, Czech Republic), T. Honmo (Tohoku Institute of technology), and M. Kumagai (Morinokuma veterinary clinic)
- 15:00 1847 **Ultra Micro Neural Stimulation and Recording Electrodes** – A. Ghazavi, C. R. Leon (University of Texas at Dallas), and S. F. Cogan (The University of Texas at Dallas)
- 15:20 1848 **Charge Density and Charge Delivery Characteristics of Sputtered Transition Metal Oxide Films Used As Neural Stimulation and Recording Electrodes** – B. Chakraborty (University Of Texas at Dallas), A. Joshi-Imre (The University of Texas at Dallas), J. Maeng (University Of Texas at Dallas), and S. F. Cogan (The University of Texas at Dallas)

Lone Star B/C, Dallas Sheraton Convention Center

K01 Poster Session – 18:00 – 20:00

- 1849 **Bio-Inspired Nanowire Arrays As Artificial Photoreceptors for Retinal Prosthesis** – J. Tang (Stanford University)
- 1850 **Interconnection of Open Circuit Potential in Blood Plasma with Oxidative Stress Parameters in Patients with Acute Poisoning** – A. K. Evseev, M. M. Potskhveriya, I. V. Goroncharovskaya, A. Y. Simonova, E. V. Klychnikova, A. K. Shabanov (N. Sklifosovsky Research Institute of Emergency Medicine), M. M. Goldin (Glen Oaks Community College), and S. S. Petrikov (N. Sklifosovsky Research Institute of Emergency Medicine)
- 1851 **Anodic Behavior of Erythrocytes and Erythrocytes Ghosts on the Carbon Paste Electrode** – I. V. Goroncharovskaya, A. K. Evseev, A. K. Shabanov (N. Sklifosovsky Research Institute of Emergency Medicine), M. M. Goldin (Glen Oaks Community College), and S. S. Petrikov (N. Sklifosovsky Research Institute of Emergency Medicine)
- 1852 **Highly Specific Detection of Oxytocin in Saliva** – M. Rana, A. Weber, M. Manoukian, B. Dweik, and A. Argun (GINER, INC.)

- **1853** **Characterization of Ages Produced from CELLS Using SECM-ELISA** – S. Kasai (Graduate School of Eng., Tohoku Institute of Technology), Y. Takahashi, T. Sato (Tohoku Institute of Technology), and H. Hosshi (Research Institute for the Functional Peptide)
- **1854** **Characterization of Respiratory Burst By 3D CELL Chip with a through-Hole Type Electrochemical Sensing Device** – S. Kasai, Y. Sato (Tohoku Institute of Technology), A. Prasad (Palacky University, Olomouc, Czech Republic), and T. Sato (Tohoku Institute of Technology)
- **1855** **Charge Fluence As a Predictor for the Atmospheric Plasma Inactivation of E. coli Cultures** – A. Otten, M. Jaroszeski, R. Gilbert, R. Vangapattu, and A. Hoff (University of South Florida)
- **1856** **Understanding Amyloid-Beta Plaque Formation By Monitoring the Redox Activity of Copper at the Active Site** – A. L. Tabaka, E. Sanchez, D. Nashed (Lewis University), M. A. Havens (Lewis University, Department of Biology), J. J. Keleher, and D. S. Kissel (Lewis University, Department of Chemistry)

L01

Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry General Session and Grahame Award Symposium

Physical and Analytical Electrochemistry
Trinity 3, Dallas Sheraton Hotel

Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry General Session 1 – 08:20 – 12:00 Chair(s): Prantik Saha and Michael John Coughlin

- 08:20 **1885** **Holey Bismuth for Selective Electrochemical CO₂ Reduction** – C. W. Yang (KAUST), K. W. Huang (King Abdullah University of Science and Technology), V. Tung (University of California, Merced), S. Zhong, and X. Yang (KAUST)
- 08:40 **1886** **High-Yield Urea Electrochemistry Synthesis Derived from Direct CO₂ Activation in Ionic Liquid** – P. Ling, Z. Huang, W. Winchester, K. Riley, and Z. Wang (Xavier University of Louisiana)
- 09:00 **1887** **X-Ray Study of Electrochemical Stern Layer: Ordering and Layering** – Y. Liu, T. Kawaguchi (Argonne National Laboratory), M. S. Pierce (Rochester Institute of Technology), V. Komanicky (Safarik University), and H. You (Argonne National Laboratory)
- 09:20 **1888** **Potential-Induced Acid-Base Chemistry of Adsorbed Species** – H. Mantelli (Case Western Reserve University), R. A. Martinez-Hincapie, J. Feliu (Instituto de Electroquímica, Universidad de Alicante), and D. Scherson (Case Western Reserve University)
- 09:40 **Break**

- 10:00 **1889** **Combined Electrokinetic and Electrochemical Measurements to Study the Electric Double Layer at Electrode-Electrolyte Interface** – P. Saha, A. Truong (University of California, Irvine), C. Nam, M. Hickner (The Pennsylvania State University), and I. V. Zenyuk (University of California Irvine)
- 10:20 **1890** **Development of a Simple Analysis Method for Determining Ion Transport Properties in Electrolytes** – J. Okagaki, H. Matsuda (AIST), H. Daiguji, and T. Kudo (The University of Tokyo)
- 10:40 **1891** **Monolayer Effects on Surface Plasmon Resonance of Au Thin Films** – C. Artur, M. Yarali, K. Ahmadi, X. Shan, and S. Brankovic (University of Houston)
- 11:00 **1892** **Nonlinear Time Series Analysis of Nickel in Sulfuric Acid** – D. Q. Clark and D. O. Wipf (Mississippi State University)
- 11:20 **1893** **Piezoelectric Electric Supports Modulate the Reactivity of Platinum Thin Films** – M. J. Coughlin (University of Illinois at Urbana-Champaign), B. H. Simpson (California Institute of Technology, University of Illinois at Urbana-Champaign), and J. Rodriguez-Lopez (University of Illinois at Urbana-Champaign)
- 11:40 **1894** **The Mechanism of Electrochemical Oxidation of Sulphite on Gold Nanoparticles** – X. Cai, J. S. Foord, and R. G. Compton (University of Oxford)

Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry General Session 2 – 14:00 – 16:00 Chair(s): Andrew Campion Hillier

- 14:00 **1895** **Fabrication of Metamaterial Building Blocks with Selective Photoreduction of Metal Ions Followed by Electroless Plating Onto DNA Origami Templates** – M. M. Hossen, L. Bendickson, P. E. Palo, M. Nilsen-Hamilton, and A. C. Hillier (Ames Laboratory, Iowa State University)
- 14:20 **1896** **Strain Effect on Electrolytic Hydrogen Isotope Separation** – M. Hasanzadehshirazi, W. Dongjun, C. Artur, L. Grabow, and S. Brankovic (University of Houston)
- 14:40 **1897** **Effect of Capping-Agents on Performance of Copper Nickel Tin Sulfide (CNTS) Nanocrystals Based Solar Cells** – S. K. Haram (University of Mumbai, Pune University) and Y. Jadhav (Pune University)
- 15:00 **1898** **Understanding Charge-Transfer and Kinetic Processes in Particulate Photoelectrode Morphologies for Solar Water Splitting** – R. Bala Chandran (University of Michigan)
- 15:20 **1899** **Optimal Regioselectivity Control in Electrocatalytic Oxidation of Terminal Olefins** – S. Ghobadi (Virginia Commonwealth University, Center for Rational Catalyst Synthesis), T. D. Roper (Virginia Commonwealth University), B. F. Gupton (Virginia Commonwealth University, Center for Rational Catalyst Synthesis), and C. E. Castano (Virginia Commonwealth University)

- 15:40 1900 **Development of PANI/Chitosan/Ionic Liquid/Gce Based Sensor for the Simultaneous Electrochemical Quantification of Pharmaceuticals** – N. Jadon (Jiwaji University)

L03 Computational Electrochemistry 5

Physical and Analytical Electrochemistry / Energy Technology / Industrial Electrochemistry and Electrochemical Engineering
Trinity 1, Dallas Sheraton Hotel

Multiscale Modeling – 08:00 – 10:00

Chair(s): Stephen J. Paddison

- 08:00 1942 *(Invited)* **Multiscale Molecular Modeling for Polymer Electrolyte Membrane for Fuel Cell** – W. Shinoda (Nagoya University)
- 08:40 1943 *(Invited)* **Molecular Dynamics Simulations of the Ionic Conductivity: From Aqueous Electrolytes to Polymer Electrolytes** – C. Zhang, Y. Shao, H. Gudla, A. Yllö, and D. Brandell (Uppsala University)
- 09:20 1944 **A FE² Framework for Ionic Transport Modeling in the Electrolyte of a Battery Cell** – M. Zhuo, D. Grazioli (Delft University of Technology), and A. Simone (University of Padova, Delft University of Technology)
- 09:40 1945 **Modeling and Simulation of Fiber-Based Electrodes for Li-Ion Batteries** – D. Grazioli, M. Zhuo, M. Goudarzi (Delft University of Technology), and A. Simone (University of Padova, Delft University of Technology)

Classical Molecular Dynamics – 10:40 – 11:40

Chair(s): Niels Gronbech-Jensen and Stephen J. Paddison

- 10:40 1946 *(Invited)* **Structure and Dynamics in Ion-Conducting Polymers from MD Simulations** – A. L. Frischknecht (Sandia National Labs)
- 11:20 1947 **Molecular Modeling of Reaction and Diffusion Processes at Electrochemical Interfaces in Lithium Ion Batteries** – M. J. Boyer and G. S. Hwang (University of Texas at Austin)

Simulation Methods – 13:40 – 15:40

Chair(s): Stephen J. Paddison and Mark E. Tuckerman

- 13:40 1948 *(Keynote)* **Nuclear and Electronic Quantum Effects in the Chemical Dynamics of Proton Defects in Hydrogen-Bonded Liquids** – T. E. Markland (Stanford University)
- 14:40 1949 *(Keynote)* **Accurate Configurational and Kinetic Measures in Discrete-Time Langevin Dynamics** – L. F. G. Jensen (The Technical University of Denmark, University of California, Santa Barbara) and N. Gronbech-Jensen (University of California, Davis)

Lone Star B/C, Dallas Sheraton Convention Center

L03 Poster Session – 18:00 – 20:00

- 1950 **On Sulfur Reduction Mechanism in Li-S Cells. Formation of Li₂S₈** – E. Khamitov, E. Kuzmina, and V. Kolosnitsyn (Ufa Institute of Chemistry of Russian Academy of Sciences)

- 1951 **Evaluation of Changes in Bond Parameters in Sulfolane Under the Influence of Electron-Withdrawing Substituents** – A. Yasko, E. Khamitov, E. Kuzmina, and V. Kolosnitsyn (Ufa Institute of Chemistry of Russian Academy of Sciences)
- 1952 **Molecular Dynamics Simulations of Lithium Ion Battery Anode Interface in Battery Charging Process** – K. Aoyagi (TOYOTA Motor Corporation) and M. Otani (AIST)
- 1953 **Influences of Terminal Donor Unit in Dyes with D–D– π –a Architecture on the Regeneration Mechanism in DSSCs: A Computational Study** – Y. M. Hailu and J. C. Jiang (National Taiwan University of Science and Technology)

L04 Polyoxometallates and Nanostructured Metal Oxides in Efficient Electrocatalysis, Energy Conversion, and Charge Storage

Physical and Analytical Electrochemistry / Energy Technology
Trinity 2, Dallas Sheraton Hotel

Polyoxometallates and Nanostructured Metal Oxides in Efficient Electrocatalysis, Energy Conversion, and Charge Storage 1 – 10:00 – 11:50

Chair(s): Pawel J. Kulesza, Vito Di Noto, Andrew M. Herring and Iwona Agnieszka Rutkowska

- 10:00 1968 *(Keynote)* **Water-Oxidation By Polyoxometalate-Complexed Manganese-Oxide Nanocrystals: Visible-Light Driven Photoelectrocatalysis through Hierarchical Assembly** – I. A. Weinstock (Ben-Gurion University of the Negev)
- 10:40 1969 *(Keynote)* **Cathodic Electrocatalysis Mediated By Polyoxometalates: Reduction of Carbon Dioxide and Reductive Activation of Molecular Oxygen for Hydrocarbon Oxidation** – R. Neumann (Weizmann Institute of Science)
- 11:20 1970 *(Invited)* **Hybrid Polyoxometallate and Metal Oxide Based Materials of Defined Structure, Electrocatalytic Activity and Charge Storage Properties** – P. J. Kulesza and I. A. Rutkowska (University of Warsaw)

Polyoxometallates and Nanostructured Metal Oxides in Efficient Electrocatalysis, Energy Conversion, and Charge Storage 2 – 14:00 – 15:50

Chair(s): Pawel J. Kulesza and Ira A. Weinstock

- 14:00 1971 **(Keynote) Electrocatalysis on Nanostructured Metal Oxides** – D. Y. Chung (Argonne National Laboratory), P. P. Lopes (Argonne National Laboratory), D. Strmcnik, N. M. Markovic, and V. Stamenkovic (Argonne National Laboratory)
- 14:40 1972 **(Keynote) Benefits and Limitations of Metal-Oxide Supports in Proton-Exchange Membrane Fuel Cells and Water Electrolyzers** – G. Cognard, F. Claudel, L. Dubau (CNRS, LEPMI, F-38000 Grenoble, France), M. Chatenet (Grenoble INP, LEPMI, F-38000 Grenoble, France), L. Sola-Hernandez, G. Ozouf, C. Beauger (MINES ParisTech, F-06904 Sophia Antipolis, France), and F. Maillard (CNRS, LEPMI, F-38000 Grenoble, France)
- 15:20 1973 **(Invited) Nanostructured-Metal-Oxide Functionalized-Supports for Noble Metal Catalytic Nanoparticles: Enhancement of Electrooxidation of Simple Organic Fuels** – I. A. Rutkowska and P. J. Kulesza (University of Warsaw)

MO1 Sensors, Actuators, and Microsystems General Session

Sensor

Trinity 5, Dallas Sheraton Hotel

Biosensors – 14:00 – 16:00

Chair(s): Aleksandr Simonian and Larry A. Nagahara

- 14:00 1999 **(Invited) Nanomaterial-Based Electrochemical Sensors for Environmental, Food Quality, and Medical Applications** – A. Chen, V. Manikandan, and Z. Liu (University of Guelph)
- 14:40 2000 **Rapid and Low-Cost Field Detection of Marine Toxins** – A. Argun, A. Weber, M. Manoukian, M. Rana (GINER, INC.), R. Pierce, V. Lovko, and M. Henry (Mote Marine Laboratory)
- 15:00 2001 **A Novel Microbiosensor Microarray for Continuous *Ex Vivo* Monitoring of Gamma-Aminobutyric Acid in Real-Time** – M. I. Hossain (Institute for Micro-manufacturing, Louisiana Tech University), C. Tan (Institute for Micromanufacturing), P. Doughty (Louisiana Tech University), G. Dutta (Institute for Micromanufacturing), T. Murray, S. Siddiqui, L. Iasemidis, and P. U. Arumugam (Louisiana Tech University)
- 15:20 2002 **Thin Hematite Film Based Flavin Microsensor** – G. Tibbits, N. A. Wall, and H. Beyenal (Washington State University)
- 15:40 2003 **Biomedical Applications of Carbon Nanomaterial Modified Sensors: A Promising Future** – S. Chatterjee (Institute of Chemical Technology)

202

Sustainable Materials and Manufacturing 3

All Divisions / Interdisciplinary Science and Technology

Subcommittee

Pearl 2, Dallas Sheraton Hotel

Sustainable Materials and Manufacturing 3 - Session 1 – 08:30 – 11:30

Chair(s): Gerardine G. Botte, E. J. Taylor, Gregory S. Jackson and S. R. Narayan

- 08:30 2239 **(Invited) Diamond Electrodes for Electro-Chemical Synthesis** – T. Mollart and H. Zarrin (Element Six)
- 09:10 2240 **Bismuth Conversion Electrodes in Water De-Ionization: Potentials, Limitations and the Case of Nitrate Removal** – S. Shanbhag, J. Whitacre, and M. Mauter (Carnegie Mellon University)
- 09:30 **Break**
- 09:50 2241 **Thermodynamically Controlled Microstructure of Binary Alloy for Efficient Electrochemical Conversion of CO₂ to C₂H₄** – J. E. Kim, K. D. Yang, J. H. Jang, S. W. Im, J. B. Yeo, and K. T. Nam (Seoul National University)
- 10:10 2242 **Electrochemical Precipitation of Struvite in Acidic Environment** – A. Teymouri (Colorado School of Mines), L. Kékedy-Nagy, L. F. Greenlee (University of Arkansas), and A. M. Herring (Colorado School of Mines)
- 10:30 2243 **Research on Potentiostatic Accelerated Test Method for Fuel Cell Metal Bipolar Plate** – R. Zhang, H. Zhu, D. Yang, and C. Zhang (Tongji University)
- 10:50 2244 **Quantitative Analysis Effect of the Cathode Catalyst Layer in PEMFC with Various Ionomer By Protonic Resistance** – D. J. Yang (Tongji University)
- 11:10 2245 **Fluoride Electroadsorption on Activated Carbon Electrodes Modified with La(III)** – D. R. Martínez-Vargas, J. R. Rangel-Mendez, and L. F. Cházaro-Ruiz (IPICYT, A.C.)

Sustainable Materials and Manufacturing 3 - Session 2 – 14:00 – 15:20

Chair(s): John N. Harb, Katherine E. Ayers, Nianqiang (Nick) Wu and Gautam Banerjee

- 2246 **Perspectives on the Development and Evaluation of Electrode Materials for Electrochemical Deionization Processes** – S. Shanbhag, X. Liu, J. Whitacre, and M. Mauter (Carnegie Mellon University)
- 2247 **Electrodeposition of Silicon with a Liquid Gallium Cathode in Molten Salts** – G. M. Haarberg (Norwegian University of Science and Technology), T. Kato (Kyoto University), Y. Norikawa, and T. Nohira (Institute of Advanced Energy, Kyoto Univ.)
- 2248 **Exploration of Flash Sintering Mechanisms and Increase Mechanical Strength of YSZ for Dental Application** – H. W. Chan and H. Y. Chen (National Taiwan University)
- 2249 **Design Integrated Microfluidic Chips for Clinical Applications** – B. R. Li (National Chiao Tung University)

Monday, May 27

Z02 Poster Session – 18:00 – 20:00

- 2250 **Facile Synthesis of Nb₂O₅ as a Visible Light-Sensitive Photocatalyst** – R. R. Maciel Silva (Federal University of Sao Carlos), R. V. Goncalves (University of São Paulo), L. A. M. Ruotolo, and F. G. E. Nogueira (Federal University of Sao Carlos)
- 2251 **Modelling of Direct Laser Patterning of Self Assembled Monolayers (SAMs) on Cobalt-Chromium Alloy** – C. Powell and A. Mahapatro (Wichita State University, Biomedical Engineering)
- 2252 **Synthesis and Characterization of Self-Organized Oxide Layer Grown on Ti-Cu Alloys System for CO₂ Reduction** – J. de Almeida (Federal University of São Paulo, University of Texas at Arlington), S. H. Câmara (Federal University of São Paulo), R. Bertazzoli (State University of Campinas), R. G. da Silva, and C. A. Rodrigues (Federal University of São Paulo)
- 2253 **Preparation and Characterization of Electroless Deposited Fe-Ni Alloy Films** – T. Yamamoto, T. Nagayama, Y. Konno, K. Okura, and T. Nakamura (Kyoto Municipal Institute of Industrial Tech. and Culture)
- 2254 **Electroplating and Characterization of Invar Fe-Ni Alloy Films from Plating Baths Containing Organic Acids** – T. Nagayama, T. Yamamoto, and T. Nakamura (Kyoto Municipal Institute of Industrial Tech. and Culture)
- 2255 **Synthesis of CIS (Cu-In-S₂) Solar Cell Nanoparticles By Controlling the Concentration of Metal Complexes in an Aqueous Solution** – H. Takahashi (Tohoku University)

Z03**Nanoscale Electrochemical Imaging and Detection**

All Divisions / International Society of Electrochemistry (ISE)
 Pearl 1, Dallas Sheraton Hotel

Nanoscale Electrochemical Imaging and Detection 1 – 08:25 – 12:00

Chair(s): Petr Vanýsek, Tomokazu Matsue and Hoydoo You

- 08:25 **Welcoming Remarks**
- 08:30 2256 **Micropatterning of Metals by Tip Electrode Dissolution and Imaging of Oxygen Reduction Reaction Using Scanning Electrochemical Microscopy** – A. Jo (Korea Institute of Science and Technology), Y. Lee (Ewha Womans University), H. S. Park (Korea Institute of Science and Technology), and C. Lee (Ewha Womans University)
- 08:50 2257 **Revealing the Dynamics of Single-Molecule Reactions in a Single-Molecule Nanoreactor** – K. Qiu, B. Yuan, W. W. Zhang, P. Y. Wang, and Y. T. Long (East China University of Science and Technology)

- 09:10 2258 **In-Situ Imaging of Electrochemical Polymerization of Functionalized Thiophenes Using Transmission Electron Microscopy** – V. Subramanian (The University of Delaware), J. Liu (Dow AgroSciences LLC), B. Wei, and D. C. Martin (The University of Delaware)

09:30 **Break**

- 10:00 2259 **Visualization of Inhomogeneous Reactivity on Battery Material Using Scanning Electrochemical Cell Microscopy** – T. Yasufumi (Kanazawa University, JST PREST), I. Hirota (Tohoku university), D. Takamatsu (Hitachi, Ltd.), A. Kumatani (AIMR, Tohoku University), H. Shiku, and T. Matsue (Tohoku University)
- 10:20 2260 **Simultaneous SECM-AFM-Ters Mapping of Electrocatalytic Reactions on a Nanometric Scale** – A. Schechter (Department of Chemical Sciences, Ariel University), P. Subramanian, and S. Kolagatla (Ariel University)
- 10:40 2261 **Operando Atomic Force Microscopy Reveals Mechanics of Structural Water Driven Battery-to-Pseudocapacitor Transition** – R. Wang, J. B. Mitchell (North Carolina State University), Q. Gao, W. Y. Tsai (Oak Ridge National Laboratory), S. Boyd (North Carolina State University), M. Pharr (Texas A&M University), N. Balke (Oak Ridge National Laboratory), and V. Augustyn (North Carolina State University)
- 11:00 2262 **Coherent-x-Ray Imaging of Nanoparticle Alloy Electrodes and Catalysts** – H. You, Y. Liu (Argonne National Laboratory), W. Cha (Argonne National Lab), and A. Ulvestad (Argonne National Laboratory Materials science division)
- 11:20 2263 **Imaging Electrochemistry at the Nanoscale By Liquid Cell Transmission Electron Microscopy** – S. Hietzschold and L. Sepunaru (University of California, Santa Barbara)
- 11:40 2264 **Bubble Nucleation-Based Electrochemical Sensor for Detection of per- and Polyfluoroalkyl Substances (PFAS) in Water** – L. Luo and R. Ranaweera (Wayne State University)

Nanoscale Electrochemical Imaging and Detection 2 – 14:00 – 16:00

Chair(s): David E. Cliffl and Nongjian Tao

- 14:00 2265 **Electrode Stimulation: Heterogeneous Electron Transfer Reactions Induced By Modulation of Electrostatic Potentials in the Electrolyte** – Q. Han (Case Western Reserve University, Chemistry Department), N. S. Georgescu (Case Western Reserve University, Department of Chemistry), J. Gibbons, and D. Scherson (Case Western Reserve University)
- 14:20 2266 **Investigation of Cell Microenvironment Effect on Cell Behaviors Using Electrochemical Scanning Probe Microscopy** – F. Li (Xi'an Jiaotong University)

- 14:40 2267 **Scanning Electrochemical Cell Microscopy for Analysis of Solid Electrolyte Interface on Negative Electrodes in Lithium-Ion Batteries** – A. Kumatani (AIMR, Tohoku University, Tohoku University), Y. Sato (Tohoku University), Y. Takahashi (JST PREST, Kanazawa University), H. Shiku, and T. Matsue (Tohoku University)
- 15:00 2268 **Potentiometric Tip Electrodes for Improved Visualization of Galvanic Corrosion Processes Using SECM** – D. Filotás (University of Pécs), B. M. Fernández-Pérez (Universidad de La Laguna), L. Nagy, G. Nagy (University of Pécs), and R. M. Souto (Universidad de La Laguna)
- 15:20 2269 **Enhanced Electrochromic Properties of a Nickel Oxide-Alanine Film** – K. H. Wang, H. Ikeuchi, and T. Kawai (Tokyo University of Science)
- 15:40 2270 **Photoelectrochemical Microscopy of Ultrathin Liquid Junction Solar Cells** – J. Sambur and L. Wang (Colorado State University)

TUESDAY, MAY 28

Highlights

- 0830h..... Physical and Analytical Electrochemistry Division David C. Grahame Award Address – *Trinity 3, Sheraton Hotel*
- 0900h..... Industrial Electrochemistry and Electrochemical Engineering Division H. H. Dow Memorial Student Achievement Award Address – *Pearl 5, Sheraton Hotel*
- 1200h..... Annual Society Business Meeting and Luncheon – *Majestic 1, Sheraton Hotel*
- 1410h..... Dielectric Science and Technology Division Thomas D. Callinan Award Address – *City View 2, Sheraton Hotel*
- 1400h..... Technical Exhibit opens, ECS Career Expo and Resume Review – *Lone Star B/C, Sheraton Convention Center*
- 1530h..... Networking Break – *Lone Star B/C, Sheraton Convention Center*
- 1720h..... Energy Technology Division Research Award Address – *Houston Ballroom C, Sheraton Convention Center*
- 1800h..... Technical Exhibit, General and Student Poster Session – *Lone Star B/C, Sheraton Convention Center*

A01

Battery and Energy Technology Joint General Session

Energy Technology / Battery

Houston Ballroom A, Dallas Sheraton Convention Center

Advances in Batteries 1 – 08:00 – 12:00

Chair(s): Loraine Torres-Castro, Mohan Karulkar and Jie Xiao

- 08:00 47 **High Precision Characterization of Li-Ion Batteries during Extreme Fast Charging** – M. Karulkar, L. Torres-Castro, and J. Lamb (Sandia National Laboratories)
- 08:20 48 **Effect of Functional Groups on Polysulfide Trapping Properties of Complex Framework Materials (CFM) Serving As Effective Sulfur Hosts for Li – S Batteries** – P. Murugavel Shanthi (University of Pittsburgh), P. Jampani (Department of Bioengineering, University of Pittsburgh), B. Ramalinga, B. Gattu, M. K. Datta, O. I. Velikokhatnyi, and P. N. Kumta (University of Pittsburgh)
- 08:40 49 **Lead-Carbon Nanofiber Based ANODE for High Performance LI-ION Battery** – H. Pham (Missouri University of Science and Technology), S. Sarkar (Missouri University of Science and Technology, Rolla), and J. Park (Missouri University of Science and Technology)

- 09:00 **50** **Effective Nucleation Host Alloys (ENHAs): A New Materials Solution for Stable and Effective Li Metal Anodes** – P. Thanapisitikul, B. Gattu, M. K. Datta, R. Bandi, and P. N. Kumta (University of Pittsburgh)
- 09:20 **51** **Optimization of Design Parameters and Operating Conditions of Electrochemical Capacitors for High Energy and Power Performances** – I. S. Ike (University of the Witwatersrand, Johannesburg), I. J. Sigalas (DST/NRF (COE-SM), University of the Witwatersrand.), and S. E. Iyuke (School of Chemical and Metallurgical Engineering,)
- 09:40 **Break**
- 10:00 **52** **TEMPO-Modified Linear Polyethylenimine (LPEI) As Organic Radical Battery Electrode** – D. Patel (University of the Utah), M. Yuan, D. P. Hickey, S. Minter, and R. Warren (University of Utah)
- 10:20 **53** **Fluorination of Vanadium Oxy-Phosphate By Lif: Electrochemical Behavior in Li-Ion Battery** – S. Semsari Parapari (National Institute of Chemistry Slovenia, Sabanci University Turkey), J. M. Ateba Mba, E. Tchernychova (National Institute of Chemistry Slovenia), M. A. Gulgun (Sabanci University Turkey), and R. Dominko (National Institute of Chemistry Slovenia, ALISTORE – European Research Institute)
- 10:40 **54** **Linear and Non-Linear EIS Measurements on Li₂SOC1₂ Batteries** – M. A. Zabara, C. B. Uzundal, and B. Ulgut (Bilkent University)
- 11:00 **55** **Operando Study of Lithium Dendrite Growth on Graphite Andoe By EC-AFM** – C. Shen (Ningbo Institutute, Chinese Academy of Sciences)
- 11:20 **56** **Aging and Electrode Inhomogeneity in Commercial 18650 Lithium-Ion Cells during Long-Term Cycling** – H. Wang and J. Whitacre (Carnegie Mellon University)
- 11:40 **57** **A Desalination Battery Combining Cu₃[Fe(CN)₆]₂ As a Na-Storage Electrode and Bi As a Cl-Storage Electrode Enabling Membrane-Free Desalination** – D. H. Nam, M. A. Lumley, and K. S. Choi (University of Wisconsin-Madison)
- 14:40 **60** **Electrochemical Noise Measurements in Primary Lithium Batteries** – C. B. Uzundal, G. Karaoglu, and B. Ulgut (Bilkent University)
- 15:00 **61** **Electrochemically Produced Zinc Oxide Electrode in Rechargeable Alkaline Batteries** – S. Kolhekar (CUNY Energy Institute at the City College of New York), D. Turney (City University of New York), G. G. Yadav, M. Nyce, and S. Banerjee (CUNY Energy Institute at the City College of New York)
- 15:20 **62** **Ceramic Synthesis of Disordered Lithium Rich Oxyfluoride and the Impact of Their Defects in Electrochemical Performances** – J. M. Ateba Mba (National Institute of Chemistry Slovenia), I. Arcon (Institute Jozef Stefan, University of Nova Gorica Slovenia), G. Mali, E. Tchernychova (National Institute of Chemistry Slovenia), R. Witte (Karlsruhe Institute of Technology (KIT), Germany), R. Kruk (Karlsruhe Institute of Technology), and R. Dominko (ALISTORE – European Research Institute, National Institute of Chemistry Slovenia)
- 15:40 **Break**
- 16:00 **63** **Design of High Voltage All-Solid-State Batteries Based on Sulfide Electrolytes** – W. Fitzhugh and X. Li (Harvard University)
- 16:20 **64** **Application of Acoustic Emission to Study Electrochemical Energy Conversion and Storage Devices** – M. Maier, C. Tan (University College London), L. Castanheira, G. Hinds (National Physical Laboratory), P. R. Shearing (Electrochemical Innovation Lab, UCL, London), and D. J. L. Brett (University College London)
- 16:40 **65** **Conversion Reaction of Nanoporous ZnO Forstable Electrochemical Cycling of Binderless Simicroparticle Composite Anode** – D. Kim, M. Park (KAIST), S. M. Kim (KAIST, KIMM), H. C. Shim, S. Hyun (Korea Institute of Machinery and Materials (KIMM)), and S. M. Han (EEWS, KAIST)
- 17:00 **66** **Choline Chloride-Urea Deep Eutectic Solvent As Promising Electrolyte for Zinc Ion Batteries** – W. Kao-Ian and S. Kheawhom (Chulalongkorn University)
- 17:20 **67** **Anion-Dependent Perturbations in Ionic Liquid Structure Probed By High-Energy X-Ray Scattering** – R. Coulthard (Yale University), T. A. Pham (Lawrence Livermore National Laboratory), M. Zobel (University of Bayreuth), S. Buchsbaum (Lawrence Livermore National Laboratory), D. Plata (Massachusetts Institute of Technology), B. C. Wood, F. Fornasiero, and E. Meshot (Lawrence Livermore National Laboratory)
- 17:40 **68** **A Solvent-Free Approach to Lithium-Ion Battery Electrodes Using Melt-Processable Elastomeric Binders** – S. El Khakani, N. Verdier, O. Rynne, D. Ciszewski, D. Lepage (Université de Montréal), A. Prébé (Hutchinson SA), D. Ayme-Perrot (Total), A. Badia, M. Dollé, and D. Rochefort (Université de Montréal)
- Advances in Batteries 2 – 14:00 – 18:00**
Chair(s): Mohan Karulkar, Loraine Torres-Castro and Jie Xiao
- 14:00 **58** **Silicon Encapsulated All Solid-State Li-ion Microbatteries** – J. Collins, A. Afzali-Ardakani, J. Papalia, J. De Souza, T. Todorov, A. Pacquette, M. Krishnan, J. Rozen, and D. K. Sadana (IBM T.J. Watson Research Center)
- 14:20 **59** **Electroless Synthesis Approach for Cu₂O-CuO Nanowires/Whiskers on C-Felt for Lithium Ion Battery Anode Materials** – V. G. Watson, Z. Haynes (Florida A&M University), Y. D. Yeboah (FAMU-FSU College of Engineering), M. H. Weatherspoon (Florida A&M University - Florida State University), J. P. Zheng (Florida State University), and E. E. Kalu (Florida A&M University - Florida State University COE)

Lithium Ion Anodes 1 – 08:00 – 12:00

Chair(s): Charl J Jafta, Mohammad Hossein Tahmasebi and Jagjit Nanda

- 08:00 246 **Si/C Composite As an Anode Material with Ultrafast Charging Capability for Lithium Ion Batteries** – Q. He (Wanger Institute for Sustainable Energy Research (WISER), Illinois Institute of Technology), M. Ashuri (Wanger Institute for Sustainable Energy Research, Illinois Institute of Technology), Y. Liu (Center for Nanoscale Materials, Argonne National Laboratory), and L. Shaw (Illinois Institute of Technology, Wanger Institute for Sustainable Energy Research (WISER))
- 08:20 247 **Heterostructured Nanoporous Silicon Anode for High Energy Density Lithium Ion Battery** – A. D. Pathak, S. Pati, K. Sahu, and A. Mandal (Indian Institute of Technology Bhubaneswar)
- 08:40 248 **Fluorination of Mxene by Elemental F₂ as Electrode for Lithium-Ion Batteries** – C. J. Jafta (Oak Ridge National Laboratory), B. Thapaliya (University of Tennessee), H. Lyu, J. Xia, H. M. Meyer III, M. P. Paranthaman, X. G. Sun, C. A. Bridges, and S. Dai (Oak Ridge National Laboratory)
- 09:00 249 **Interdigitated Eutectic Alloy Anodes with High-Volumetric Capacity for Lithium-Ion Batteries** – B. T. Heligman, K. J. Kreder III, K. P. Scanlan, R. Sun, and A. Manthiram (University of Texas at Austin)
- 09:20 250 **Carbon Nanospheres-Encapsulated Silicon Anode from Solvent-Free Mechano Fusion Process for Ultrahigh Stable Lithium Silicon Batteries** – J. Wutthiprom, N. Phattharasupakun, K. Srimanon, and M. Sawangphruk (Vidyasirimedhi Institute of Science and Technology)
- 09:40 **Break**
- 10:00 251 **Porous Germanium Anode for Li-Ion Batteries** – A. Andreoli, S. Fugattini, P. Bernardoni, M. Boschetti, M. Gjestila, G. Mangherini, D. Vincenzi (University of Ferrara), U. Gulzar, T. Li, R. P. Zaccaria (Italian Institute of Technology), and D. Giubertoni (Bruno Kessler Foundation)
- 10:20 252 **Lithiation of Oxidised Silicon** – M. Schnabel, E. Arca, G. Teeter, C. Ban, and P. Stradins (National Renewable Energy Laboratory)
- 10:40 253 **Insights into the Phase Transformation and Degradation Mechanisms of Al and Al-Alloys for Lithium-Ion Battery Anodes** – M. H. Tahmasebi (The Hong Kong Polytechnic University), D. Kramer (Helmholtz Institute Ulm HIU), T. Zheng (The Hong Kong Polytechnic University), R. Mönig (KIT - Institute for Applied Materials), and S. T. Boles (The Hong Kong Polytechnic University)
- 11:00 254 **Temperature Influence on Silicon-Based Anodes for Li-Ion Batteries** – M. J. Piernas-Muñoz (Argonne National Lab), S. E. Trask, A. R. Dunlop, and I. Bloom (Argonne National Laboratory)

- 11:20 255 **In-Situ Dilation Observation of Si-Based Electrode Adopting the Thermally Treated Poly (amid-imide) As a Binder for Lithium Rechargeable Battery** – H. I. Park, D. G. Lee, D. J. Chung, M. Sohn, D. Youn (Hanyang University), C. Park (Next Generation Technology Center ; ILJIN Electric), and H. Kim (Hanyang University)

- 11:40 256 **New Si Nanofiber Mat Designs for Li-Ion Battery Anodes** – A. N. Mondal, R. Wycisk, P. N. Pintauro (Vanderbilt University), E. C. Self, and J. Nanda (Oak Ridge National Laboratory)

Lone Star A1, Dallas Sheraton Convention Center

Non Aqueous Electrolytes – 08:00 – 12:30

Chair(s): Wu Xu, Brett L. Lucht and Susan A. Odom

- 08:00 257 **(Invited) Electrolytes for Wide-Temperature Application Range of Lithium Ion Batteries** – B. Liu, Q. Li, M. H. Engelhard, Y. He, C. Wang, and W. Xu (Pacific Northwest National Laboratory)
- 08:30 258 **Ionic Liquid-Based Electrolytes for High-Voltage Li-Ion Batteries** – Q. Liu, W. Jiang, Y. Li, K. Z. Pupek, M. J. Piernas-Muñoz, I. Bloom, and Z. Zhang (Argonne National Laboratory)
- 08:50 259 **Li Ion Hopping Conduction in Highly Concentrated Liquid Electrolytes** – K. Dokko, D. Watanabe, Y. Ugata, M. L. Thomas, K. Ueno, and M. Watanabe (Yokohama National University)
- 09:10 260 **Generation and Evolution of Materials in the Anode Solid Electrolyte Interphase (SEI) of Lithium Ion Batteries** – B. L. Lucht (University of Rhode Island)
- 09:30 **Break**
- 09:50 261 **CuCl₂-Based Cathode Material with Incombustible Inorganic Liquid Electrolyte Towards Room-Temperature Na Rechargeable Battery** – H. Jung, A. Kim, J. Lee (Hanyang University), G. Jeong (Korea Electronics Technology Institute), Y. J. Kim (SKKU Advanced Institute of Nanotechnology (SAINT)), and H. Kim (Hanyang University)
- 10:10 262 **In Situ Controlled Syntheses of Electrolyte Additives for High Voltage Lithium Ion Batteries** – C. Liao (JCESR at Argonne National Laboratory), J. Yang (Argonne National Lab), I. A. Shkrob, Z. Zhang, A. Gutierrez, and J. R. Croy (Argonne National Laboratory)
- 10:30 263 **Ethylene Carbonate-Free Electrolytes for High-Nickel Layered Oxide Cathodes** – W. Li, A. Dolocan, J. Li, Q. Xie, and A. Manthiram (The University of Texas at Austin)
- 10:50 264 **New Electrolyte Additives for High Voltage Lithium Ion Batteries** – H. Lyu, Y. Li, C. J. Jafta, C. A. Bridges, H. M. Meyer III, A. Borisevich, M. P. Paranthaman, S. Dai, and X. G. Sun (Oak Ridge National Laboratory)
- 11:10 265 **Evaluation of the Solid Electrolyte Interphase Formed in Lithium Bis(trifluoromethylsulfonyl)Amide-Tetraglyme Solvate Ionic Liquids with Different Compositions** – Y. Katayama, N. Tachikawa, and N. Serizawa (Keio University)

- 11:30 266 **Evaluation of Tailored Phenothiazines for Overcharge Protection and Cathode Passivation in High Voltage Lithium-Ion Batteries** – S. A. Odom (University of Kentucky), C. S. Johnson, Y. Li (Argonne National Laboratory), Z. Liang (Department of Chemistry, University of Kentucky), T. M. Suduwella (University of Kentucky), N. H. Attanayake (Department of Chemistry, University of Kentucky), and A. P. Kaur (University of Kentucky)
- 11:50 267 **Electrolyte Development and Its Application for Fast Charging of Li-Ion Batteries** – Z. Du (Oak Ridge National Laboratory), X. Wu (Oak Ridge National Laboratory, Purdue University), D. L. Wood III (University of Tennessee), K. Zhao (Purdue University), and I. Belharouak (Oak Ridge National Laboratory)
- 12:10 268 **Effect of Salt Concentration in Sulfolane-Based Electrolyte on Long-Term Li Plating/Stripping Behavior** – Y. Maeyoshi, M. Kubota, H. Abe (ABRI Co., Ltd.), K. Abe (Yamaguchi University), and K. Kanamura (ABRI Co., Ltd., Tokyo Metropolitan University)
- Lithium Sulfur Batteries 3 – 13:40 – 18:20**
Chair(s): S. R. Narayanan, Weibing Xing and Ying Ma
- 13:40 269 **Sulfur Incorporated into Carbon Coated FeS₂ Nanotubes for High-Performance Lithium-Sulfur Batteries** – Z. Zeng (west virginia univerty) and X. Liu (West Virginia University)
- 14:00 270 **Intercalating Solid State Electrolyte Based Composite Electrode for Lithium-Sulfur Batteries** – A. Irshad, R. Elizalde-Segovia, B. S. Jayathilake, D. Moy (University of Southern California), E. J. Plichta, M. A. Hendrickson (Army Power Division, RDER-CCA), and S. R. Narayanan (University of Southern California)
- 14:20 271 **Enhancing the Performance of Li-S Batteries with LaLiO₂-Based Multifunctional Interlayer** – G. G. Bizunch, J. Fan, C. Sun, Y. Xiangfei, F. Xue, D. Deng, J. Lei, X. Lin, Y. Jia, J. Yang, H. Yan, X. Wang, M. Zheng, and Q. Dong (Xiamen University)
- 14:40 272 **The Reaction between Metal Disulfides Interlayer and Polysulfides in Lithium-Sulfur Batteries** – A. Paolella (Hydro-Quebec) and K. Zaghib (CETEES, HydroQuébec)
- 15:00 273 **Elucidating Interfacial Phenomena between Solid-State Electrolytes and the Sulfur-Cathode of Lithium-Sulfur Batteries** – L. E. Camacho-Forero (Department of Chemical Engineering, Texas A&M University) and P. B. Balbuena (Texas A&M University)
- 15:20 274 **The Role of Electrolyte Additives on the Stability and Electrochemical Performance of Lithium-Sulfur Batteries** – S. Duangdangchote, A. Krittayavathananon, N. Phattharasupakun, and M. Sawangphruk (Vidyasirimedhi Institute of Science and Technology)
- 15:40 275 **Surface Modification of Carbon Fiber Interlayer Via Amide Coupling Reaction for High-Performance Lithium-Sulfur Batteries: Experimental and Theoretical Investigation** – S. Kosasang, N. Ma, P. Chiochan, S. Duangdangchote, H. Gatemala, N. Chanlek, and M. Sawangphruk (Vidyasirimedhi Institute of Science and Technology)
- 16:00 276 **Computational Study of Electronic Current Effect on Sulfur Conversion Reactions Under Lean Electrolyte Conditions** – F. A. Soto, K. Hankins (Texas A&M University), and P. B. Balbuena (Texas A&M University)
- 16:20 277 **Computational Studies of Organic Sulfides for Energy Storage** – Y. Ma (University of Wisconsin-Eau Claire)
- 16:40 278 **Nanoengineered Separators for a High Energy Density, Long Cycle Life Li-S Battery** – W. Xing (ADA Technologies, Inc.)
- 17:00 279 **Sulfurized Polyacrylonitrile (SPAN): Mechanical Properties and Reduction Mechanisms of Carbonate-Based Solvents on Its Surface** – S. Perez-Beltran (Texas A&M University) and P. B. Balbuena (Texas A&M University)
- 17:20 280 **Investigating the Effect of Lewis Acid Base Interaction in Non-Stoichiometric Vanadium Oxide Based CNFs in Lithium – Sulfur Battery** – R. Pai, A. Singh, and V. Kalra (Drexel University)
- 17:40 281 **Modeling the Effect of Electrolyte-to-Sulfur Ratio in the Cathode on the Systems-Level Performance of a Li-S Battery** – N. B. Emerce (Middle East Technical University) and D. Eroglu (Bogazici University)
- 18:00 282 **A Fast-Charging Long-Life Li-S Battery Incorporating a MoO₃ nanobelt/Polypropylene Functional Separator** – C. W. Chu (Research Center for Applied Sciences, Academia Sinica), N. Kaisar (Department of Materials Science and Engineering, NTUST), S. Jou (National Taiwan University of Science and Technology), S. A. Abbas (Department of ESS, NTHU, TW), and J. Fang (Industrial Technology Research Institute)
- Lone Star A2, Dallas Sheraton Convention Center*
- Lithium Ion Anodes 2 – 14:00 – 18:00**
Chair(s): Denis Y.W. Yu, Christopher M. Lang and Derwin Lau
- 14:00 283 **Impact of Dopant Density on n-Type Crystalline Silicon Lithium Ion Battery Anode Capacity and Cycle Life** – D. Lau, S. Lim, S. Hager, Z. Ouyang, and A. Lennon (University of New South Wales)
- 14:20 284 **On the Potentialities of Lithiated Iron Hydroxisulfides for Lithium Ion Battery** – C. Mir, D. Giaume (Ecole Nationale Supérieure de Chimie de Paris), M. Chakir (Renault S.A.), and P. Barboux (Institut de Recherche de Chimie Paris- CNRS)

Aqueous Systems - Electrolytes/Electrode Materials 2 – 08:00 – 10:00
Chair(s): Wei Wang and Jagjit Nanda

- 08:00 417 **Phenazine-Based Anolyte Materials and Their Application in Aqueous Redox Flow Batteries** – A. Hollas, N. Wellala, R. Feng (Pacific Northwest National Laboratory), V. Murugesan (Joint Center for Energy Storage Research), B. Li, Z. Nie, E. Thomsen, Y. Shao, D. Reed (Pacific Northwest National Laboratory), and W. Wang (Joint Center for Energy Storage Research (JCESR))
- 08:20 418 **Promising Additives for the Stability of Vanadium Flow Battery Catholytes** – D. Oboeroceanu, N. Quill (Physics Dept., Bernal Institute, University of Limerick), D. N. Buckley, and R. P. Lynch (Physics Dept., Bernal Institute, University of Limerick, Dept. of Chem. Eng., Case Western Reserve University)
- 08:40 419 **Effect of Sodium Fluoride and Sodium Lignosulphonate Additives on Performance of the Soluble Lead Redox Flow Battery** – R. Suman, M. K. Ravikumar, N. Jaiswal, S. Patil (Indian Institute of Science - Bangalore), and A. K. Shukla (Indian Institute of Science)
- 09:00 420 **Improving Cycle Life and Active Materials Utilization for Rechargeable Alkaline Zn–MnO₂ Batteries** – M. B. Lim, M. Kelly, J. Duay, I. Kolesnichenko, and T. N. Lambert (Sandia National Laboratories)
- 09:20 421 **Nature-Derived Organic Mesomeric Electrolyte for Low Cost and High Capacity Aqueous Flow Battery** – H. Zhu (Hongli Zhu)
- 09:40 422 **Metal Complexing Agents for Low-Cost Flow Battery Electrolytes** – M. P. Marshak (University of Colorado Boulder)

Aqueous Systems - Electrolytes/Electrode Materials 3 – 10:10 – 12:20
Chair(s): Jagjit Nanda and Wei Wang

- 10:10 423 **(Invited) Advanced Redox Flow Battery Technologies** – W. Wang (Pacific Northwest National Laboratory)
- 10:50 424 **(Invited) High-Energy-Density Redox-Flow Batteries: Fundamental Redox Processes and Materials Design Strategies** – Y. C. Lu (The Chinese University of Hong Kong)
- 11:20 425 **Scalable and Efficient Electrochemical Exfoliation of Graphite Felt As High-Performance Flow Battery Electrode** – H. Zhu (Hongli Zhu)
- 11:40 426 **Coupled Thermal and Chemical Activation of Graphite Felt, to be Used As Positive Half-Cell Electrode in the Vanadium Redox Flow Batteries.** – A. Hassan (Laboratoire de Génie Chimique, University of Toulouse-III Paul Sabatier, France) and T. Tzedakis (Laboratoire de Génie Chimique, University of Toulouse-III Paul Sabatier, France)

- 14:40 285 **Solid Nano-Composite Electrolytes (nano-SCE) with Ion Conductivity Promotion at an Interfacial Ice Layer on the Mesoporous Silica Matrix** – X. Chen, K. B. Gandrud (imec), A. Sagara (Technology Innovation Division, Panasonic Corporation), B. Put (imec), M. Murata, H. Yabe, M. Tomiyama, H. Arase, Y. Kaneko, M. Shimada (Technology Innovation Division, Panasonic Corporation), J. Steele, M. Roeffaers (COK, KU-Leuven), M. Debuquoy, M. J. Mees (imec), and P. M. Vereecken (imec, Belgium and COK, KU-Leuven, Belgium)
- 15:00 286 **Li-Ion Cell Development with Advanced Anodes** – C. M. Lang, J. T. Herb, and P. D. Moran (Physical Sciences Inc.)
- 15:20 287 **Microstructural Analysis of Li-Ion Battery Graphite Anodes** – C. Norris, A. N. Mistry (Purdue University), S. A. Roberts (Sandia National Laboratories), and P. P. Mukherjee (Purdue University)
- 15:40 288 **Onion-like Synergetic Multilayer Coating for High-Stability Silicon Monoxide Anode in Lithium-Ion Batteries** – T. Tan, P. K. Lee (City University of Hong Kong), and D. Y. W. Yu (City university of Hong Kong)
- 16:00 289 **Versatile Utilizations of Cellulose Nanofibers for High-Performance Silicon Anode in Lithium-Ion Batteries** – J. M. Kim and Y. Piao (Seoul National University)
- 16:20 290 **Understanding Criteria of Cross-Linking Polymer As Effective Binder for Si-Based Lithium-Ion Battery Anodes** – S. Wang (City University of Hong Kong), J. Lei (Xi'an Jiaotong University), Q. Duan, and D. Y. W. Yu (City University of Hong Kong)
- 16:40 291 **Design of Multifunctional Binder for High-Capacity Silicon Based Anodes** – P. Cao, G. Yang, J. Nanda, and T. Saito (Oak Ridge National Laboratory)
- 17:00 292 **Surface-Modified Si Nano-Particles as New Anode Materials** – S. Jiang, B. Hu (Argonne National Laboratory), N. Neale (National Renewable Energy Lab), B. Zhao (The University of Tennessee-Knoxville), and Z. Zhang (Chemical Sciences and Engineering Division)
- 17:20 293 **The Effect of Volume Change on the Accessible Capacities of Porous Silicon-Graphite Composite Anodes** – D. J. Pereira (University of South Carolina), T. R. Garrick (General Motors), and J. W. Weidner (University of South Carolina)
- 17:40 294 **Pre-Lithiated Carbon Composite Nanofibers Anodes and Their use in Rechargeable Lithium-ion Batteries** – M. Alcoutlabi, A. Elizondo, J. Lopez, and G. Gonzalez (University of Texas, Rio Grande Valley)

12:00 427 **Hierarchical Carbon Nanofiber/Birnessite-MnO₂ Nanosheets Cathode for High Performance and Low-Cost Aqueous Rechargeable Zinc Ion Battery** – X. Chen, W. Li, and X. Liu (West Virginia University)

Aqueous Systems - Electrolytes/Electrode Materials 4 – 14:00 – 15:30
Chair(s): Bin Li and Pawel J. Kulesza

14:00 428 **(Invited) Development of Porous Structures for Electrochemical Energy Storage** – K. Y. Chan, B. Qin, M. Zhou, C. Y. V. Li, C. K. Ho, and A. A. Voskanyan (The University of Hong Kong)

14:30 429 **Performance of a Hybrid Regenerative Hydrogen-Vanadium Fuel Cell with Carbon Nanotube Electrode (CNT) Materials** – T. V. Nguyen (The University of Kansas), Y. Li, and R. Hammar (University of Kansas)

14:50 430 **Characterization of Carbon Felt Materials As Negative Electrode Material for Flow-Assisted Zn-Air Batteries** – R. M. Wittman (Oak Ridge National Laboratory) and T. A. Zawodzinski Jr. (University of Tennessee-Knoxville)

15:10 431 **Nanoparticle Surface Charge Alters Membrane Ionic Permeability** – Y. Zhang, S. Sankarasubramanian (Washington University in St. Louis), X. Li, X. Xie (Tsinghua University), and V. Ramani (Washington University in St. Louis)

Aqueous Systems - Design/Diagnostics 1 – 15:40 – 17:50
Chair(s): Pawel J. Kulesza and Bin Li

15:40 432 **(Invited) Capacity Fade and Cross-over in Redox Flow Batteries** – T. A. Zawodzinski Jr. (University of Tennessee-Knoxville), K. Lou (University of Tennessee, Knoxville, TN), R. M. Wittman (Oak Ridge National Laboratory), G. A. Goenaga (University of Tennessee-Knoxville), N. M. Cantillo (The University of Tennessee - Knoxville), and J. Peng (University of Tennessee-Knoxville)

16:10 433 **Measurement of VO²⁺ Transference Number in Nafion with Varying Concentrations of Sulfuric Acid** – J. T. Vardner, J. J. S. Edziah, and A. C. West (Columbia University)

16:30 434 **A NOVEL CELL Design of Alkaline-Based ZINC -Iodide FLOW Battery for Enhancing Energy and POWER Performance** – H. Pham, R. G. Landers, and J. Park (Missouri University of Science and Technology)

16:50 435 **In-Situ Electrode Potential Measurements in Vanadium Redox Flow Batteries** – Z. Yang and M. L. Perry (United Technologies Research Center)

17:10 436 **Optimally Engineered Flow-through Electrodes Using Automatic Design Algorithms and Additive Manufacturing** – V. A. Beck, T. H. Weisgraber, A. N. Ivanovskaya, S. Chandrasekaran, B. D. Moran, S. E. Watts (Lawrence Livermore National Laboratory), D. A. Tortorelli (University of Illinois, Lawrence Livermore National Laboratory), E. B. Duoss, J. Biener, M. Stadermann, and M. A. Worsley (Lawrence Livermore National Laboratory)

17:30 437 **Isolation of Mass Transport and Current Distribution in Vanadium Flow Batteries Via Segmented Strip Cell** – T. Y. Ertugrul, J. T. Clement, Y. Ashraf Gandomi, D. Aaron, and M. M. Mench (University of Tennessee)

A05 Battery Characterization
Battery / Physical and Analytical Electrochemistry
San Antonio Ballroom A, Dallas Sheraton Convention Center

In situ Formation and Degradation 1 – 08:10 – 12:10
Chair(s): Nagore Ortiz Vitoriano, David Mitlin, Gabriel M. Veith and Jennifer L. Schaefer

08:10 551 **(Invited) Microcalorimetry of Silicon Anodes for Lithium-Ion Batteries** – E. Allcorn, J. Langendorf, G. Nagasubramanian, and K. R. Fenton (Sandia National Laboratories)

08:40 552 **Probing Signatures of Thermal Metastability in Lithium-Ion Batteries** – A. N. Mistry, S. Perumaram Rangarajan, and P. P. Mukherjee (Purdue University)

09:00 553 **(Invited) Unravelling Solvation Phenomena in Glyme-Based Electrolytes for Na-O₂ Batteries** – N. Ortiz Vitoriano (Ikerbasque, CIC EnergiGUNE), R. L. Sacci, C. A. Bridges (Oak Ridge National Laboratory), O. Arcelus, M. Enterría, J. Carrasco (CIC EnergiGUNE), and G. M. Veith (Oak Ridge National Laboratory)

09:30 **Break**

10:00 554 **(Invited) On-Line Inductively-Coupled Plasma Mass Spectrometry Characterization of Transition Metal Dissolution in Electrochemical Environments** – D. J. Myers and N. N. Kariuki (Argonne National Laboratory)

10:30 555 **Atomic Resolution Imaging of the Cathode-Electrolyte Interface on a LiMn₂O₄ Electrode** – R. Scipioni, D. Isheim, and S. A. Barnett (Northwestern University)

10:50 556 **Developing Plasmonic Imaging Technique to Understand Battery Solid Electrolyte Interface Formation and Li Nucleation in-Situ** – X. Shan (University of Houston, ECE) and C. Yang (University of Houston)

11:10 557 **Study of Sulfur-Based Electrodes By *in Situ* Characterization Techniques** – Q. Lemarie (INSA LYON), H. Idrissi (INSA-Lyon), E. Maire (Laboratoire MATEIS, INSA-Lyon), F. Alloin (Université Grenoble Alpes -CNRS), P. X. Thivel (Univ. Grenoble Alpes, LEPMI, F-38000 Grenoble, France), and L. Roué (INRS-EMT)

11:30 558 **⁷Li Chemical Shift Imaging to Detect Microstructural Growth in All Solid-State Batteries** – L. E. Marbella (Columbia University), S. Zekoll, J. Kasemchainan (University of Oxford), S. Emge (University of Cambridge), P. G. Bruce (Department of Materials, University of Oxford), and C. P. Grey (Department of Chemistry, University of Cambridge)

11:50 559 **Investigation of Structural Changes during Long-Term Cycling of NCM-811 Used As Cathode Active Material in Li-Ion Batteries** – B. Strehle, F. Friedrich, A. T. S. Freiberg, M. Piana (Technical University of Munich), and H. A. Gasteiger (Technical University of Munich, Chemistry department)

In situ Formation and Degradation 2 – 14:00 – 15:40

Chair(s): Nagore Ortiz Vitoriano, David Mitlin, Gabriel M. Veith and Jennifer L. Schaefer

14:00 560 **(Invited) B-SnSb for Sodium Ion Battery Anodes: Phase Transformations Responsible for Enhanced Cycling Stability Revealed By in Situ TEM** – D. Mitlin (Clarkson University)

14:40 561 **Real-Time Operando SEM Investigation into Lithium Ion Battery Degradation** – A. N. Patel, F. M. Maddar, and M. J. Loveridge (University of Warwick)

15:00 562 **Battery Charakterisation Using Optical Methods** – C. Rahe (HI MS, IEK-12, Forschungszentrum Jülich)

15:20 563 **Unraveling the Underlying Redox Mechanism in Na₂FeP₂O₇ Pyrophosphate Cathode for Sodium-Ion Batteries** – R. Gond and P. Barpanda (Indian Institute of Science)

A06 Battery Safety and Failure Modes

Battery / Industrial Electrochemistry and Electrochemical Engineering
State Room 1, Dallas Sheraton Convention Center

Characterizing Battery Safety with Advanced Calorimetry Techniques 2 – 08:00 – 11:40

Chair(s): Judith A. Jeevarajan and Rengaswamy Srinivasan

08:00 **Welcoming Remarks**

08:10 576 **(Invited) A Combined Calorimetry and Modeling Approach for Safety Analysis of Large-Size Cells** – C. Yang, D. Finegan, W. Mai, and M. Keyser (National Renewable Energy Laboratory)

08:50 577 **(Invited) The Scalability of Accelerating Rate Calorimetry (ARC) with State of Charge and Capacity** – J. Lamb, L. Torres-Castro, M. Karulkar, and J. Stanley (Sandia National Laboratories)

09:30 **Break**

10:00 578 **(Invited) Influence of Cell Design Features on Low Temperature Cycling Performance and Safety Assessed with Accelerated Rate Calorimetry and Micro X-Ray Computed Tomography** – C. T. Love (U.S. Naval Research Laboratory), R. E. Carter (NRC Postdoctoral Associate), and E. J. Klein (US Naval Research Laboratory)

10:40 579 **The Comparison of Thermal Stability and Safety between Fresh and Aging Large Capacity Lithium Ion Battery with Silicon Carbon Anode** – H. Hsu (Tsinghua University), X. Liu (Tsinghua University, Argonne National Laboratory), X. Feng (Tsinghua University), L. Lu (Collaborative Innovation Center of Electric Vehicles, Tsinghua University), and M. Ouyang (Tsinghua University)

11:00 580 **Infrared Spectroscopic Study of the Thermal Stability of Alkyl Carbonate Electrolytes** – J. M. Porter (Colorado School of Mines) and N. Saqib (University of Indianapolis)

11:20 581 **Comparison of the Thermal Reaction Kinetic Parameters of Layered Li[Ni_xCo_yMn_z]O₂ Cathode Material with Different Nickel Content and Different Crystal Structure** – Y. Wang, D. Ren, H. Hsu, X. Feng (Tsinghua University), L. Lu (Collaborative Innovation Center of Electric Vehicles), and M. Ouyang (Tsinghua University)

Mechanisms of Thermal Runaway – 13:00 – 18:00

Chair(s): Summer Ferreira and Xiang Liu

13:00 **Introductory Remarks**

13:10 582 **(Invited) The Role of Internal Short Circuit during the Thermal-Induced Thermal Runaway Process of Lithium-Ion Battery** – D. Ren, X. Feng, H. Hsu, L. Lu, X. He, and M. Ouyang (Tsinghua University)

13:50 583 **(Invited) Thermal Runaway Propagation Testing of Lithium-Ion Cells Using the Transportation Standard Protocol** – J. A. Jeevarajan (Underwriter's Laboratories Inc.), S. Azam (Underwriters Laboratories Inc.), C. Lopez, and S. E. Kinyon (Stress Engineering Services Inc.)

14:30 584 **(Invited) Thermal Runaway Propagation Resistance in Lithium-Ion Batteries** – R. Srinivasan, M. E. Thomas, M. B. Airola, B. G. Carkhuff, L. J. Frizzell-Makowski, H. Alkandry, J. G. Reuster, H. N. Oguz, P. W. Green, P. A. Demirev, and L. J. Currano (Johns Hopkins University Applied Physics Laboratory)

15:10 585 **Varying Thermal Runaway Mechanism Caused By Fast Charging for High Energy Pouch Batteries** – Y. Li, X. Feng, D. Ren, M. Ouyang (Tsinghua University), and L. Lu (Collaborative Innovation Center of Electric Vehicles)

15:30 **Break**

16:00 586 **Early Detection for Li-Ion Batteries Thermal Runaway Based on Gas Sensing** – T. Cai, A. G. Stefanopoulou, and J. B. Siegel (University of Michigan)

16:20 587 **Effect of Mechanical Stress Factors on Large Format Li-Ion Cell Thermal Runaway Characteristics** – J. Graika (NASA Johnson Space Center), T. P. Barrera (LIB-X Consulting), and Y. Alobaidi (NASA Johnson Space Center)

16:40 588 **Evaluating the Thermal Runaway Propagation within a Battery Pack: The Unsolved Problems That Hinders the Consensus on the Test Profile in Electric-Vehicle-Safety Global-Technical-Regulation** – X. Feng (Tsinghua University), C. Jin (Shanghai University of Technology), F. Wang (China Automotive Technology & Research Center), X. He, and M. Ouyang (Tsinghua University)

17:00 589 **Inhibiting Thermal Runaway in Large Format Li-Ion Batteries** – G. Torres and S. S. Moganty (NOHMs Technologies)

- 17:20 590 **Early Warning of Thermal Runaway for Lithium-Ion Battery Based on Multi-Sensor Detection** – Y. Pan, X. Feng (Tsinghua University), L. Lu (Collaborative Innovation Center of Electric Vehicles), and M. Ouyang (Tsinghua University)
- 17:40 591 **Thermal Runaway Propagation within Lithium-Ion Battery Packs: Modes and Mechanisms** – Y. Jia and J. Xu (Beihang University)

Lone Star B/C, Dallas Sheraton Convention Center

A06 Poster Session – 18:00 – 20:00

- 592 **Investigation of Lithium-Ion Battery Interface Degradation Mechanism through EIS Analysis Under Various Cycling Conditions** – B. Dong, Y. Li, C. Ozkan, and M. Ozkan (University of California, Riverside)
- 593 **Thermal Runaway of Lithium-Ion Batteries: Mechanism, Modeling and Aging Effects** – D. Ren, X. Feng (Tsinghua University), X. Han (Tsinghua University), X. Liu (Tsinghua University, Argonne National Laboratory), L. Lu, X. He, and M. Ouyang (Tsinghua University)
- 594 **High-Performance Ionic Liquid Gel Polymer Electrolytes for Solid-State Lithium Metal Batteries** – X. Pan (Harbin Institute of Technology, Virginia Tech), P. Yang (Harbin Institute of Technology), and F. Lin (Department of Chemistry, Virginia Tech)

B01 to B09 Nano Poster Kick-off
Nanocarbons

City View 6, Dallas Sheraton Hotel

Nano Poster Kick-off (B01, B02, B03) – 16:00 – 18:05

City View 7, Dallas Sheraton Hotel

Nano Poster Kick-off (B04, B05, B06, B08, B09) – 16:00 – 18:15

B01 Carbon Nanostructures for Energy Conversion and Storage
Nanocarbons / Battery / Physical and Analytical Electrochemistry
Lone Star B/C, Dallas Sheraton Convention Center

B01 Poster Session – 18:00 – 20:00

- 608 **Electrochemical Exfoliation of Graphite in the Presence of Metal Complexes** – S. El Khakani and D. Bélanger (Université du Québec à Montréal)
- 609 **Hard/Soft Template Synthesis of Mesoporous TiO₂/Carbon Supports for Fuel Cells** – A. Jones (University of Ontario Institute of Technology), G. Montiel (Instituto Nacional de Tecnología Industrial), F. Viva (Comisión Nacional de Energía Atómica (CNEA)), and L. Trevani (University of Ontario Institute of Technology)

- 610 **Electrical Resistance Response of Reduced Graphene Oxide - Aramid Nanofiber Films to Bending-Induced Strain** – D. Loufakis, J. G. Boyd, J. L. Lutkenhaus, and D. Lagoudas (Texas A&M University)
- 611 **High Capacitance Supercapacitors Based on Polypyrrole and Carbon Nitride Composites** – E. Pereira, R. Gonçalves, R. Paiva (Federal University of Sao Carlos), T. Lima (Federal University of Sao Carlos, Inorganic Chem. Dept., Federal Fluminense University), and M. Paixao (Federal University of Sao Carlos)
- 612 **Graphene and Carbon Supported Manganese(IV)-Cobalt(II/III) Oxides Nanoparticles As High-Performance Electrochemical Supercapacitors** – J. Jablonskiene, J. Vaičiūnienė, V. Pakštas, G. Stalnionis, A. Drabavičius, V. Jasulaitienė, L. Tamašauskaitė-Tamašiūnaitė, and E. Norkus (Center for Physical Sciences and Technology)
- 613 **Facile Synthesis of Carbon Supported Porous Metal Oxide Nanofibers for Prospective Supercapacitor Electrodes** – H. Guo, Z. He, J. LaCoste, S. Ardoin, R. Cook, and L. Fei (University of Louisiana at Lafayette)
- 614 **Examination of High Porosity Activated Carbon Obtained from Dehydration of White Sugar (ASC) for Electrochemical Capacitor Applications** – K. O. Oyedotun, F. Barzegar, A. Mirghni, A. A. Khaleed, T. M. Masikhwa (University of Pretoria), and N. Manyala (Physics Department, University of Pretoria)
- 615 **Insight into the Effect of Cations in Ionic Liquid Electrolytes on Charge Storage Capacity of High-Performance Supercapacitors of N-Doped Graphene Aerogels** – P. Wuamprakhon, A. Krittayavathananon, and M. Sawangphruk (Vidyasirimedhi Institute of Science and Technology)
- 616 **The Effect of Embedded Dye Molecules with Conducting Polymer to Enhance the Photo-Generated Charges at the Working Electrode Toward the Performance of Solar-Capacitor Device** – B. Aljafari (University of South Florida)
- 617 **Optical Properties Alteration and Photo-Voltaic Applications of Nitrogen-Doped Graphene Quantum Dots** – M. T. Hasan (Texas Christian University), R. Gonzalez-Rodriguez (Texas Christian University Fort Worth), and A. V. Naumov (Texas Christian University)
- 618 **Electrochemically Engineered Graphite for Supercapacitor Application** – R. M. Tamgadge (Indian Institute of Technology, Delhi) and A. Shukla (Indian Institute of Technology Delhi)
- 619 **Synthesis of Rice Ball Shaped Rare Earth-Carbon Composite Electrode Material for Lithium-Ion Batteries** – S. Lee (Department of Chemistry, Sungkyunkwan University), C. Y. Park (Department of Physics, Sungkyunkwan University), and Y. Son (Department of Chemistry, Sungkyunkwan University)

- **620** **3D Porous Silver Nonwoven Mat Prepared with Cellulosic Templates and Spray Equipment for Supercapacitor Current Collectors** – Y. Jang, J. Jo, and S. H. Lee (Korea Institute of Machinery & Materials)

- 09:20 **715** **(Invited) Distinct Coating Displacement Kinetics for Single-Wall Nanotube Enantiomers** – R. B. Weisman, Y. Zheng, and S. M. Bachilo (Rice University)

B02

Carbon Nanostructures in Medicine and Biology
Nanocarbons / Organic and Biological Electrochemistry / Sensor

B02 Poster Session – 18:00 – 20:00

- **660** **Xeno Nucleic Acid Nanosensors for Enhanced Stability** – A. J. Gillen (École Polytechnique Fédérale de Lausanne), J. Kupis-Rozmyslowicz (École polytechnique fédérale de Lausanne (EPFL)), C. Gigli (Université Denis Diderot), N. Schuergers, and A. A. Boghossian (École Polytechnique Fédérale de Lausanne)
- **661** **Near-Infrared Confocal Imaging of Single-Walled Carbon Nanotube Uptake in Bacterial Cells** – A. Antonucci, N. Schuergers, V. Zubkovs, and A. A. Boghossian (École Polytechnique Fédérale de Lausanne)
- **662** **Characterization of Double-Stranded DNA on Single-Walled Carbon Nanotubes (SWCNTs)** – S. J. Wu, N. Schuergers (École Polytechnique Fédérale de Lausanne), K. H. Lin (Ecole Polytechnique Federale de Lausanne (EPFL)), A. J. Gillen (École Polytechnique Fédérale de Lausanne), C. Corminboeuf (Ecole Polytechnique Federale de Lausanne (EPFL)), and A. A. Boghossian (École Polytechnique Fédérale de Lausanne)
- **663** **Graphene Quantum Dots As Effective Formulations for Drug Delivery, Imaging, and Sensing** – E. Campbell, M. T. Hasan (Texas Christian University), R. Gonzalez-Rodriguez (Texas Christian University Fort Worth), G. R. Akkaraju, and A. V. Naumov (Texas Christian University)

Optics 1 – 10:00 – 12:20
Chair(s): François Léonard

- 10:00 **716** **(Invited) Spectroscopy of Nanocarbon Structures Synthesized in the One-Dimensional Core of Carbon Nanotubes** – W. Wenseleers, M. Martinati, S. Cambré (University of Antwerp), H. Kuzmany, L. Shi, P. Rohringer, P. Ayala, and T. Pichler (University of Vienna)
- 10:20 **717** **(Invited) Modeling Insights into Optical Properties of Functionalized Carbon Nanotubes** – S. Tretiak (Los Alamos National Laboratory)
- 10:40 **718** **(Invited) Correlations in Photon Emission from Neutral and Charged Exciton States in Functionalized Carbon Nanotubes** – A. Högele (Fakultät für Physik, Munich Quantum Center, Center for NanoScience (CeNS), LMU München)
- 11:00 **719** **(Invited) Photophysics of Carbon Nanostructures** – S. Zhao (LAC), J. Lavie (CEA), L. Rondin (LAC), L. Orcin-Chaix (Aimé Cotton laboratory), G. Rebeyre (LAC), C. Diederichs (LPA, ENS), Y. Chassagneux (CNRS), C. Voisin (Ecole Normale Supérieure), A. Narita (MPI), S. Campidelli (CEA-Saclay), and J. S. Lauret (Laboratoire Aimé Cotton, ENS Paris Saclay)
- 11:20 **720** **The Impact of Exposed Surface Area on the Response of SWCNT Optical Sensors** – A. J. Gillen (École Polytechnique Fédérale de Lausanne), D. J. Siefman (Ecole Polytechnique Federale de Lausanne (EPFL)), S. J. Wu (École Polytechnique Fédérale de Lausanne), C. Bourmaud (Ecole Polytechnique Federale de Lausanne (EPFL)), B. P. Lambert, and A. A. Boghossian (École Polytechnique Fédérale de Lausanne)
- 11:40 **721** **(Invited) Carbon Nanotube Photoluminescence Solvatochromism in Biomedicine: Spectroscopy, Imaging, and Modulation** – D. A. Heller (Weill Cornell Medicine, Cornell University, Memorial Sloan Kettering Cancer Center), H. Baker, J. Budhathoki-Uprety, C. Cupo (Memorial Sloan Kettering Cancer Center), J. Harvey (Memorial Sloan Kettering), P. V. Jena (Memorial Sloan Kettering Cancer Center), R. E. Langenbacher (Weill Cornell Medical College, Cornell University), J. Mittal (Lehigh University), D. Roxbury (University of Rhode Island), J. Shah, R. M. Williams (Memorial Sloan Kettering Cancer Center), G. Zerze (Princeton University), and M. Zheng (National Institute of Standards and Technology)
- 12:00 **722** **Multifunctional NIR-Fluorescent Carbon Nanotubes for Imaging and Sensing By Using Defect Chemistry** – N. Herrmann, F. Mann, and S. Kruss (Göttingen University)

B03

Carbon Nanotubes - From Fundamentals to Devices

Nanocarbons / Physical and Analytical Electrochemistry
City View 6, Dallas Sheraton Hotel

Chemistry 3 – 08:00 – 09:40
Chair(s): Ardemis Anoush Boghossian

- 08:00 **711** **Photochemical Patterning of Fluorescent sp³ Quantum Defects on Carbon Nanotube Thin Films** – J. Fortner, X. Wu, Z. Huang, and Y. Wang (University of Maryland)
- 08:20 **712** **(Invited) Photoexcited Electron Transfer from Semiconducting Carbon Nanotubes to Non-Fullerene Acceptors** – M. S. Arnold (University of Wisconsin - Madison)
- 08:40 **713** **(Invited) The Mechanical Bond As a Tool to Control Surface and Electronic Properties of SWNTs** – E. M. Perez (IMDEA Nanociencia)
- 09:00 **714** **(Invited) Superacid-Surfactant Exchange** – P. Wang, M. Kim, and Y. Wang (University of Maryland)

Devices 1 – 14:00 – 15:40

Chair(s): Delphine Bouilly

- 14:00 723 **(Invited) Ultra-Low Power Light Emission Via Avalanche and Sub-Avalanche Breakdown in Suspended Carbon Nanotubes** – S. B. Cronin (University of Southern California)
- 14:20 724 **(Invited) Organic/Inorganic Hybrid Interfaces with Swcnts for Energy Harvesting and Conversion** – J. L. Blackburn, D. Sulas, H. S. Kang, S. N. Habisreutinger, J. C. Johnson, A. J. Ferguson, and E. M. Miller (National Renewable Energy Laboratory)
- 14:40 725 **(Invited) Emerging Neuromorphic Devices for Carbon Nanotubes and Related Low-Dimensional Materials** – M. C. Hersam (Northwestern University)
- 15:00 726 **(Invited) Tuning Transport and Emission Properties of Sorted Carbon Nanotube Networks** – J. Zausseil (Heidelberg University, Physical Chemistry)
- 15:20 727 **Controlling Doping Profiles in Enriched Semiconducting Carbon Nanotube Networks for Novel Energy Harvesting Electronic Devices** – J. Hao, A. J. Ferguson, and J. L. Blackburn (National Renewable Energy Laboratory)

Lone Star B/C, Dallas Sheraton Convention Center

B03 Poster Session – 18:00 – 20:00

Chair(s): Anand Jagota

- 728 **Spinning-Disc Confocal Microscopy in the Second Near-Infrared Window (NIR-II)** – V. Zubkovs, A. Antonucci, N. Schuergers, B. P. Lambert (École Polytechnique Fédérale de Lausanne), A. Latini, R. Ceccarelli, A. Santinelli (CrestOptics S.p.A), A. Rogov, D. Ciepiewski (Nikon GmbH), and A. A. Boghossian (École Polytechnique Fédérale de Lausanne)
- 729 **Mediatorless, Reversible Optical Nanosensor Enabled through Enzymatic Pocket Doping** – V. Zubkovs, N. Schuergers, B. P. Lambert (École Polytechnique Fédérale de Lausanne), E. Ahunbay (Ecole Polytechnique Federale de Lausanne (EPFL)), and A. A. Boghossian (École Polytechnique Fédérale de Lausanne)
- 730 **Highly Flexible Agnw-CNT Sponge** – J. Kim (Kyungpook National University, Korea Institute of Industrial Technology (KITECH)), J. Lee (Kyungpook National University, Korea Institute of Industrial Technology (KITECH)), and D. Jung (Korea Institute of Industrial Technology (KITECH))
- 731 **The Effect of Catalyst Thickness and the Hydrogen Annealing Time on Spin Capability of Carbon Nanotube Forest with a Fast Temperature Ramping Rate CVD System** – Y. I. Choi, B. Dousti (University of Texas at Dallas), D. Jung (Korea Institute of Industrial Technology (KITECH)), and G. S. Lee (University of Texas at Dallas)

- 732 **Post-Chemical Modification of Doped Sites of Locally Functionalized Single-Walled Carbon Nanotubes for Multistep Photoluminescence Modulation** – T. Shiraki (Department of Applied Chemistry, Kyushu University, WPI-I2CNER, Kyushu University), T. Shiga (Department of Applied Chemistry, Kyushu University), N. Nakashima (WPI-I2CNER, Kyushu University), and T. Fujigaya (Department of Applied Chemistry, Kyushu University, WPI-I2CNER, Kyushu University)
- 733 **Fluorescent Ultrashort Nanotubes from Defect-Induced Chemical Cutting** – Y. Li, X. Wu, M. Kim (University of Maryland), H. Qu (University Of Maryland), J. Fortner, and Y. Wang (University of Maryland)
- 734 **Carbon Nanotube Composite Based Sensor for Detecting Hydrogen Molecules** – J. Lee (Korea Institute of Industrial Technology (KITECH), Kyungpook National University), J. K. Kim (Korea Institute of Industrial Technology (KITECH), Kyungpook National University), S. Kim, and D. Jung (Korea Institute of Industrial Technology (KITECH))
- 735 **Improved Performance of Carbon Nanotube Based Strain Sensor** – J. K. Kim, J. Lee (Kyungpook National University), and D. Jung (Korea Institute of Industrial Technology (KITECH))

B04 Nano in Latin America

Nanocarbons / Dielectric Science and Technology / Electronics and Photonics

B04 Poster Session – 18:00 – 20:00

- 750 **Electrochemical Study of Tartrazine Using a Carbon Paste Electrode Modified with Nanostructured Materials** – S. I. Rivera-Hernández, N. Roque-de la O, G. Vázquez-Huerta (Universidad Autónoma Metropolitana-Azcapotzalco), S. Corona-Avendaño (Universidad Autónoma Metropolitana-Azcapotzalco), M. Palomar-Pardavé (Universidad Autónoma Metropolitana-Azcapotzalco), and M. A. Romero-Romo (Universidad Autónoma Metropolitana-Azcapotzalco)
- 751 **Methanol Electro-Oxidation on Pt/C and Au @Pt/C Nanoparticles with Different Shapes.** – N. Roque-de la O, S. I. Rivera-Hernández (Universidad Autónoma Metropolitana-Azcapotzalco), S. Corona-Avendaño (Universidad Autónoma Metropolitana-Azcapotzalco), G. Vázquez-Huerta, and E. Refugio-García (Universidad Autónoma Metropolitana-Azcapotzalco)
- 752 **The Effect of Swelling on Charge's Transmission of Chitosan and Reduced Graphene Oxide Films Electrodes** – M. A. Nakagawa (Instituto Tecnológico da Aeronáutica), C. Brito de Souza (Instituto Tecnológico da Aeronáutica), and E. S. Gonçalves (Instituto Tecnológico da Aeronáutica, Instituto de Aeronáutica e Espaço)

- 753 **Electrodeposition of Co and Pd Onto Carbon Fiber and Platinum Ultramicroelectrodes** – J. A. Corona Castro and L. H. Mendoza Huizar (Universidad Autónoma del Estado de Hidalgo)
- 754 **Nanohydroxyapatite/Graphene Nanoribbons Nanocomposites for Bone Tissue Engineering Applications** – F. C. Oliveira (Universidade Brasil, UNINOVAFAPI), J. O. Carvalho (UNINOVAFAPI), B. C. Viana (Federal University of Piauí), F. R. Marciano (Universidade Brasil), and A. O. Lobo (Federal University of Piauí, Universidade Brasil)

B05

Fullerenes - Endohedral Fullerenes and Molecular Carbon

Nanocarbons
City View 7, Dallas Sheraton Hotel

Endohedral Fullerenes - New Structures – 08:00 – 09:40

Chair(s): Harry C Dorn and Josep M. Poble

- 08:00 788 **(Invited) Uranium-Based Endohedral Fullerenes: Completely Unexpected and Unusual Cage Structures Dictated By the Tetracationic Lanthanide Metal Ion** – L. Echegoyen, W. Cai (The University of Texas at El Paso), J. M. Poble (univ. rovira i virgili), L. Feng (Soochow University), R. Morales-Martinez, A. Rodriguez-Fortea (Universitat Rovira i Virgili), and N. Chen (Soochow University)
- 08:20 789 **(Invited) Actinide Endohedral Fullerenes: Unexpected Cages and Encapsulated Clusters** – N. Chen, J. Zhuang (Soochow University), Y. Wang (Soochow University, Suzhou, Jiangsu, (China)), W. Yang, and X. Li (Soochow University)
- 08:40 790 **(Invited) Temperature Works Against Symmetry but “Fortunately” It Does Not Always Win: The Example of Formation of Actinide Endohedral Metallofullerenes** – J. M. Poble, R. Morales-Martinez, L. Abella, A. Rodriguez-Fortea (Universitat Rovira i Virgili), J. Zhuang, N. Chen (Soochow University), W. Cai, and L. Echegoyen (The University of Texas at El Paso)
- 09:00 791 **(Invited) New Approaches in Computational Modeling of Fullerene/Metallofullerenes** – X. Liu and H. C. Dorn (Virginia Tech Chemistry)
- 09:20 792 **(Invited) Electronic Structure and Properties of Boron-Doped Endohedral Metalloheterofullerenes** – A. Rodriguez-Fortea, A. Moreno-Vicente, S. Schardt (Universitat Rovira i Virgili), P. W. Dunk (National High Magnetic Field Laboratory/FSU), and J. M. Poble (univ. rovira i virgili)

Applications of Fullerenes – 10:00 – 11:20

Chair(s): Alexey A. Popov and Hiroshi Imahori

- 10:00 793 **(Invited) Isomer Effects of Nanocarbons in Organic Solar Cells** – H. Imahori (Kyoto University)
- 10:20 794 **(Invited) Lithium-Ion Endohedral Fullerenes on Carbon Nanotube Electrode-Laminated Perovskite Solar Cells As Dopants and Anti-Oxidants** – I. Jeon, A. Shawky (The University of Tokyo), E. Kauppinen (Aalto University School of Science), S. Maruyama (The University of Tokyo), and Y. Matsuo (University of Science and Technology of China)
- 10:40 795 **(Invited) Synthesis and Properties of Giant Molecular Carbon Nanorings and Nanocrowns Based on Nanographenes** – P. Du, Q. Huang, and H. Jia (University of Science and Technology of China (USTC))
- 11:00 796 **(Invited) Hybridizing Fullerenes and Two-Dimensional Nanomaterials** – S. Yang (University of Science and Technology of China)

Lone Star B/C, Dallas Sheraton Convention Center

B05 Poster Session – 18:00 – 20:00

Chair(s): Shangfeng Yang

- 797 **High Regioselective Cycloaddition of Sc₃N@C₇₈ with Aryl Oxiranes** – M. Chen (Muqing Chen), R. Guan, F. Jin, and S. Yang (University of Science and Technology of China)
- 798 **Purification of Nanotubular Fullerenes: Manipulating Reactivity Differences of Carbon Tubes and Spheres** – T. L. Seeler, R. M. Koenig, K. R. Tepper, H. M. Franklin, and S. Stevenson (Purdue University - Fort Wayne)
- 799 **Chemical Purification of Lutetium Clusters Entrapped in Less-Common Fullerene Cages** – H. M. Franklin, S. Stevenson, and K. R. Tepper (Purdue University - Fort Wayne)
- 800 **Leveraging Reactivity Differences to Isolate the Less-Common Holmium Metallofullerenes** – K. R. Tepper and S. Stevenson (Purdue University - Fort Wayne)
- 801 **C₆₀-Fused Ketoamides Formation in Self-Sensitized Photo-Oxidation of 2-Fulleropyrrolines and Its Dynamic Study** – J. Bo, P. Rufang, and Z. Tian (Southwest University of Science and Technology)

2D Layered Materials from Fundamental Science to Applications -

Session 4 – 08:00 – 12:20

Chair(s): Richard Martel

- 08:00 831 **Transition Metal Salts Additive as Antioxidant or Metal Oxide Decorator during Electrochemical Exfoliation of Graphite?** – A. Ejigu (School of Chemistry, The University of Manchester), K. Fujisawa (Pennsylvania State University), B. F. Spencer (University of Manchester, School of Materials), B. Wang (University of Manchester, School of Chemistry), M. Terrones (Pennsylvania State University), I. A. Kinloch (School of Materials, University of Manchester), and R. A. Dryfe (School of Chemistry, University of Manchester)
- 08:20 832 **Engineered [60]Fullerene-Graphene Macroassemblies: Synthesis, Characterization and Applications** – M. R. Cerón, C. Zhan, T. A. Pham, P. G. Campbell, J. Biener (Lawrence Livermore National Laboratory), L. Echegoyen (The University of Texas at El Paso), and M. M. Biener (Lawrence Livermore National Laboratory)
- 08:40 833 **Modification of Conductive Electrodes with Two-Dimensional Materials** – M. Velický (Cornell University), R. A. Dryfe (School of Chemistry, University of Manchester), K. S. Novoselov (School of Physics and Astronomy, University of Manchester), and H. D. Abruña (Cornell University)
- 09:00 834 **(Invited) Large Area Ion Sensitive Graphene Field Effect Transistors for Potassium, Sodium and Chlorine Sensing** – I. Fakh, F. Mahvash (McGill University), B. Ghaddab (Université du Québec à Montréal), A. Centeno, A. Zurutuza (Graphenea), M. Siaz (Université du Québec à Montréal), and T. Szkopek (McGill University)
- 09:20 835 **(Invited) Covalent Functionalization of Graphene and MoS₂: Chemical Versus Electrochemical Routes** – K. S. Mali (KU Leuven-University of Leuven) and S. De Feyter (KU Leuven)
- 09:40 **Break**
- 10:00 836 **(Invited) The Role of Defects in Van Der Waals Epitaxy of Transition Metal Dichalcogenides** – X. Zhang, T. Choudhury, M. Chubarov, A. Bansal, and J. M. Redwing (The Pennsylvania State University)
- 10:20 837 **Molybdenum Disulfides and Diselenides By Atomic Layer Deposition** – R. Zazpe (Brno University of Technology), J. Prikryl, M. Krbal (University of Pardubice), S. Ng (Brno University of Technology), F. Dvorak, F. Bures (University of Pardubice), and J. M. Macak (Brno University of Technology)

- 10:40 838 **Investigation on the Stability of MoS_{2(1-x)}Te_{2x} Fabricated By Tellurization Using Organic Precursor (i-C₃H₇)₂te** – Y. Hibino, S. Ishihara (Meiji University, JSPS Research Fellow), K. Yamazaki, Y. Oyanagi, Y. Hashimoto, N. Sawamoto (Meiji University), H. Machida, M. Ishikawa, H. Sudoh (Gas-phase Growth Ltd.), H. Wakabayashi (Tokyo Institute of Technology), and A. Ogura (Meiji University)
- 11:00 839 **(Invited) Tuning Optoelectronic Properties of Transition Metal Dichalcogenides for Hydrogen Generation** – E. M. Miller (National Renewable Energy Laboratory)
- 11:20 840 **(Invited) Atomic-Scale Exploration of Synthetic Low Dimensional Materials** – N. P. Guisinger (Argonne National Laboratory)
- 11:40 841 **(Invited) Controlling and Tailoring the Electronic Properties of Chemically Reactive 2D Materials** – M. C. Hersam (Northwestern University)
- 12:00 842 **(Invited) 2D-Metals: From Synthesis to Quantum Phenomena** – J. A. Robinson (Pennsylvania State University)

2D Layered Materials from Fundamental Science to Applications -

Session 5 – 14:00 – 15:40

Chair(s): Nathan P Guisinger

- 14:00 843 **(Invited) Towards High-Performance Field-Effect Transistors with Atomically Precise Graphene Nanoribbons** – J. P. Llinas (University of California, Berkeley)
- 14:20 844 **(Invited) Atomically Precise Graphene Nanoribbons: From Synthesis to Applications** – A. Sinitskii (University of Nebraska - Lincoln)
- 14:40 845 **(Invited) Electronic Structure and Raman Fingerprint of Atomically Precise Graphene Nanoribbons – a Key for Integration in Devices.** – B. V. Senkovskiy, K. Lindfors (University of Cologne), F. R. Fisher (University of California, Berkeley), and A. Grueneis (University of Cologne)
- 15:00 846 **Tightly Pitched Sub-10 Nm Nanoribbons Grown Via Seeded Anisotropic Synthesis on Ge(001)** – A. J. Way, E. Murray, R. M. Jacobberger, F. Goeltl, V. Saraswat, M. Mavrikakis, and M. S. Arnold (University of Wisconsin - Madison)
- 15:20 847 **Direct Synthesis of Armchair Graphene Nanoribbons on Ge(001)/Si(001) Using CVD** – V. Saraswat (University of Wisconsin - Madison), Y. Yamamoto (IHP), R. M. Jacobberger, A. J. Way, and M. S. Arnold (University of Wisconsin - Madison)

Lone Star B/C, Dallas Sheraton Convention Center

B06 Poster Session – 18:00 – 20:00

Chair(s): Michael S. Arnold

- 848 **Synthesis and Application of Molybdenum Disulphide Thin Layers Grown By Chemical Vapour Deposition** – R. Mula (IIT Kharapur), K. Biswas, K. Annapurna (CGCRI), and C. Jacob (IIT Kharapur)

- 849 **Synthesis of Large-Scale Single-Layer $\text{Mo}_{1-x}\text{W}_x\text{S}_2$ Alloys with Highly Uniform and Tunable Photoluminescence** – J. Park and W. Choi (University of North Texas)
- 850 **Epitaxial and Atomically Thin Graphene–Metal Hybrid Catalyst Films—the Dual Role of Graphene As the Support and the Chemically-Transparent Protective Cap** – A. Abdelhafiz and F. M. Alamgir (Georgia Institute of Technology)
- 851 **Removal of Photoresist Residues and Healing of Defects on Graphene Using H_2 and CH_4 Plasma** – C. Y. Park (Department of Physics, Sungkyunkwan University), Y. Son (Department of Chemistry, Sungkyunkwan University), and H. K. Jo (Sungkyunkwan University)
- 852 **Alkali Metal Doped Mono- and Bilayer Graphene: Band Structure, Raman Spectrum and Electronic Transport** – M. Hell, N. Ehlen, Y. Falke, B. V. Senkovskiy (University of Cologne), L. Petaccia (Elettra Sincrotrone Trieste), T. Szkopek (McGill University), and A. Grueneis (University of Cologne)

B07

Light Energy Conversion with Metal Halide Perovskites, Semiconductor Nanostructures, and Inorganic/Organic Hybrid Materials

Nanocarbons / Physical and Analytical Electrochemistry
City View 8, Dallas Sheraton Hotel

Semiconductors 1 – 08:00 – 09:40

Chair(s): Jea-Gun Park and Kentaro Teramura

- 08:00 881 **Graphitic Carbon Nitride ($\text{g-C}_3\text{N}_4$) Modified N-Doped LaTiO_3 As an Organic–Inorganic Hybrid for Higher Visible Light Photocatalytic and Photo-Electrochemical Performance** – M. Rakibuddin, M. A. Shinde, and H. Kim (Yeungnam University)
- 08:20 882 **High Resolution OLED Using Eco-Friendly Quantum-Dots Functional Color-Filter** – J. E. Lee (Hanyang University), S. J. Lee (Hanyang university), S. Y. Kim, J. H. Park, U. H. Jung, T. H. Sim, and J. G. Park (Hanyang University)
- 08:40 883 **(Invited) Modification By an Ag–Cr Core–Shell Cocatalyst for Highly Selective Photocatalytic Conversion of CO_2 by H_2O** – K. Teramura (Department of Molecular Engineering, Kyoto University)
- 09:00 884 **(Invited) Beta, Beta-Functionalized Push-Pull *Opp*-Dibenzoporphyrins As Sensitizers for Dye-Sensitized Solar Cells: The Role of the Phenylethynyl Bridge** – H. Wang (University of North Texas), Y. Hu, and F. D'Souza (University of North Texas)
- 09:20 885 **(Invited) Electrochemical Oxygen Reduction Catalyzed at Pt–Ni Nanostructured Electrocatalysts Immobilized on Nitrogen-Doped Carbon Supports** – M. Kato, K. Ogura, S. Nakagawa, T. Li, R. Nakahoshiha, S. Tokuda, and I. Yagi (Hokkaido University)

Semiconductors 2 – 10:00 – 12:20

Chair(s): Tsukasa Torimoto, Frank E. Osterloh and Akihito Imanishi

- 10:00 886 **(Invited) Effect of Particle Size on Photocatalytic Reaction Kinetics Including Multielectron-Transfer Processes** – B. Ohtani (Institute for Catalysis, Hokkaido University) and M. Takashima (Graduate School of Environmental Science, Hokkaido Univ.)
 - 10:20 887 **(Invited) Using Surface Photovoltage Spectroscopy to Observe Photovoltage Generation at the Interfaces of Cu_2O , BiVO_4 , and Rh: SrTiO_3 Particles** – F. E. Osterloh, Z. Wu (University of California-Davis), and M. A. Melo (University of California - Davis)
 - 10:40 888 **Narrow Band-Edge Photoluminescence of Ga^{3+} -Doped AgInS_2 Quantum Dots** – T. Torimoto, T. Kameyama, M. Kishi, C. Miyamae (Nagoya University), T. Uematsu, and S. Kuwabata (Osaka University)
 - 11:00 889 **(Invited) Geometry and Dynamics of Quintet Multiexciton Studied By Time-Resolved EPR** – Y. Kobori (Kobe University), H. Nagashima (Kobe University), S. Kawaoka (Osaka Prefecture University), S. Akimoto (Kobe University), T. Tachikawa (Kobe University), Y. Matsui, and H. Ikeda (Osaka Prefecture University)
 - 11:20 890 **(Invited) Photoionization in Doped and Undoped Semiconductor Quantum Dots** – I. Robel (Los Alamos National Laboratory)
 - 11:40 891 **(Invited) Construction of Organic and Inorganic Hybrid Nanomaterials Utilizing Acene Derivatives for Efficient Singlet Fission** – T. Hasobe and H. Sakai (Faculty of Science and Technology, Keio University)
 - 12:00 892 **Nanowire-Based Energy Conversion Devices and Technologies for Waste Heat Scavenging and Water Disinfection** – S. Vaddiraju (Department of Chemical Engineering, Texas A&M University)
- Semiconductors 3 – 14:00 – 15:40**
Chair(s): Andrew A. Gewirth, Akihito Imanishi and Vito Di Noto
- 14:00 893 **(Invited) Control of Diffusion Behavior of Metal Ions at Ionic Liquid/Electrode Interface and Its Effect on Electrodeposits** – A. Imanishi (Graduate School of Engineering Science, Osaka University)
 - 14:20 894 **(Invited) Catalytic Reaction Networks Mimicking Photosynthetic Electron Transport Chain** – S. Nakanishi (Osaka University)
 - 14:40 895 **(Invited) Ordered Nanoporous Semiconductors with Controlled Geometrical Structures By Anodization Processes** – T. Yanagishita, T. Kondo, and H. Masuda (Tokyo Metropolitan University)
 - 15:00 896 **(Invited) Synthesis of Multimetallic Subnano Particles Using a Dendrimer Reactor** – K. Yamamoto (Tokyo Institute of Technology)

- 15:20 897 **(Invited) Nanostructured Copper and Copper Alloys for CO₂ Reduction** – A. A. Gewirth (University of Illinois), T. T. H. Hoang (University of Illinois at Urbana-Champaign), X. S. Chen (University of Illinois Urbana-Champaign), and P. J. A. Kenis (University of Illinois at Urbana-Champaign)

Lone Star B/C, Dallas Sheraton Convention Center

B08 Porphyrins, Phthalocyanines, and Supramolecular Assemblies

Nanocarbons / Organic and Biological Electrochemistry
City View 7, Dallas Sheraton Hotel

Sensors – 11:20 – 12:20

Chair(s): Nathalie Solladie and Karl M. Kadish

- 11:20 898 **Chiral Discrimination By Porphyrin Supramolecular Aggregates Based Chemical Sensors** – R. Paolesse, M. Stefanelli, D. Monti, G. Magna, and C. Di Natale (University of Rome Tor Vergata)
- 11:40 899 **Synergistic Effects between Phthalocyanines and Nanoparticles in Nanostructured Voltammetric Sensors - Applications in the Food Industry** – C. Garcia-Hernandez, C. Salvo-Comino, C. Garcia-Cabezon, F. Martin-Pedrosa, and M. L. Rodriguez-Mendez (Group UvaSens, Universidad de Valladolid, Spain.)
- 12:00 900 **Bis-Porphyrin Structural Motif for Chirality and Molecular Sensing** – R. Du, Z. Zhou, and V. Borovkov (South-Central University for Nationalities)

Porphyrinoid Electrochemistry – 14:00 – 15:40

Chair(s): Karl M. Kadish and Nathalie Solladie

- 14:00 901 **Electrochemical and Chemical Reactivity of Octahalogenated *Meso*-Tetrakis(3,5-di-*tert*-butyl-4-hydroxyphenyl)Porphyrins** – L. Cong (University of Houston), M. K. Chahal (Indian Institute of Technology Roorkee), R. Osterloh (University of Houston), M. Sankar (Indian Institute of Technology Roorkee, Roorkee), and K. M. Kadish (University of Houston)
- 14:20 902 **Formation and Isolation of a Four-Electron-Reduced Porphyrin** – T. Kojima, W. Suzuki, H. Kotani, T. Ishizuka (University of Tsukuba), Y. Shiota, and K. Yoshizawa (Kyushu University)
- 14:40 903 **Electrochemistry of Three-Dimensional Porphyrin Arrays and Related Compounds** – S. Hiroto (Kyoto University)
- 15:00 904 **Synthesis, Structural, Spectral and Electrochemical Redox Properties of N-Fused Porphyrins and Their Photoinduced Electron Transfer Studies with C₆₀ Derivatives** – M. Sankar, P. Rathi (Indian Institute of Technology Roorkee), S. Seetharaman, and F. D'Souza (University of North Texas)
- 15:20 905 **Electrochemical and Chemical Reductions to Stable [Co(NO)]⁹ N-Confused Porphyrin Complexes for NO to Nitrous Oxide Conversion** – C. H. Hung (Institute of Chemistry, Academia Sinica)

B08 Poster Session – 18:00 – 20:00

Chair(s): Nathalie Solladie and Muniappan Sankar

- 906 **Synthesis, Structural, Spectral and Electrochemical Redox Properties of Monofused Porphyrins Derived from *Trans*-Chlorins** – N. Chaudhri, N. Grover, and M. Sankar (Indian Institute of Technology Roorkee)
- 907 **Extension of π Conjugation System By Functionalization of the Beta Position of Porphyrin** – R. Perera (University of North Texas) and H. Wang (University of North Texas)
- 908 **Synthesis, Spectral and Electrochemical Redox Properties of EAA-Appended Porphyrins** – I. Yadav and M. Sankar (Indian Institute of Technology Roorkee)
- 909 **Synthesis and Applications of Monobenzoporphyrins** – S. Kumar and M. Sankar (Indian Institute of Technology Roorkee)
- 910 **Synthesis, Photophysical and Electrochemical Redox Properties of *B*-Octa and Hepta Substituted Chlorins and Porphyrins** – R. K. Rohal and M. Sankar (Indian Institute of Technology Roorkee)
- 911 **Synthesis of Dithiophene-Monobenzo-Tetra(4-isopropylphenyl)Porphyrin** – C. Stewart (University of North Texas)
- 912 **Ultrafast Photoinduced Charge Separation in Wide-Band Capturing, Bis-Styryl Bodipy-Fullerene Donor – Acceptor Assemblies** – S. Shao, C. Obondi, H. Gobeze, G. N. Lim (University of North Texas), P. Karr (Wayne State College), and F. D'Souza (University of North Texas)
- 913 **Pentacene Fused Porphyrin Dimer Exhibiting High Stability and Solubility** – Y. Hu (University of North Texas) and H. Wang (University of North Texas)
- 914 **Rigid and Flexible Bis-Porphyrinic Tweezers: Efficient Molecular Recognition of Bidentate Bases.** – R. Rein and N. Solladie (Laboratoire de Chimie de Coordination - CNRS)
- 915 **Synthesis and Computational Study of Pentacenequinone-Fused Porphyrins with Triply-Split Soret Bands** – A. Moss, S. Washburn (University of North Texas), and H. Wang (University of North Texas)

B09

Nano for Industry

Nanocarbons / Industrial Electrochemistry and Electrochemical Engineering / Physical and Analytical Electrochemistry / Interdisciplinary Science and Technology Subcommittee / Dielectric Science and Technology

B09 Poster Session – 18:00 – 20:00

- 955 **High-Performance Flexible Supercapacitors Based on Hair Fiber-Shaped Electrode** – W. Liu, M. Zhang, and A. Yu (University of Waterloo)
- 956 **Superior Micro-Supercapacitors Based on Graphenequantum Dots** – M. Zhang, W. Liu, and A. Yu (University of Waterloo)

Stainless Steel – 08:30 – 12:00

Chair(s): Hiroaki Tsuchiya and Zhanpeng Lu

- 08:30 993 **Electrochemical Behavior of Stainless Steels in Highly Concentrated Electrolytes** – H. Tsuchiya, S. Tokuoka, and S. Fujimoto (Osaka University)
- 08:50 994 **Effect of PBF-SLM Process Parameters on the Electrochemical Behavior of 316L Stainless Steel Parts in Acidic and Chloride Containing Environments** – P. Murkute, S. Pasebani, and O. B. Isgor (Oregon State University)
- 09:10 995 **Electrochemical Changes with Thermal Aging of Duplex Stainless Steels** – P. Murkute, K. O. Sarfo (Oregon State University), Y. Zhang (Idaho National Laboratory), L. Árnadóttir, J. Tucker, and O. B. Isgor (Oregon State University)
- 09:30 **Break**
- 10:00 996 **XPS Analysis of the Oxide Films Formed on Non-Charged and Hydrogen-Charged 316L SS in Deaerated High Temperature Water** – T. Cui (Shanghai University, School of Mater. Sci. & Eng.), J. Ma (Shanghai University), K. Zhang (Shanghai University, School of Mater. Sci. & Eng.), Y. Jia, F. Ning (Shanghai University, School of Mater. Sci. & Eng.), and Z. Lu (School of Mater. Sci. and Eng., Shanghai University)
- 10:20 997 **Structure of the Oxide Films Formed on Hydrogen-Charged and Uncharged 316L Stainless Steels in Oxygenated High Temperature Water** – T. Cui (Shanghai University, School of Mater. Sci. & Eng.), K. Zhang (Shanghai University, School of Mater. Sci. & Eng.), J. Ma (Shanghai University), Y. Jia, F. Ning (Shanghai University, School of Mater. Sci. & Eng.), and Z. Lu (School of Mater. Sci. and Eng., Shanghai University)
- 10:40 998 **Synthesis and Evaluation of Anionic Schiff Bases As Pitting Corrosion Inhibitor for Stainless Steel 304 in NaCl Solution** – M. Talebian, K. Raieisi, M. Atapour (Isfahan University of Technology), B. M. Fernández-Pérez, A. M. Betancor-Abreu (Universidad de La Laguna), I. Llorente (Centro Nacional de Investigaciones Metalúrgicas, CSIC), S. Fajardo (Centro Nacional de Investigaciones Metalúrgicas (CENIM)), M. Amirnasr, Z. Salarvand (Isfahan University of Technology), and R. M. Souto (Universidad de La Laguna)
- 11:00 999 **3D Peridynamic Models for Pitting Corrosion and Stress Corrosion Cracking** – S. Jafarzadeh (University of Nebraska-Lincoln), Z. Chen (Huazhong University of Science and Technology), J. Zhao, and F. Bobaru (University of Nebraska-Lincoln)

- 11:20 1000 **Corrosion Behaviors of Ferritic and Martensitic Stainless Steels in H₂O Containing CO₂ and O₂ at Elevated Pressures** – R. Repukaiti, L. Teeter, Ö. N. Doğan (National Energy Technology Laboratory), M. Ziomek-Moroz (DOE/NETL), R. P. Oleksak, R. B. Thomas, N. Huerta, J. P. Baltrus (National Energy Technology Laboratory), and J. Tucker (Oregon State University)

- 11:40 1001 **Mechanistic Insights into the Initial Stages of Chloride Enhanced Depassivation of Chromium Oxide Film, a Density Functional Theory Study** – K. O. Sarfo, P. Murkute, O. B. Isgor, J. Tucker, L. Árnadóttir (Oregon State University), and Y. Zhang (Idaho National Laboratory)

Corrosion Protection – 14:00 – 17:20

Chair(s): Dev Chidambaram and Eiji Tada

- 14:00 1002 **The Effects of Citric Acid on the Mechanical and Corrosion Resistant Properties of Ni-Y₂O₃ Coatings for Enhanced Corrosion Protection** – N. Ngo (Department of Chemistry, University of North Texas), G. Argade (Department of Material Science, University of North Texas), and T. Golden (Department of Chemistry, University of North Texas)
- 14:20 1003 **Mechanistic Study of Environmentally-Friendly Zr-Based and Hybrid Nano-Coating Surface Conversion Treatment** – X. Liu (Stony Brook University), D. Vonk (Henkel Corporation), X. Tong (Brookhaven National Laboratory), B. Ravel (NIST), G. P. Halada (Stony Brook University), K. Foster, S. Petrush (Henkel Corporation), and Y. C. K. Chen-Wiegart (Stony Brook University, Brookhaven National Laboratory)
- 14:40 1004 **Study on Corrosion and Cavitation Behaviors of NiTi Alloy Coated on Steel** – Q. Zeng Sr. (Xi'an Jiaotong University) and Y. Gu (Beijing Institute of Petrochemical Technology)
- 15:00 1005 **Henna Extract As a Corrosion Inhibitor on Carbon Steel with TMSM-PMMA Hybrid Coating** – A. Rabiei Baboukani and M. Torkghashghaei (Florida International University)
- 15:20 **Break**
- 15:40 1006 **Acridin-Based Thiosemicarbazones As Novel Corrosion Inhibitors in the Corrosion of Mild Steel in 1M HCl: Synthesis, Gravimetric, Electrochemical, and Quantum Chemical Studies** – E. D. Akpan (North West University), I. O. Isaac (Akwa Ibom State University), L. O. Olasunkanmi (North-West University, South Africa), and E. E. Ebenso (North-West University (Mafikeng Campus))
- 16:00 1007 **Electrochemical, Surface Morphology and Computational Studies on Some Quinoxalin-6-Yl-4,5-Dihydropyrazolylpropanones As Inhibitors of Mild Steel Corrosion in 1 M HCl Solution** – L. O. Olasunkanmi (North-West University, South Africa, Obafemi Awolowo University, Ile-Ife, Nigeria) and E. E. Ebenso (North-West University (Mafikeng Campus))

- 16:20 1008 **Super Slipery Coating By ZnO Based on Aluminum and Its Anti-Corrosion Performance** – J. Liu (Harbin Engineering University)
- 16:40 1009 **Newly-Developed Molybdate-Based Protective Coatings for AZ31D Magnesium Alloys** – M. Farhat (Central Metallurgical R&D Institute)
- 17:00 1010 **Prospects and Challenges of Supramolecular Approaches in Corrosion Prevention Strategies** – V. S. Saji (King Fahd University of Petroleum and Minerals (KFUPM))

Lone Star B/C, Dallas Sheraton Convention Center

C01 Poster Session – 18:00 – 20:00

Chair(s): Masayuki Itagaki and Jamie Noel

- 1011 **Effect of Hydrogen Embrittlement on the Mechanical and Electrochemical Properties of Carbon Steel API 5L X65 in a CO₂-Saturated 3.5 Wt.% NaCl Solution** – A. Rodriguez (ORISE/DOE/NETL), K. Rozman (AECOM/DOE/NETL), M. Ziomek-Moroz, and J. H. Tylczak (DOE/NETL)
- 1012 **Corrosion Protection Application of Liquid-Infused Surface with Regional Growth of LDH Films on Al Alloys** – J. Shuyue, Z. Haifeng, T. Yanjing, R. Wanting, and X. Liu (Harbin Institute of Technology)
- 1013 **The Effectiveness of Some Organic Polymers As Corrosion Inhibitors for Carbon Steel and Brass in Acidic Media** – F. Branzoi, L. Aricov, and A. Baran (Institute of Physical Chemistry)
- 1014 **Photocathodic Protection Performance of ZnS-CdS-Ag@TiO₂ for 403SS Under Visible Light** – Y. Zhu (Binzhou University)
- 1015 **Development of a New Copper Corrosion Screening Methodology for Application in Microelectronics** – J. Alptekin, A. S. Salunke, M. Asokan, G. Issac, J. Caperton, and O. Chyan (University of North Texas)
- 1016 **Aromatic Disulfide Based Compounds As Corrosion Inhibitors for Steel in Acidic Media** – D. Karunarathne and T. D. Golden (University of North Texas)
- 1017 **Corrosion Studies of 12-Aminododecanoate Modified Zn-Al LDH/Epoxy Coating** – A. Aminifazl and T. D. Golden (University of North Texas)
- 1018 **Enhancing Mechanical and Corrosion Properties of Electrodeposited Ni-Pr₆O₁₁ Composite Coatings Via Stabilizing Agents** – J. England, N. Ngo, and T. Golden (Department of Chemistry, University of North Texas)
- 1019 **Effect of Soil Particle Size on Corrosion Behavior of Buried Carbon Steel** – S. Ohki, S. Mineta, M. Mizunuma, and M. Tsuda (NTT Device Technology Labs, NTT Corporation)



Chemical Mechanical Polishing 15

Dielectric Science and Technology

Pearl 2, Dallas Sheraton Hotel

Chemical Mechanical Polishing 15 - Session 1 – 09:00 – 12:15

Chair(s): Yaw S. Obeng and Robert L. Rhoades

- 09:00 **Welcoming Remarks - Gautam Banerjee, Versum Materials**
- 09:20 1031 **(Invited) A Review on the Role of Slurry Chemistry on Chemically Modified Thin Film Formation for CMP Applications** – G. B. Basim (178 Rhines Hall)
- 10:00 1032 **Mechanistic Understanding of the Planarization Behavior of Low κ Organosilicate Glass Films with Beol Barrier Slurries** – A. Mallikarjunan (Versum Materials Technology LLC., Taiwan), J. Achtyl (Versum Materials, Tempe AZ, USA), R. J. Yang, C. Y. Huang, S. H. Chao (Versum Materials Technology LLC., Taiwan), L. Gan, R. Ridgeway, J. Schlueter (Versum Materials, Tempe AZ, USA), M. S. Tsai, C. Li (Versum Materials Technology LLC., Taiwan), and M. O'Neill (Versum Materials, Tempe AZ, USA)
- 10:30 **Break**
- 10:45 1033 **Small Molecule Adsorption on Colloidal Alumina and Zirconia Abrasives Used in Chemical-Mechanical Planarization (CMP) Slurries** – K. A. Martinez, M. R. Stewart, D. J. Campbell, and E. E. Remsen (Dept. of Chemistry and Biochemistry, Bradley University)
- 11:15 1034 **Holographic Characterization of Contaminants in CMP Slurries** – F. C. Cheong, J. Lumer, M. A. Odete, A. Winters, and L. A. Philips (Spheryx, Inc.)
- 11:45 1035 **Initial Study on the Polishing Performance of Silica Abrasive Size in Copper Barrier Chemical Mechanical Planarization (CMP)** – G. Lee and H. Park (SK hynix)

Chemical Mechanical Polishing 15 - Session 2 – 13:30 – 17:00

Chair(s): Aniruddh J. Khanna and Edward E. Remsen

- 13:30 1036 **(Invited) Unraveling Synergistic Interactions driving the Chemical Mechanical Planarization Process** – J. J. Keleher (Lewis University, Department of Chemistry)
- 14:10 1037 **Effects of Amino Acids on Silicon Oxide for High Silicon Oxide Removal Rate Ceria Slurry** – T. Kim (SAINT, Sungkyunkwan University)
- 14:40 **Break**
- 15:00 1038 **Table-Top Evaluation Approach to Design Post-CMP Clean Chemicals** – T. Kusano and K. Takeshita (Mitsubishi Chemical Corporation)
- 15:30 1039 **Improvement of Post CMP Cleaning Efficiency through Surface Energy Optimization and Use of Viscoelastic Fluids** – S. Ozbek (South Dakota School of Mines and Technology, Ozyegin University), T. Walker (South Dakota School of Mines and Technology, Oregon State University), R. K. Cashen (Oregon State University), and G. B. Basim (178 Rhines Hall)

- 16:00 1040 **In-Situ Electrochemical Characterization on Pcmp Cleaning Under Brushing Conditions** – J. Liu, M. White (Entegris, Inc.), C. Johnson, and D. Roy (Clarkson University)
- 16:30 1041 **Comparison of Wear with Friction Data in Chemical Mechanical Planarization** – C. McGowan and J. Levert (University of New Haven)

Lone Star B/C, Dallas Sheraton Convention Center

D01 Poster Session – 18:00 – 20:00

Chair(s): Gautam Banerjee

- 1030 **Hydraulic Jump Dynamics for Water Jet Impingement on Vertically Oriented Rotating Surfaces** – P. Adiga (Oregon State University)

F03

Characterization of Porous Materials 8

Industrial Electrochemistry and Electrochemical Engineering / Battery / Energy Technology
Pearl 5, Dallas Sheraton Hotel

Industrial Electrochemistry and Electrochemical Engineering Division

H. H. Dow Memorial Student Achievement Award Address –

09:00 – 09:40

Chair(s): John A. Staser and Christina Bock

- 09:00 1103 *(Industrial Electrochemistry and Electrochemical Engineering Division H. H. Dow Memorial Student Achievement Award)* **Transport Study Inside Porous Layers of PEFC Using Direct Numerical Simulation** – P. Satjaritanun, S. Shimpalee, J. W. Weidner (University of South Carolina), I. V. Zenyuk (University of California Irvine), and S. Hirano (Ford Motor Company)

Characterization of Porous Materials 8 - Session 1 – 10:00 – 12:00

Chair(s): John A. Staser and Christina Bock

- 10:00 1104 **Symmetric and Asymmetric Capacitive Deionization Cells Using Modified Porous Carbon Electrodes** – X. Gao, A. Omosebi (University of Kentucky), J. Landon (Center for Applied Energy Research University of Kentucky), Z. Ma (China University of Mining and Technology), M. Ghorbanian (LG&E and KU Energy LLC), N. Kern (Duke Energy), and K. Liu (University of Kentucky)
- 10:20 1105 **Tracking Gas Diffusion Electrode Flooding in CO₂ Electrolyzers Via Electrochemical Double Layer Capacitance** – M. E. Leonard, A. Fomer-Cuenca, S. M. Brown (Massachusetts Institute of Technology), and F. R. Brushett (Department of Chemical Engineering, MIT)
- 10:40 1106 **Dielectric Characteristics Analysis of Aluminum Electrolytic Capacitors Based on Linear Response Function** – D. Mukaiyama and M. Yamamoto (Department Electrical Engineering, Nagoya University)
- 11:00 1107 **Effect of Tunnel Pits Radius Variation on the Electric Characteristics of Aluminum Electrolytic Capacitor** – D. Mukaiyama and M. Yamamoto (Department Electrical Engineering, Nagoya University)

- 11:20 1108 **Transport Properties of Flow-through Electrodes with Varying Composition and Particle Dimension for Electrochemical Desalination** – E. R. Reale (University of Illinois at Urbana-Champaign) and K. C. Smith (Mechanical Science and Engineering, University of Illinois at Urbana-Champaign)
- 11:40 1109 **Metal Nanowire Felt As a Flow-through Electrode for High-Throughput Electrosynthesis** – B. J. Wiley and M. J. Kim (Duke University)

Characterization of Porous Materials 8 - Session 2 – 14:00 – 17:30

Chair(s): John A. Staser and Christina Bock

- 14:00 1110 **Activated Carbon-Based Electrodes with Engineered Microstructure for Capacitive Deionization (CDI) of Aqueous Solutions** – Y. Salamat, C. Mueller, T. Stanczyk, R. Soheilian, R. Erb, and C. H. Hidrovo (Northeastern University)
- 14:20 1111 **Tailoring Mesoporous Silica Nanoparticles and Thin Films: Synthesis, Characterization and Electrochemical Applications** – E. T. Weldekidan, V. Hornebecq, and C. Lebouin (Aix-Marseille University)
- 14:40 1112 **Hierarchical Bulk Nanoporous Aluminum for on-Board Hydrogen and Heat Generation By Hydrolysis in Pure Water** – J. S. Corsi (School of Engineering, University of Pennsylvania, Vagelos Institute for Energy Science and Technology), J. Fu (School of Engineering, University of Pennsylvania), T. Lee (School of Engineering, University of Pennsylvania, Vagelos Institute for Energy Science and Technology), and E. Detsi (School of Engineering, University of Pennsylvania)
- 15:00 1113 **Conformal Coating on Inverse Opaline Scaffolds for Enhanced Mechanical Properties and Thermal Stability** – P. S. Hung, S. C. Chou, G. R. Wang, C. J. Wang, W. A. Chung, and P. W. Wu (National Chiao Tung University)
- 15:20 1114 **Luminescence and Magnetic Properties of Porous Silicon Investigated with Respect to Its Metal Filling** – P. Granitzer, K. Rumpf (Karl Franzens University Graz), P. Poelt (University of Technology Graz), and M. Reissner (Vienna University of Technology)
- 15:40 **Break**
- 15:50 1115 **Assessment of Arrays of Permanent Nanomagnets Produced By Bi-Metal Deposits within Porous Silicon** – K. Rumpf, P. Granitzer (Karl Franzens University Graz), R. Gonzalez-Rodriguez (Texas Christian University Fort Worth), J. L. Coffey (Texas Christian University), P. Poelt (University of Technology Graz), and H. Michor (Vienna University of Technology)
- 16:10 1116 **Microstructure Simulation and Virtual Material Design of Electrospun Gas Diffusion Layers for Polymer Electrolyte Membrane Fuel Cells** – M. Balakrishnan, K. F. Fahy (University of Toronto), V. P. Schulz (Baden-Wuerttemberg Cooperative State University, University of Toronto), and A. Bazylak (University of Toronto)

- 16:30 **1117** **Novel Electrospun Gas Diffusion Layers with Spatially Graded Pore Sizes for Polymer Electrolyte Membrane Fuel Cells** – M. Balakrishnan (University of Toronto), L. Eifert, R. Zeis (KIT, Helmholtz Institute Ulm), B. D. Hatton, and A. Bazylak (University of Toronto)
- 16:50 **1118** **Perforated Anode Gas Diffusion Layer for Direct Methanol Fuel Cells** – A. Alrashidi (University of Miami)
- 17:10 **1119** **Correlative Multiscale Tomography on Inert Supported Solid Oxide Fuel Cells** – F. Wankmüller, N. Russner, A. Weber (IAM-WET, Karlsruhe Institute of Technology (KIT)), M. Meffert, J. Schmieg (LEM, Karlsruhe Institute of Technology (KIT)), H. Störmer (LEM, Karlsruhe Institute of Technology, Germany), P. Lupetin (Robert Bosch GmbH), D. Gerthsen (LEM, Karlsruhe Institute of Technology (KIT)), and E. Ivers-Tiffée (IAM-WET, Karlsruhe Institute of Technology (KIT))

Lone Star B/C, Dallas Sheraton Convention Center

F03 Poster Session – 18:00 – 20:00

- **1120** **Transport Limitations of Sodium-Ions in Type-II Clathrates** – X. Li (National Renewable Energy Laboratory), K. Steirer, L. Krishna (Colorado School of Mines), C. Xiao, K. Fink, and S. Santhanagopalan (National Renewable Energy Laboratory)
- **1121** **High Ionic Conductivity in 2D Molybdenum Disulfide (MoS₂) Membrane** – J. Park and W. Choi (University of North Texas)

F04

Multiscale Modeling, Simulation and Design 3: Enhancing Understanding, and Extracting Knowledge from Data

Industrial Electrochemistry and Electrochemical Engineering / Energy Technology
 Pearl 4, Dallas Sheraton Hotel

Multiscale Modeling, Simulation and Design 3: Enhancing Understanding, and Extracting Knowledge from Data - Session 1 – 08:00 – 12:00
 Chair(s): John N. Harb and Venkat R. Subramanian

- 08:00 **Introductory Remarks**
- 08:10 **Talk on Perspectives, by Dr. Richard Alkire**
- 08:20 **1122** **(Invited) Model Guided Design and Analysis of Experiment** – N. W. Brady, K. Mayilvahanan, and A. C. West (Columbia University)
- 09:00 **1123** **(Invited) Superconformal Electrodeposition** – T. P. Moffat, G. Liu (NIST), S. Zou (American University), L. Y. Ou Yang, T. Braun, M. Walker, D. Wheeler, L. Richter, and D. Josell (NIST)
- 09:40 **Break**
- 10:00 **1124** **(Invited) Effect of Gravitational Level on the Initial Stage of Cu Electrodeposition** – Y. Fukunaka (Nanotechnology Research Institute, Waseda)
- 10:20 **1125** **Die Level Model for Electroplated Copper Pillars** – G. Graham, L. P. Chua, B. Buckalew, T. Ponnuswamy, and S. Mayer (Lam Research)

- 10:40 **1126** **(Invited) Perspectives on Computational Studies of Electrocatalysis: New Approaches to Theoretical Catalyst Design** – J. Greeley (Purdue University)
- 11:20 **1127** **(Invited) Molecular-Level Analysis of Electrodeposition Processes Using Theoretical Calculations and Surface Enhanced Raman Microscopy** – T. Homma (Department of Applied Chemistry, Waseda University, Res. Org. for Nano&Life Innovation, Waseda University), M. Kunimoto, Y. Onabuta (Department of Applied Chemistry, Waseda University), M. Bertz, and M. Yanagisawa (Res. Org. for Nano & Life Innovation, Waseda University)

Multiscale Modeling, Simulation and Design 3: Enhancing Understanding, and Extracting Knowledge from Data - Session 2 – 14:00 – 18:00
 Chair(s): John N. Harb and Ankur Jain

- 14:00 **1128** **(Invited) Multiscale Stress-Transport-Kinetics Continuum Models for Lithium-Metal Batteries-Relevance of Richard Alkire’s Electrodeposition Legacy for Next-Generation Batteries** – A. Subramanian, T. Jang (University of Washington), E. J. Dufek (Idaho National Laboratory), and V. R. Subramanian (University of Washington)
- 14:20 **1129** **(Invited) Model-Based Battery Management System of Lithium-Ion Batteries** – M. Pathak (BattGenie Inc, Seattle), S. Kolluri (BattGenie Inc, Seattle, University of Washington, Seattle), T. Jang (University of Washington), C. Pathak (University of Washington, BattGenie Inc. Seattle), S. Santhanagopalan (National Renewable Energy Laboratory), and V. R. Subramanian (University of Washington, Pacific Northwest National Laboratory)
- 14:40 **1130** **(Invited) Modeling at Multiple Scales for Development of Future Energy Storage Technologies** – R. M. Stephens (Shell International E&P Inc.), J. Balachandran, I. Rudra, S. Maheshwari, F. Thakkar, S. Bonakala (Shell India Markets Pvt. Ltd.), G. Verbist (Shell Global Solutions International B.V.), and R. Ratnakar (Shell International E&P Inc.)
- 15:20 **1131** **(Invited) Atomically-Informed Phase-field Modeling of Li and Mg Electrodeposition Morphologies** – Z. Liu (The Pennsylvania State University), Y. Li (Michigan State University), Y. Yao (University of Houston), L. Q. Chen (The Pennsylvania State University), and Y. Qi (Michigan State University)
- 16:00 **1132** **(Invited) Elucidating Interfacial Phenomena in Li-Metal Based Batteries** – P. B. Balbuena (Texas A& M University)
- 16:40 **1133** **(Invited) Heat Generation in Batteries Under Extreme Fast Charge: A Multi-Scale Perspective** – S. Santhanagopalan, N. Sunderlin, K. Fink, A. Saxon, and C. Yang (National Renewable Energy Laboratory)
- 17:20 **1134** **(Invited) Equivalent Circuit Modeling for EIS on Structured Electrode in LIB** – T. Osaka and H. Nara (Research Organ. for Nano & Life Innovation, Waseda Univ.)

G01**Silicon Compatible Emerging Materials, Processes, and Technologies for Advanced CMOS and Post-CMOS Applications 9**Electronics and Photonics / Dielectric Science and Technology
City View 2, Dallas Sheraton Hotel**Ferroelectrics Materials and Devices – 08:30 – 09:30****Chair(s):** Kuniyuki Kakushima and Zia Karim

- 08:30 **1180** *(Invited)* **A Ferroelectric Semiconductor Field-Effect Transistor** – M. Si and P. D. Ye (Purdue University)
- 09:10 **1181** **Ferroelectric Properties of Si Doped HfO₂ Thin Films with NiSi₂ As Bottom Electrode** – J. Molina-Reyes (Tokyo Institute of Technology, National Inst. of Astrophysics, Optics and Electronics), H. Iwatsuka, T. Hoshii, S. I. Ohmi, H. Funakubo, A. Hori, I. Fujiwara, H. Wakabayashi, K. Tsutsui, and K. Kakushima (Tokyo Institute of Technology)

Technologies for Advanced Integrated Circuits 1 – 10:00 – 12:00**Chair(s):** Paul J. Timans and Zia Karim

- 10:00 **1182** *(Invited)* **Challenges and Opportunities in the Modeling of Novel Devices and Materials for Logic Applications** – M. Luisier, A. Szabo, C. Klinkert, C. Stieger, M. Rau, T. Agarwal, and Y. Lee (ETH Zurich)
- 10:40 **1183** *(Invited)* **Laser Thermal Annealing for Low Thermal Budget Applications: From Contact Formation to Material Modification** – K. Huet, T. Tabata, J. Aubin, B. Curvers, F. Mazzamuto (SCREEN-LASSE, Gennevilliers, France), and Y. Mori (SCREEN Semiconductor Solutions, Co., Ltd., Hikone, Japan)
- 11:20 **1184** *(Invited)* **Cluster-Preforming-Deposited Si-Rich W Silicide: A New Contact Material for Advanced CMOS** – N. Okada, N. Uchida, S. Ogawa, and T. Kanayama (AIST)

Dielectric Science and Technology Division Thomas D. Callinan Award Address – 14:00 – 14:50**Chair(s):** Durgamadhab Misra

- 14:00 **Introductory Remarks**
- 14:10 **1185** *(Dielectric Science and Technology Division Thomas D. Callinan Award Address)* **Colorful Adventures in the Field of Dielectrics Science: Some Highs and Lows with a Touch of a Chilly Forecast** – S. W. King (Intel Corporation)

Processes for Advanced Integrated Circuits – 14:50 – 17:00**Chair(s):** Stefan De Gendt and Yaw S. Obeng

- 14:50 **1186** *(Invited)* **Area Selective Atomic Layer Deposition As an Emerging Process for Advanced Nanofabrication** – D. Bobb-Semple, T. L. Liu, and S. F. Bent (Stanford University)
- 15:30 **Break**

- 16:00 **1187** **Thermal Resistance in ALD Grown Dielectric Thin Films** – E. A. Scott (University of Virginia), S. W. King (Intel Corporation), S. Smith (Sandia National Laboratories), J. Gaskins, J. Ihlefeld, and P. Hopkins (University of Virginia)

- 16:20 **1188** **Hollow Cathode Plasma (HCP) Enhanced Atomic Layer Deposition of Silicon Nitride (SiN_x) Thin Films Using Pentachlorodisilane (PCDS)** – S. M. Hwang, A. L. N. Kondusamy, Q. Zhiyang, H. S. Kim, J. Kim (The University of Texas at Dallas), B. K. Hwang, X. Zhou, M. Telgenhoff, and J. Young (The Dow Chemical Company)

- 16:40 **1189** **Co-Planar Nano-Resistor Devices** – Y. Kuo and S. Zhang (Texas A&M University)

G02**Processes at the Semiconductor Solution Interface 8**Electronics and Photonics / Dielectric Science and Technology / Electrodeposition / Physical and Analytical Electrochemistry
City View 3, Dallas Sheraton Hotel**Processes at the Semiconductor Solution Interface - Session 1 – 08:20 – 09:40****Chair(s):** Colm O'Dwyer and Vidhya Chakrapani

- 08:20 **1201** *(Invited)* **Intermediates in PEC Water Oxidation — How They Come and How They Go** – A. Braun (Empa)
- 09:00 **1202** **Evaluating the Intrinsic Material Stability at the Semiconductor/Electrolyte Interface for Solar Fuel Production** – W. Yu and N. S. Lewis (California Institute of Technology)
- 09:20 **1203** **Controlling the Performance of Si(111) Photoelectrodes Via Molecular Modification** – D. G. Boucher and M. J. Rose (University of Texas at Austin)

Processes at the Semiconductor Solution Interface - Session 2 – 10:00 – 12:20**Chair(s):** Philippe M. Vereecken and Andrew Campion Hillier

- 10:00 **1204** *(Invited)* **A New Perspective for Photoelectrochemical Water Splitting: Black TiO₂ Nanotubes** – P. Schmuki (University of Erlangen-Nuremberg), N. Liu (University of Erlangen-Nuremberg (FAU)), and M. Altomare (University of Erlangen-Nuremberg)
- 10:40 **1205** **Oxides of Manganese As Efficient Bifunctional Electrocatalysts** – I. Roy, Q. Wang, and V. Chakrapani (Rensselaer Polytechnic Institute)
- 11:00 **1206** **Band Alignment of *N*- and *P*- Doped InP at Electrolyte and Ultra High Vacuum Junctions: Fundamental Correlation between the Open Circuit Potential Under Illumination and XPS Photopeak Energy** – P. C. Rakotoarimanana, M. Frégnaux, N. Simon, A. Etcheberry, and A. M. Gonçalves (Institut Lavoisier de Versailles UMR8180 CNRS-UVSQ)

Tuesday, May 28

- 11:20 **1207** **Characterization and (Electro)Chemical Studies of Halide-Passivated Ge (100) Surfaces in Acidic Solutions** – G. H. A. Abrenica (KU Leuven, imec), M. V. Lebedev (Ioffe Institute), H. Le (IMEC), A. Hajduk (TU Darmstadt), M. Fingerle (Darmstadt University of Technology), T. Mayer (Darmstadt University of Technology, Germany), S. De Gendt (KU Leuven, imec), and D. H. van Dorp (IMEC)
- 11:40 **1208** **Activation of Iridium Electrodes for Neural Stimulation** – R. A. Frederick, A. Joshi-Imre, Y. I. Meliane (The University of Texas at Dallas), P. Troyk (Sigenics, Inc, Illinois Institute of Technology), and S. F. Cogan (The University of Texas at Dallas)
- 12:00 **1209** **Morphological Evolution of Photoelectrodeposited Semiconductor Nanopatterns in Response to Dynamic Optical Inputs** – K. R. Hamann, A. I. Carim, M. C. Meier, and N. S. Lewis (California Institute of Technology)

Processes at the Semiconductor Solution Interface - Session 3 – 14:00 – 17:00

Chair(s): Colm O'Dwyer and Vidhya Chakrapani

- 14:00 **1210** **(Invited) Electrodeposition of Semiconductors: An Emerging and Hugely Popular Art** – K. Rajeshwar (University of Texas)
- 14:40 **1211** **Quantum-Enhanced Hydrogen Evolution Reactions in a Monolayer Crystal** – M. Yan (University of Washington), M. Brischetto (University of Washington), C. McCune, and J. Yang (University of Washington)
- 15:00 **1212** **Semiconductor Nanostructure Tailoring Via Spontaneous Interface Shaping for Light-Collection Maximization** – A. I. Carim, N. A. Batarra, A. Premkumar, H. A. Atwater, and N. S. Lewis (California Institute of Technology)
- 15:20 **1213** **Ionic Bombardment to Tune the Electrochemical Properties of a Semiconductor.** – D. Aureau, M. Frégnaux, M. Bouttemy, J. Vigneron, N. Simon, A. Etcheberry, and A. M. Gonçalves (Institut Lavoisier de Versailles UMR8180 CNRS-UVSQ)
- 15:40 **Break**
- 16:00 **1214** **Real-Time Detection and Diagnosis of Abnormalities in Electroplating Baths - Copper Damascene Process Case Study** – A. Jaworski, H. Wikiel, and K. Wikiel (Technic, Inc.)
- 16:20 **1215** **Cyclic Voltammetry of Ge and Te in Basic Conditions: An Investigation of Surface Coverages.** – P. W. Sisk and J. L. Stickney (University of Georgia)

- 16:40 **1216** **Metal-Assisted Chemical Etching for Simple, Cost-Effective, and Large-Scale III-V Semiconductor Nanofabrication** – T. S. Wilhelm (Rochester Institute of Technology, NanoPower Research Laboratories), A. P. Kolberg, Z. Wang, C. W. Soule (Rochester Institute of Technology), M. A. Baboli (Rochester Institute of Technology, NanoPower Research Laboratories), J. Yan (Matrix Opto Co., Ltd.), S. F. Preble (Rochester Institute of Technology), and P. K. Mohseni (Rochester Institute of Technology, NanoPower Research Laboratories)

Lone Star B/C, Dallas Sheraton Convention Center

G02 Poster Session – 18:00 – 20:00

- **1217** **Influence of Additives on Formation of through-Si Via in Si Substrate Using Metal Assisted Chemical Etching** – T. Shimizu, S. Hanatani, T. Yorioka, R. Niwa, T. Ito, and S. Shingubara (Kansai University)
- **1218** **Characterization of Silicon Nanowires Reflectance By Effective Index Due to Air-Silicon Ratio** – P. K. Koech, M. Ogini, S. Mohan, A. Alice Francis, M. Deo, S. Albin (Department of Engineering, Norfolk State University), and K. B. Sundaram (Univ. of Central Florida)

G03 Organic Semiconductor Materials, Devices, and Processing 7

Electronics and Photonics
City View 4, Dallas Sheraton Hotel

OLEDs and Photovoltaics – 08:30 – 10:55

Chair(s): Lluís F. Marsal

- 08:30 **Welcoming Remarks**
- 08:35 **1232** **(Invited) Simulation of CdSe Based Quantum Dot Hybrid Light Emitting Diodes Using Tcad Continuous Models** – R. Grassi (Silvaco Inc), I. Arroyo, B. Iniguez (Univ of Rovira I Virgili), T. Drevon, A. Plews (silvaco europe ltd), S. Chourou, M. Townsend (Silvaco Inc), and A. Nejim (silvaco europe ltd)
- 09:05 **1233** **(Invited) Roll Coated Organic Dye-Based Photovoltaics for Indoor Energy Harvesting Applications** – G. C. Welch (University of Calgary)
- 09:35 **Break**
- 10:05 **1234** **(Invited) Efficient Non-Fullerene Polymer Solar Cells** – J. G. Sanchez, J. Ferré-Borrull, J. Pallares, and L. F. Marsal (Universitat Rovira i Virgili)
- 10:35 **1252** **Surmofs and CcnCs As Novel Tuneable Metal-Organic Materials for Photonic, Electronic, Optoelectronic and Thermoelectric Applications** – E. Redel (IFG (institute of Functional Interfaces))

Sensors – 11:05 – 12:05

Chair(s): Hagen Klauk

- 11:05 1236 **(Invited) Morphological Engineering for Polymer-Based Electrochemical Sensors** – C. H. Kim (Gachon University)
- 11:35 1237 **(Invited) Emerging Designs for Polymer-Based Energy Storage Devices and Sensors** – K. Wang (University of California San Diego), Z. Wu (UC San Diego), J. Azoulay (University of Southern Mississippi), and T. N. Ng (University of California San Diego)

Modeling and Parameter Extraction – 14:00 – 17:30

Chair(s): Benjamin Iniguez

- 14:00 1238 **(Invited) Physics-Based Compact Model for Organic Thin-Film Transistors with a Universal Charge Expression for Quasi-Static Operation** – A. Kloes, J. Pruefer, J. Leise, G. Darbandy (TH Mittelhessen - University of Applied Sciences), and H. Klauk (Max Planck Institute for Solid State Research)
- 14:30 1239 **(Invited) Compact Modeling of I-V and C-V Characteristics in OTFTs from 125K to 350K** – B. Iniguez, H. Cortes-Ordóñez (University Rovira i Virgili, DEEEiA), A. Cerdeira (CINVESTAV-IPN), M. Estrada (CINVESTAV-IPN, Mexico), S. Jacob (CEA Liten), C. Haddad (CEA-LITEN, Grenoble, France), G. Ghibaudo (IMEP-LAHC MINATEC/INPG, Grenoble 38000, France), and F. Mohamed (Silvaco France)
- 15:00 1240 **Improved Electron Injection and Transport in Semiconducting Polymers By Doping with Guanidino-Functionalized Aromatic Compounds** – S. Schneider (Heidelberg University, Physical Chemistry, Heidelberg University, Centre f Advanced Materials), R. Lorenz, H. J. Himmel (Heidelberg University, Inorganic Chemistry), and J. Zaumseil (Heidelberg University, Physical Chemistry)
- 15:20 **Break**
- 15:40 1241 **(Invited) Organic Molecular Electrets: Multifaceted Complexity of Dipole Effects on Charge Transfer** – V. I. Vullev (University of California, Riverside)
- 16:10 1242 **(Invited) Seebeck Coefficient Model Based on Hopping Transport** – L. Li and N. Lu (Chinese academy of sciences)
- 16:40 1243 **(Invited) Evolutionary Parameter Extraction for Organic TFT Compact Models Including Contact Effects** – A. Romero, J. González (Universidad de Granada), R. Picos (Universitat de les Illes Balears), M. J. Deen (McMaster University), and J. A. Jiménez-Tejada (Universidad de Granada)
- 17:10 1244 **A Kinetic Study of Cationic Polymer Chemical Vapor Deposition** – D. J. Giambra and W. Tenhaeff (University of Rochester)

H01

Wide Bandgap Semiconductor Materials and Devices 20

Electronics and Photonics

Austin Ballroom 1, Dallas Sheraton Hotel

GaN based Materials and Devices 1 – 09:00 – 12:10

Chair(s): Jennifer K. Hite and Marko J Tadjer

- 09:00 1273 **(Invited) Top-Down Etching of III-Nitride Nanostructures** – G. T. Wang, B. Leung (Sandia National Laboratories), M. C. Tsai (The University of New Mexico), B. A. Kazanowska, K. S. Jones (University of Florida), and K. R. Sapkota (Sandia National Laboratories)
- 09:30 1274 **Lateral GaN Jfet Devices on Large Area Engineered Substrates for Robust Power Switching** – T. J. Anderson, J. C. Gallagher (NRL), G. M. Foster (U.S. Naval Research Laboratory), A. D. Koehler (Naval Research Laboratory), M. J. Tadjer (U.S. Naval Research Laboratory), K. D. Hobart (Naval Research Laboratory), O. Aktas (Qromis), V. Odnoblyudov (Qromis, Inc.), C. Basceri (QROMIS, Inc.), and F. J. Kub (U.S. Naval Research Laboratory)
- 09:50 **Break**
- 10:20 1275 **(Invited) Coupled Experimental and Numerical Investigation of High-Voltage GaN HEMTs** – Y. Cui, A. El Helou, and P. E. Raad (Southern Methodist University)
- 10:50 1276 **(Invited) New Avenues for Exploration and Applications of GaN** – I. Tiginyanu (Technical University of Moldova)
- 11:20 1277 **(Invited) Growth and Characterization of GaN Based Multi-Channel FETs** – A. Xie, E. Beam (Qorvo), and Y. Cao (Qorvo Inc.)
- 11:50 1278 **Magnetic III-N Semiconductors Based on Rare Earth Doping** – J. M. Zavada (New York University)

GaN based Materials and Devices 2 – 14:00 – 17:10

Chair(s): Travis J. Anderson and John M Zavada

- 14:00 1279 **(Invited) Limits to Phonon Thermal Boundary Resistance across GaN Interfaces** – P. Hopkins (University of Virginia, Charlottesville)
- 14:30 1280 **Improved Output Power and Electromigration Behavior of Ultraviolet GaN-Based Light-Emitting Diode By Using Agpdcu Reflector** – K. B. Sim, S. J. Yoon, and T. Y. Seong (Korea University)
- 14:50 1281 **Size Effects on the Cross-Plane Thermal Conductivity of Transparent Conducting Indium Tin Oxide (ITO) and Fluorine Tin Oxide (FTO) Thin Films** – D. Olson, C. Rost, J. Gaskins, C. Szejewski, J. Braun, and P. E. Hopkins (University of Virginia)
- 15:10 **Break**
- 15:40 1282 **Hydrogen Sensor for High Temperature and Humid Environment Applications** – S. Jang, M. Kim, H. Shin (Dankook University), and K. H. Baik (Hongik University)

Tuesday, May 28

- 16:00 1283 **Advanced HEMT Characteristics of Epitaxial Quality-improved GaN by Using Patterned Sapphire Substrate** – Y. C. Chien, C. C. Huang (GIEE National Taiwan University), C. K. Yi (GIEE, National Taiwan University), C. W. Yen (E-Beam Lab, GIEE, National Taiwan University), and C. H. Kuan (GIEE NTU)
- 16:20 1284 **Effect of Hydrogen-Ion-Implantation on Self-Separation of Free-Standing Gallium Nitride Wafers Grown By Hvpe** – J. S. Park, J. H. Shim, J. E. Lee, T. H. Shim, and J. G. Park (Hanyang University)
- 16:40 1285 **(Invited) Flexible Multifunctional III-N Semiconductor Materials and Devices for Energy Applications** – J. H. Ryou, S. Shervin, J. Chen, W. Wang, S. K. Oh, S. D. Singh, S. Pouladi, M. Moradnia (University of Houston), M. K. Kwon (Chosun University), J. Y. Kim (Korea Photonics Technology Institute), N. Nabulsi (University of Houston), and H. Johnson (Brigham Young University)

Lone Star B/C, Dallas Sheraton Convention Center

H01 Poster Session – 18:00 – 20:00

Chair(s): Soohwan Jang

- 1286 **GaN Schottky Contact on the Pattern Sapphire Substrate with Reduced Threading Dislocation** – C. C. Lee, C. Y. Chien, W. I. Cheng, C. W. Yen, P. Y. Hu, K. T. Huang (E-Beam Lab, GIEE, National Taiwan University), and C. H. Kuan (Graduate Institute of Electronics Engineering, NTU)
- 1287 **Catalyst-Free Synthesis and Properties of Oxygen-Vacancy-Rich Tungsten Oxide Nanowires** – C. W. Ting, S. M. Yang, and K. C. Lu (National Cheng Kung University)
- 1288 **Photoactive Basic Bismuth Nitrate/Nb₂O₅ Nanocomposites** – J. A. Oliveira (Federal University of São Carlos), R. V. Goncalves (University), C. Ribeiro (Embrapa Instrumentation), F. G. E. Nogueira, and L. A. M. Ruotolo (Federal University of Sao Carlos)
- 1289 **Nanocomposites Based Self-Powered Electronic Systems: Investigating the Materials Properties for Energy Harvesters and Photodetectors** – R. Aepuru and R. V. Mangalaraja (University of Concepcion)

H02

Solid-state Electronics and Photonics in Biology and Medicine 6

Electronics and Photonics / Sensor
Austin Ballroom 2, Dallas Sheraton Hotel

Energy Harvesting, Storage, and Self-Powered Applications 1 – 08:00 – 12:10

Chair(s): Wenzhuo Wu and Pu-Xian Gao

- 08:00 1318 **(Invited) Standardization of Triboelectric Nanogenerators: Progress and Perspectives** – Y. Zi (The Chinese University of Hong Kong)
- 08:30 1319 **(Invited) scavenging of Mechanical Energy Using Piezoelectric and Triboelectric Materials** – M. Lee (Inha University)

- 09:00 1320 **(Invited) Design and Energy Application of Piezoelectric Biomaterials** – R. Yang (Xidian University)
- 09:30 1321 **(Invited) Self-Powered Wearable and Implantable Electrical> Stimulation Devices for Medical Treatments** – X. Wang (University of Wisconsin Madison)
- 10:00 **Break**
- 10:20 1322 **(Keynote) Nature Communications: Overview and Research Highlights** – J. Brant (Springer Nature)
- 11:10 1323 **(Invited) Electrochemical Tuning Sensing and Catalytic Performance of Catalytic Materials -from Nanoscale to Atomic Scale** – J. F. Huang (Department of Chemistry, National Chung Hsing University)
- 11:40 1324 **(Invited) 3D Conformal Additive Printing of Semiconducting Nanocrystals for Energy Harvesting and Biosensing** – Y. Zhang (University of Notre Dame)

Energy Harvesting, Storage, and Self-Powered Applications 2 – 13:30 – 18:00

Chair(s): Rusen Yang and Xudong Wang

- 13:30 1325 **(Invited) Controlled Homo-Epitaxial Growth of Hybrid Halide Perovskites** – S. Xu (University of California, San Diego)
- 14:00 1326 **(Invited) heterostructured “Binary Materials” for Photodetection from Mid-Infrared, Visible, to X-Ray** – T. Wu (UNSW)
- 14:30 1327 **(Invited) what Limits the Intrinsic Carrier Mobility of Two Dimensional Metal Dichalcogenides?** – Y. Liu (The University of Texas at Austin)
- 15:00 1328 **(Invited) Scalably-Nanomanufactured 2-D Tellurene for Ubiquitous Electronics and Smart Sensors** – W. Wu (Purdue University)
- 15:30 **Break**
- 15:40 1329 **(Invited) Single Nanoarray Sensor for Multi-Analyte Detection** – P. X. Gao (University of Connecticut)
- 16:10 1330 **(Invited) Self-Powered Medical Electronics** – Z. Li (Beijing Institute of Nanoenergy and Nanosystems,CAS)
- 16:40 1331 **(Invited) Biomimetic Approaches for the Practical Utilization of Discrete Liquid-Solid Contact Electrification** – D. S. Kim (POSTECH)
- 17:10 1332 **(Invited) Nanowire-Enabled Low-Voltage Electroporation for Microbial Inactivation in Water** – X. Xie (Georgia Institute of Technology)
- 17:40 1333 **Fully Bioabsorbable Capacitor As an Energy Storage Unit for Implantable Medical Electronics** – H. Li (Beihang University), Z. Li (Beijing Institute of Nanoenergy and Nanosystems,CAS), and Y. Fan (Beihang University)

H03**Wearable and Flexible Electronic and Photonic Technologies 2**

Electronics and Photonics / Dielectric Science and Technology / Physical and Analytical Electrochemistry / Sensor / Interdisciplinary Science and Technology Subcommittee
Austin Ballroom 3, Dallas Sheraton Hotel

Wearable and Flexible Electronic and Photonic Technologies - Session 1 – 08:10 – 09:30

Chair(s): Sheng Xu and Wei Gao

- 08:10 1353 *(Invited)* Flexible Human-Machine Interfaces and Damage Robust Stretchable Optoelectronics – B. C. Tee (National University of Singapore)
- 08:50 1354 *(Invited)* Electrically Conductive Silver Nanowire Coatings on Textiles for Personal Thermal Management – P. A. D'Angelo, J. Orlando, J. S. Lum, and E. Hirst (US Army Natick Soldier RDEC)

Wearable and Flexible Electronic and Photonic Technologies - Session 2 – 10:00 – 12:40

Chair(s): Sheng Xu and Wei Gao

- 10:00 1355 *(Invited)* Ferromagnetic, Folded, Soft Composite Material for Skin-Interfaced Electrodes – K. I. Jang (DGIST)
- 10:40 1356 *(Invited)* Biomimetic Electronic Skins for Wearable Sensors – H. Ko (Ulsan National Institute of Science and Technology)
- 11:20 1357 *(Invited)* Self-Powered Textiles for Healthcare Applications – Z. H. Lin (National Tsing Hua University)
- 12:00 1358 Prestress-Driven Optical Modulations of Flexible Oxide Thin Films Processed in Stretching Mode – H. J. Choi, Y. S. Jung, A. Soon (Yonsei university), and Y. S. Cho (Yonsei University)
- 12:20 1359 A Spectroelectrochemical Sweat Sensor for Improved Management of Diabetes Mellitus – D. L. Parr IV and J. Leddy (University of Iowa)

Wearable and Flexible Electronic and Photonic Technologies - Session 3 – 14:00 – 17:00

Chair(s): Wei Gao and Sheng Xu

- 14:00 1360 *(Invited)* Wearable Sweat Sensors – A. Javey (University of California, Berkeley)
- 14:40 1361 *(Invited)* Merging Humans and Machines with Hydrogel Bioelectronics – X. Zhao (MIT)
- 15:20 1362 *(Invited)* Ultraflexible Organic Photonic Devices – T. Yokota (University of Tokyo) and T. Someya (The University of Tokyo)
- 16:00 1363 *(Invited)* Gold Electronic Skins – W. Cheng (Monash University, Melbourne Centre for Nanofabrication)
- 16:40 1364 Multi-Responsive Hydrogel Based Flexible Sensors for Plants/Animals Metabolic Stress Analytics – S. Mugo, J. Alberkant, N. Yu, and W. Lu (MacEwan University)

Lone Star B/C, Dallas Sheraton Convention Center

H03 Poster Session – 18:00 – 20:00

- 1365 Study of Fluorescent Dichroic Liquid Crystal Dyes for Wearable and Flexible Device – X. Li and Z. Wang (Dalian University of Technology)
- 1366 Evaluation of on-Body Performance of a Sweat-Based Lactate Sensor from Low Volumes of Passive Eccrine Sweat – A. Bhide (University of Texas at Dallas), S. Prasad (The University of Texas at Dallas), and S. Muthukumar (Enlisen LLC)

H01**Hydrogen or Oxygen Evolution Catalysis for Water Electrolysis 5**

Energy Technology / Industrial Electrochemistry and Electrochemical Engineering / Physical and Analytical Electrochemistry
State Room 2, Dallas Sheraton Convention Center

Alkaline Electrolysis-OER 1 – 08:00 – 12:20

Chair(s): Yu Seung Kim and Karl Mayrhofer

- 08:00 Welcoming Remarks
- 08:05 1406 *(Invited)* Electrolyte Oxidation Limits the Life of Alkaline Membrane Water Electrolyzer – Y. S. Kim, D. Li (Los Alamos National Laboratory), I. Matanovic (Los Alamos National Laboratory, University of New Mexico), A. S. Lee (Los Alamos National Lab), and H. T. Chung (Los Alamos National Laboratory)
- 08:35 1407 3D Printed Electrodes: A New Platform for Studies of Water Oxidation – P. L. dos Santos (University of Campinas), S. J. Rowley-Neale, C. E. Banks (Manchester Metropolitan University), and J. A. Bonacin (University of Campinas)
- 08:55 1408 Transition-Metal-Doped TiO₂ Decorated Ni₂ Layered Double Hydroxide Catalyst in Alkaline Oxygen Evolution Reaction – M. C. Tsai (National Taiwan University of Science and Technology), B. J. Hwang (NTUST), X. D. Lin, and W. N. Su (National Taiwan University of Science and Technology)
- 09:15 1409 Functionalized Phosphorene Quantum Dots As Efficient Electrocatalyst for Oxygen Evolution Reaction – R. Prasannachandran (IISER- Thiruvananthapuram), T. V. Vineesh (IISER Thiruvananthapuram), A. Anil (IISER- Thiruvananthapuram), B. M. Krishna (CMS College, kottayam), and M. M. Shaijumon (IISER Thiruvananthapuram)
- 09:35 Break
- 09:50 1410 *(Invited)* Fundamental Insights into Catalyst Stability in Low-Temperature Electrolysis – K. Mayrhofer (Helmholtz-Institute Erlangen-Nürnberg), S. Cherevko (Forschungszentrum Jülich GmbH), O. Kasian, S. Geiger, and M. Ledendecker (Max-Planck-Institut für Eisenforschung GmbH)

Tuesday, May 28

- 11:20 **1411** **Vanadium Based Full Water Splitting Electrocatalysts** – A. Saxena (Missouri University of Science & Technology), J. Masud (The University of Kansas), and M. Nath (Missouri University of Science & Technology)
- 10:40 **1412** **Oxygen Evolution Reaction in Alkaline Media: Electrical Double Layer and Interfacial Interactions** – G. Li and A. Chuang (University of California Merced)
- 11:00 **1413** **Synthesis of Co-Fe Alloy 1D Nanocone Array Electrodes with Aluminum Oxide Template for Water Splitting Reaction.** – K. Skibinska, D. Kutyla, K. Koleczyk, R. Kowalik, and P. Zabinski (AGH University of Science and Technology)
- 11:20 **1414** **Activity and Stability Relations on Oxygen Evolution Electrocatalysis** – D. Y. Chung (Argonne National Labroatory), P. P. Lopes (Argonne National Laboratroy), D. Strmcnik, V. Stamenkovic, and N. M. Markovic (Argonne National Laboratory)
- 11:40 **1415** **CuNC₃-Xvx Antiperovskite As a High Performance Catalyst for Oxygen Evolution Reaction** – J. Zhang, L. Du, and Z. Cui (South China University of Technology)
- 12:00 **1416** **Compositional and Microstructural Engineering of Transition Metal Phosphides for Improved Electrocatalytic Performance** – L. Liu (International Iberian Nanotechnology Laboratory (INL)) and J. Xu (International Iberian Nanotechnology Laboratory)

Alkaline Electrolysis-OER 2 – 13:45 – 17:40

Chair(s): Shaun M Alia and Shuo Chen

- 13:45 **Introductory Remarks**
- 13:50 **1417** **(Invited) Nickel Based Electrocatalysts for Water Electrolysis Under Large Current** – S. Chen (University of Houston)
- 14:20 **1418** **MOF Based Electrocatalysts for Electrolytic Water Splitting** – D. S. Raja, H. W. Lin, X. F. Chuah, and S. Y. Lu (National Tsing Hua University)
- 14:40 **1419** **Unique-Structure MoS₂ Grow on Nickel Foam As Highly Efficient Self-Supported Electrode for Oxygen Evolution Reaction** – Z. He, H. Guo, S. Ardoin, J. LaCoste, and L. Fei (University of Louisiana at Lafayette)
- 15:00 **1420** **Ni- and Co-Based Heterogeneous Nanosheet Array As Efficient Electrocatalysts for Oxygen Evolution Reaction from Water** – Y. Li (The Hong Kong Polytechnic University), W. Zhang (The Hong Kong Polytechnic Univeristy), M. Liu, and L. Y. S. Lee (The Hong Kong Polytechnic University)
- 15:20 **1421** **Catalytic Activities of Bismuth-Based Pyrochlore Oxides for Oxygen Evolution in Alkaline Solutions** – K. Kawaguchi, T. Hirai, C. Iketani, and M. Morimitsu (Doshisha University)
- 15:40 **Break**

- 15:50 **1422** **(Invited) ZIF 67 Based Electrocatalysts As Highly Active Oxygen Electrodes for Water Electrolysis** – S. Ghoshal (National Renewable Energy Laboratory), S. Zaccarine, G. C. Anderson (Colorado School of Mines), M. B. Martinez, K. E. Hurst (National Renewable Energy Laboratory), S. Pylypenko (Colorado School of Mines), B. S. Pivovar, and S. M. Alia (National Renewable Energy Laboratory)
- 16:20 **1423** **Oxygen Evolution Reaction of Oxide-Based Material with and without Doping in Alkaline Solution** – K. Matsuzawa, K. Sumi, R. Suzuki (Green Hydrogen Research Center, Yokohama Nat. Univ.), Y. Kuroda, S. Mitsushima (Yokohama National University), A. Ishihara (Institute of Advanced Sciences, Yokohama Nat. Univ.), and K. I. Ota (Green Hydrogen Research Center, Yokohama Nat. Univ.)
- 16:40 **1424** **Improved Components for High Temperature Alkaline Water Electrolysis** – K. Patil, A. Sweet, S. McCatty, W. Greene, and H. Xu (Giner, Inc.)
- 17:00 **1425** **Encapsulation of Metallic Electrocatalysts in Graphitic Shells** – H. Khani, N. S. Grundish (The University of Texas at Austin), D. O. Wipf (Mississippi State University), and J. B. Goodenough (The University of Texas at Austin)
- 17:20 **1426** **Ni-Fe-Based Nanostructures for Oxygen Evolution Reaction in Alkaline Media** – R. Manso (Univerisity of Arkansas), A. Prashant, L. F. Greenlee, and J. Chen (University of Arkansas)

102

Materials for Low Temperature Electrochemical Systems 5

Energy Technology / Physical and Analytical Electrochemistry
Houston Ballroom B, Dallas Sheraton Convention Center

Fuel Cell Performance and Characterization 3 – 08:00 – 09:40

Chair(s): Luigi Osmieri and Yossef A Elab

- 08:00 **1510** **Investigation of Ni/C and Pt/C Catalyst Stability in an Anion Exchange Membrane (AEM) Fuel Cell** – L. Xie and D. W. Kirk (University of Toronto)
- 08:20 **1511** **Probing the Nanoscale Morphology and Conductance of Anion Exchange Membrane Fuel Cells By Atomic Force Microscopy (AFM)** – A. Barnes (Univ of California - Santa Barbara), S. K. Buratto (University of California, Santa Barbara), Y. Du (University of Massachusetts, Amherst), and B. E. Coughlin (University of Massachusetts Amherst)
- 08:40 **1512** **Use of a Segmented Cell for the Development of PGM-Free Cathode Catalyst Layers for Polymer Electrolyte Fuel Cells** – L. Osmieri, S. A. Mauger, E. Klein, M. Ulsh, K. C. Neyerlin, and G. Bender (National Renewable Energy Laboratory)
- 09:00 **1513** **PGM-Free Electrode Development and Optimization Using H₂ Limiting Current** – G. Wang, A. G. Star, L. Osmieri, and K. C. Neyerlin (National Renewable Energy Laboratory)

- 09:20 1514 **Alkaline Fuel Cell Performance of Saturated N-Heterocyclic Cationic Multiblock Polymers** – M. Hwang (Texas A&M University), C. Willis (Kraton Performance Polymers, Inc.), and Y. A. Elabd (Texas A&M University)
- Batteries and Supercapacitors – 10:00 – 12:20**
Chair(s): Megan B. Sassin and William E. Mustain
- 10:00 1515 **(Invited) Enabling Conversion-Based Metal Oxide Anodes for Li Ion Batteries through Material Confinement** – B. Ng and W. E. Mustain (University of South Carolina)
- 10:40 1516 **(Invited) New Insight of NaLiFePO₄f As a High Voltage Cathode Material for Lithium-Ion Battery** – Z. W. Bai (The Hong Kong University of Science and Technology, The Hong Kong Polytechnic University), M. Shao (The Hong Kong University of Science and Technology), and G. Chen (The Hong Kong Polytechnic University)
- 11:20 1517 **Na₂SO₄-Polyacrylamide Neutral pH Polymer Electrolytes for Electrochemical Capacitors** – A. Virya, J. Abella, A. Grindal, and K. Lian (University of Toronto)
- 11:40 1518 **Low Temperature Performance of MnOx@Carbon Nanofoam-Based Ecs with Neutral pH-Based Aqueous Electrolytes** – M. B. Sassin (U.S. Naval Research Laboratory), K. Brant (Formerly of U.S. Naval Research Laboratory), C. L. Pitman (NRL/NRC Postdoctoral Associate), J. Wallace (Formerly of Nova Research Inc.), and J. W. Long (U.S. Naval Research Laboratory)
- 12:00 1519 **Miniaturized Electrochemical Supercapacitor with Patterned Horizontally Aligned Carbon Nanotube Sheets** – B. Dousti, Y. I. Choi, and G. S. Lee (University of Texas at Dallas)
- General Electrocatalysis 4 – 14:00 – 18:20**
Chair(s): Lior Elbaz and Wataru Sugimoto
- 14:00 1520 **(Invited) Materials Design for Microbial Bioelectrochemical Devices** – S. D. Minteer (University of Utah)
- 14:40 1521 **Palladium-Ceria Nanocatalyst for Hydrogen Oxidation in Alkaline Media: Optimization of the Pd-CeO₂ Interface** – H. Yu (University of Connecticut), E. S. Davydova (Technion Israel Institute of Technology), U. Ash (Technion – Israel Institute of Technology), H. A. Miller (CNR-ICCOM), L. J. Bonville (University of Connecticut), D. R. Dekel (Technion Israel Institute of Technology), and R. Maric (Center for Clean Energy Engineering)
- 15:00 1522 **Platinum-Iridium Modified Gold Nanoparticles Catalysts for Electrooxidation of Ethanol in Alkaline Media** – Z. Liang, L. Song (Chemistry Department, Brookhaven National Laboratory), S. Deng, Y. Zhu (Dep. Cond. Matter Phys. Mater. Sci., Brookhaven Nat. Lab.), E. Stavitski (Brookhaven National Laboratory), R. R. Adzic (Senior Scientist Emeritus), J. Chen (University of Arkansas), and J. X. Wang (Chemistry Department, Brookhaven National Laboratory)
- 15:20 1523 **Direct Electro-Oxidation of Dimethyl Ether on Pt-Cu Nanoparticles** – L. Elbaz (Bar Ilan University)
- 15:40 1524 **Graphene Oxide Modified Pt/C and Pt₂Ru₃/C for Enhanced Carbon Monoxide Tolerable Fuel Cell Anode Catalyst** – M. S. Islam, D. Takimoto (Shinshu University), D. Mochizuki (Tokyo Denki University), S. Hideshima, and W. Sugimoto (Shinshu University)
- 16:00 1525 **Electrocatalysis of Ketjenblack-Supported Ru-Ir Cathode for the Electrohydrogenation of Toluene to Methylcyclohexane in the Organic Hydride System** – Y. Inami (Tokyo Institute of Technology), S. Nagamatsu, K. Asakura (Hokkaido University), S. Iguchi, and I. Yamanaka (Tokyo Institute of Technology)
- 16:20 1526 **Cu-Pt Bi-Metallic Catalysts By Continuous Electroless Deposition for Methanol Oxidation Reaction** – B. A. Tavakoli Mehrabadi, W. Xiong, G. Caldwell, J. R. Regalbuto, J. W. Weidner, and J. R. Monnier (University of South Carolina)
- 16:40 1527 **Electrochemical Partial Oxidation of Alkenes: Understanding Selectivity and Reaction Mechanisms** – B. Seger, A. Winiwarter, S. B. Scott, I. Chorkendorff (Technical University of Denmark), L. Silvioli, and J. Rossmeis (University of Copenhagen)
- 17:00 1528 **Enhanced Anodic Reaction of Dimethyl Ether (DME) on Ptpdsn Based Catalysts for High Power Low Temperature Fuel Cells** – A. Schechter, H. Teller, and D. Kashyap (Department of Chemical Sciences, Ariel University)
- 17:20 1529 **Effect of Heat Treatment and Bath Compositions on the Performance of Co-Ni-Mo-P Electrocatalysts for Ethanol Electro-Oxidation** – E. E. Kalu (Florida A&M University - Florida State University COE) and W. Chaitree (Florida State University)
- 17:40 1530 **CVD Graphene Modified with Au Nanoparticles As Electrocatalysts for Sodium Borohydride and Hydrazine Oxidation** – L. Tamašauskaitė-Tamašiūnaitė, A. Balčiūnaitė, A. Zabielaitytė, J. Vaičiūnienė, and E. Norkus (Center for Physical Sciences and Technology)
- 18:00 1531 **Nitrogen-Doped Carbon Catalysts Modified with Au-M (M = Co, Ni, Cu) Nanoparticles As the Anode Material for Direct Borohydride-Hydrogen Peroxide Fuel Cells** – A. Balčiūnaitė, J. Vaičiūnienė (Center for Physical Sciences and Technology), I. Kruusenberg, K. Kaare (National Institute of Chemical Physics and Biophysics), A. Volperts, G. Dobeles, A. Zurins (Latvian State Institute of Wood Chemistry), L. Tamašauskaitė-Tamašiūnaitė, and E. Norkus (Center for Physical Sciences and Technology)

Solar Fuels and Plasmonics – 07:55 – 09:35

Chair(s): Heli Wang and Nianqiang (Nick) Wu

- 07:55 1617 **(Keynote) Generation of Hot Electrons in Plasmonic and Hybrid Metastructures for Photochemical Applications** – A. O. Govorov (UESTC, Ohio University), L. V. Besteiro (UESTC, INRS), L. Chang, and Z. Wang (UESTC)
- 08:30 1618 **(Keynote) Stable Mixed-Anion Photocatalysts for Visible-Light-Induced Water Splitting** – R. Abe (CREST)
- 09:05 1619 **(Invited) Separations in Solar Fuels Systems** – F. A. Houle (Joint Center for Artificial Photosynthesis)

Solar Fuel Generation 2 – 09:55 – 12:10

Chair(s): Bunsho Ohtani

- 09:55 1620 **(Invited) Red TiO₂ and Ferroelectric Photocatalysts** – G. Liu (Institute of Metal Research, Chinese Academy of Sciences)
- 10:25 1621 **(Invited) Rational Design of Hybrid Photoelectrode Assemblies for Solar Fuel Generation** – C. Janáky (ELI-ALPS Research Institute)
- 10:55 1622 **(Invited) Proton Pump for Solar Energy Transformation: from Nano- to Meso-Scale Architectures** – E. A. Rozhkova (ANL)
- 11:25 1623 **Production of C₄ Species from the Electrochemical Reduction of CO on Nanostructured Cu/CuO_x Catalyst** – J. M. Spurgeon (Conn Center for Renewable Energy Research) and J. Strain (Conn Center, University of Louisville)
- 11:40 1624 **Chemical Consequences of Flow- CO₂ Reduction in a Microfluidic Flow Cell** – D. A. Henckel, S. Bhargava, A. A. Gewirth, and P. J. A. Kenis (Intl. Institute of Carbon Neutral Energy Research, University of Illinois Urbana-Champaign)
- 11:55 1625 **Electrocatalytic Hydrogenation of Benzaldehyde: Unexpected Enhancing Effect By Co-Adsorbed Proton Donor** – U. Sanyal, K. Koh, L. C. Meyer, A. Karkamkar, J. Holladay, D. M. Camaioni, O. Y. Gutiérrez Tinoco (Pacific Northwest National Laboratory), and J. A. Lercher (Technische Universität München)

Fundamental Studies on Semiconductors 1 – 13:40 – 15:25

Chair(s): Frank E. Osterloh and Vaidyanathan Subramanian

- 13:40 1626 **Surface Structural Evolution of Pd Nanosheets during Aging and Their Effect on (Electro-)Catalytic Activities** – Y. Zhang (Hong Kong University of Science and Technology, Georgia Institute of Technology), Y. Xia (Georgia Institute of Technology), and M. Shao (Hong Kong University of Science and Technology)

- 13:55 1627 **First-Principles Simulations of Stability, Optical and Electronic Properties of Competing Phases in Chalcopyrite-Based Photoelectrodes** – J. B. Varley (Lawrence Livermore National Laboratory), A. Sharan (University of Delaware), T. Ogitsu (Lawrence Livermore National Laboratory), A. Janotti (University of Delaware), A. D. DeAngelis, and N. Gaillard (University of Hawaii)
- 14:10 1628 **Design of Heterogeneous Photocatalysis Based on Energy-Resolved Distribution of Electron Traps** – B. Ohtani (Institute for Catalysis, Hokkaido University), A. Nitta (Graduate School of Environmental Science, Hokkaido Univ.), M. Takase (Graduate School of Engineering, Muroran Institute of Tech), and M. Takashima (Graduate School of Environmental Science, Hokkaido Univ.)
- 14:25 1629 **Operando Spectroelectrochemistry Approaches for Aqueous CO₂ Reduction** – K. Jiang (University of California, Berkeley, Lawrence Berkeley National Laboratory) and A. T. Bell (University of California, Berkeley)
- 14:40 1630 **Crystal Phase Dependence on HER Water Splitting Performance of Earth-Abundant Electrocatalysts** – D. D. Rodene, E. H. Eladgham, I. Arachchige, and R. B. Gupta (Virginia Commonwealth University)
- 14:55 1631 **(Invited) Element-Specific Measurement of Hole Transport and Kinetics in a Ni-TiO₂-Si Photoelectrode Using Transient Extreme Ultraviolet Spectroscopy** – S. K. Cushing (California Institute of Technology)

Photoelectrochemical Assembly and Systems – 15:45 – 18:00

Chair(s): Frank E. Osterloh and Vaidyanathan Subramanian

- 15:45 1632 **Photoelectrochemical Water Splitting Using Multiple Quantum Well Photovoltaic Devices** – J. L. Young, C. Aldridge, C. Barraugh (National Renewable Energy Laboratory), I. Barraza (National Renewable Energy Laboratory, University of Texas, El Paso), D. J. Friedman, T. G. Deutsch, and M. A. Steiner (National Renewable Energy Laboratory)
- 16:00 1633 **Solar-to-Hydrogen Efficiency: Shining Light on Photoelectrochemical Device Performance** – J. L. Young (National Renewable Energy Laboratory), H. Döscher (Philipps-Universität Marburg), J. F. Geisz, J. A. Turner, and T. G. Deutsch (National Renewable Energy Laboratory)
- 16:15 1634 **Surface-Modified Metal Sulfides As Stable H₂ Evolving Photocatalyst in Z-Scheme Water Splitting System with [Fe(CN)₆]^{3-/4-} Redox Mediator Under Visible Light Irradiation** – M. Higashi, T. Shirakawa, H. Matsuoka, O. Tomita, A. Nakada (Kyoto University), and R. Abe (Kyoto University, CREST)
- 16:30 1635 **Scaled Solar Fuel Production System Using Concentrated Integrated Photo-Electrochemical Device** – S. Tembhurne, I. Holmes-Gentle, L. Schwander, and S. Haussener (Lab. of Renewable Energy Science & Engg. (LRESE), EPFL)

- 16:45 **1636** **Sustainable Hydrogen Production Using Water By a Photovoltaic Integrated Electrolyser with Active Area Exceeding 100 cm²** – S. Calnan, E. Kemppainen, S. Aschbrenner, F. Bao, and R. Schlattmann (Helmholtz Zentrum Berlin)
- 17:00 **1637** **Integrated Membrane-Electrode-Assembly Photoelectrochemical Cell Under Various Feed Conditions for Solar Water Splitting** – T. Kistler (Lawrence Berkeley National Laboratory), D. M. Larson (Lawrence Berkeley National Laboratory), P. Agbo (Lawrence Berkeley National Laboratory), K. Walczak (Sandia National Laboratory), I. D. Sharp (Technische Universität München), A. Z. Weber, and N. Danilovic (Lawrence Berkeley National Laboratory)
- 17:15 **1638** **The Interplay between Quantum Efficiency, Light Flux, and Turnover Frequency in Molecular-Modified Photocathodes** – G. F. Moore, B. L. Wadsworth, A. M. Beiler, D. Khusnutdinova, E. A. Reyes Cruz, and S. K. Nanyangwe (Arizona State University)
- 17:30 **1639** **Design of a Solar Device to Transform Wastewater Nitrates to Nitrogen-Species Coupled with Energy and Nutrient Recovery** – L. Barrera and R. Bala Chandran (University of Michigan)
- 17:45 **1640** **Conformal and Continuous Deposition of Bifunctional Cobalt Phosphide Layers on p-Silicon Photocathodes for Improved Solar Hydrogen Evolution** – L. Liu (International Iberian Nanotechnology Laboratory (INL)) and S. M. Thalluri (International Iberian Nanotechnology Laboratory)
- 09:00 **1672** **(Invited) Atomically Dispersed Electrocatalysts for High-Efficiency Ambient N₂ Fixation** – L. Han (Center for Funct. Nanomater., Brookhaven National Lab.), X. Liu (Tianjin University of Technology), R. Lin (CFN, Chemistry Division, Brookhaven National Laboratory), Z. Liang (Chemistry Department, Brookhaven National Laboratory), E. Stavitski (Brookhaven National Laboratory), J. Luo (Tianjin University of Technology), R. R. Adzic (Chemistry Department, Brookhaven National Laboratory), and H. L. Xin (University of California, Irvine)
- 09:20 **1673** **(Invited) Understanding Metal-Based Catalysts for Electrochemical Ammonia Synthesis** – X. Feng (University of Central Florida)
- 09:40 **1674** **(Invited) Electrochemical Nitrogen Fixation Under Ambient Conditions** – G. Chen, L. Ding, R. Luo, and H. Wang (South China University of Technology)
- 10:00 **1675** **(Invited) A Systematic Study of Ammonia Synthesis By Electrochemical Reduction of N₂ over Cu** – N. Balaji, A. Prajapati, and M. R. Singh (University of Illinois at Chicago)
- 10:20 **Break**
- 10:40 **1676** **Design of Materials for Electroreduction of Nitrogen to Ammonia: A Computational Perspective** – I. Matanovic (University of New Mexico, Center for Micro-Engineered Materials) and F. H. Garzon (University of New Mexico)
- 11:00 **1677** **A Bimetallic Electrocatalyst Platform for Understanding the Roles of Surface Chemistry and Functionalization on Nitrogen Reduction to Ammonia** – L. F. Greenlee, S. I. P. Bakovic (University of Arkansas), C. Loney, J. Renner (Case Western Reserve University), S. Maheshwari (Pennsylvania State University), and M. J. Janik (The Pennsylvania State University)
- 11:20 **1678** **Electrochemical Synthesis of Ammonia Using Origami-like Molybdenum Carbide Nanoflakes As Nitrogen Reduction Reaction Catalyst** – K. P. Ramaiyan (Los Alamos National Laboratory), S. Ozden (Los Alamos National Lab), S. Maurya (Los Alamos National Laboratory), S. Komini Babu (Carnegie Mellon University), A. D. Benavidez, F. H. Garzon (University of New Mexico), Y. S. Kim, R. Mukundan, and C. R. Kreller (Los Alamos National Laboratory)
- 11:40 **1679** **Ammonia Electrochemical Synthesis Using Platinum Ruthenium Alloy at Ambient Pressure and Low Temperature** – A. Schechter (Department of Chemical Sciences, Ariel University), R. Manjunatha, and A. Karajic (Ariel University)
- 12:00 **1680** **A Spectroscopic Study on the Electrochemical Nitrogen and Nitrate Reduction Reactions on Rhodium and Ruthenium Surfaces** – Y. Yao, H. Wang (Southern University of Science and Technology), H. Li (SUSTech), and M. Shao (Hong Kong University of Science and Technology)

104 Energy Conversion Systems Based on Nitrogen 2

Energy Technology / Physical and Analytical Electrochemistry
Pearl 1, Dallas Sheraton Hotel

Catalysts for Ammonia Electrosynthesis – 08:00 – 12:40
Chair(s): Lauren F. Greenlee, Yuyan Shao and Gang Wu

- 08:00 **1669** **(Invited) Electrochemical Ammonia Synthesis As Potential Alternative to the Haber-Bosch Process** – G. L. Soloveichik (Advanced Research Projects Agency-Energy (ARPA-E))
- 08:20 **1670** **(Invited) Electrochemistry of the N-H Bond: Synthesis and Oxidation of Ammonia** – K. Manthiram (Massachusetts Institute of Technology)
- 08:40 **1671** **(Invited) Iron Catalyst Facilitated Synthesis of Ammonia from N₂ and Water at High Efficiency By Electrolysis** – X. Liu and S. Licht (George Washington University)

- 12:20 1681 **Metal-Organic Framework-Derived Carbon Electrocatalysts for Nitrogen Reduction** – S. Mukherjee (University at Buffalo) and G. Wu (University at Buffalo, the State University of New York)

Ammonia and Other Nitrogen Containing Compounds: Synthesis and Oxidation – 14:00 – 17:20

Chair(s): Julie N. Renner, Shelley D. Minter and Hui Xu

- 14:00 1682 *(Invited)* **Investigating the Photoelectrocatalytic Activity of Titania for Nitrogen Fixation Using Rotating Ring-Disk Electrode Voltammetry** – M. C. Hatzell (Georgia Institute of Technology) and Y. H. Liu (Georgia Institute of Technology)
- 14:20 1683 *(Invited)* **Electrolytic Synthesis of Ammonia at Ambient Conditions from Nitrogen and Acidic Water By a Catalyst-Free, Plasma Process** – R. Hawtof, J. Toth, S. Ghosh, E. Guarr, C. Xu, J. N. Renner, and R. M. Sankaran (Case Western Reserve University)
- 14:40 **Break**
- 15:00 1684 **Surface Modification of Pd Shape-Controlled Nanoparticles for Electrochemical Nitrate Reduction** – J. Lim, J. Park, S. W. Lee (Georgia Institute of Technology), and M. C. Hatzell (Georgia Institute of Technology)
- 15:20 1685 **Thermochemical and Techno-Economic Evaluation of Ammonia Synthesis Via Lithium-Molten Salt Processes** – F. H. Garzon (University of New Mexico), I. Matanovic (Los Alamos National Laboratory, University of New Mexico), and J. Gomez (University of New Mexico)
- 15:40 1686 **Removal of Nitrate and Ammonia from Wastewater** – M. Bagheri Hariri and G. G. Botte (Ohio University)
- 16:00 1687 **Mass Transport Influence on Electrooxidation of Urea for Wastewater Remediation** – K. Carpenter and E. M. Stuve (University of Washington)
- 16:20 1688 **Iridium-Based Catalysts for Electro-Oxidation of Ammonia in Alkaline Media** – L. Song, Z. Liang, and J. X. Wang (Chemistry Department, Brookhaven National Laboratory)
- 16:40 1689 **Binary and Ternary Nanocubes As Electrocatalysts for Ammonia Electrooxidation Reaction** – K. Siddharth (Hong Kong University of Science and Technology), Y. Hong, S. I. Choi (Kyungpook National University), and M. Shao (The Hong Kong University of Science and Technology)
- 17:00 1690 **Direct Ammonia-Fueled Solid Oxide Fuel Cells** – G. Tao (Chemtronergy)

Lone Star B/C, Dallas Sheraton Convention Center

104 Poster Session – 18:00 – 20:00

- 1691 **Pt-Zn Nanocube for Enhanced Mass and Specific Activities in Ammonia Electro-Oxidation Reaction (AOR)** – M. Shao (The Hong Kong University of Science and Technology) and Y. T. Chan (the Hong Kong University of Science and Technology)

- 1692 **Effect of Short Current on the Open Circuit Voltage in a Solid Oxide Fuel Cell** – C. G. Lee, S. Koomson, and E. Arthur (Hanbat National University)

105

Heterogeneous Functional Materials for Energy Conversion and Storage 2

High-Temperature Energy, Materials, & Processes / Battery / Energy Technology / Physical and Analytical Electrochemistry
State Room 4, Dallas Sheraton Convention Center

Solid Oxide Cells 1 – 08:00 – 10:00

Chair(s): Srikanth Gopalan and Wilson K. S. Chiu

- 08:00 1712 *(Keynote)* **A High Performance Tubular Solid Oxide Fuel Cell for Unmanned Autonomous Systems** – D. Chu (U.S. Army Research Laboratory), K. Chu (US Army CERDEC), C. Cook (Army Power Division), and A. DeAnni (US Army CERDEC)
- 08:40 1713 **High-Performance Oxygen Electrodes for Low Temperature Solid Oxide Cells** – Y. A. Chart, M. Y. Lu, and S. A. Barnett (Northwestern University)
- 09:00 1714 **A Novel Strategy to Synthesize Cathode Heterostructures at the Nanoscale for Solid Oxide Fuel Cells (SOFCs) Using a Molten Salt Solvent** – B. Levitas, S. Gopalan (Boston University), and K. Kakinuma (Fuel Cell Nanomaterials Center, University of Yamanashi)
- 09:20 1715 **Triple Conducting Perovskite Oxide Nanocomposites As Oxygen Electrodes for Intermediate-Temperature Protonic Ceramic Cells** – J. Tong, Z. Zhao, S. Mu, and M. Zou (Clemson University)
- 09:40 1716 **Freeze Casting of Tubular Anode Supports for High-Performance Solid Oxide Fuel Cells** – D. Panthi (Kent State University at Tuscarawas), T. Woodson, and Y. Du (Kent State University)

Solid Oxide Cells 2 - Degradation – 10:20 – 12:20

Chair(s): Steven McIntosh and Deryn Chu

- 10:20 1717 *(Keynote)* **Electrochemical and Microstructural Studies of Degradation Mechanisms in Solid Oxide Cells** – S. A. Barnett (Northwestern University)
- 11:00 1718 **Interface and Grain Boundary Degradation of Cathode from Commercial Cells Induced By Electrochemical Operation in Humidified Air** – Y. Chen (National Energy Technology Laboratory, West Virginia University), Y. Fan (National Energy Technology Laboratory), S. Lee (U.S. DOE, National Energy Technology Laboratory), G. A. Hackett, H. Abernathy, K. Gerdes (U.S. DOE National Energy Technology Laboratory), and X. Song (DOE National Energy Technology Laboratory, West Virginia University)
- 11:20 1719 **Degradation of High-Performance Oxygen Electrodes for Solid Oxide Cells** – M. Y. Lu (Northwestern University), S. L. Zhang (Northwestern University, Xi'an Jiaotong University), B. K. Park, Y. A. Chart, and S. A. Barnett (Northwestern University)

- 11:40 1720 **Mitigating Carbon Formation in SOFCs with Aluminum Titanate Doped NiO-YSZ Anodes** – M. Welander and R. A. Walker (Montana State University)
- 12:00 1721 **Life Testing of Ni-YSZ Fuel Electrode Under Electrolysis and Fuel Cell Operation in High Reducing Environment** – Q. Liu, Q. Zhang, P. W. Voorhees, and S. A. Barnett (Northwestern University)

Solid Oxide Cells 3 - Nanoparticles and Secondary Phases – 14:00 – 15:40

Chair(s): Scott A Barnett and Wilson K. S. Chiu

- 14:00 1722 **(Invited) Heterogeneous Doping, a Novel in-Situ Synthesis of Supported Metal Nanocatalysts** – W. Jung (KAIST)
- 14:40 1723 **(Invited) Enhancing High Temperature Electrode Performance with Secondary Phases** – M. Welander, J. B. Sinrud, B. D. Gold, D. R. Driscoll, M. D. McIntyre, M. S. Zachariasen, S. Sofie, and R. A. Walker (Montana State University)
- 15:20 1724 **Effect of Nanoparticle Impregnation on Ni-YSZ Cermet Electrode Polarization Using YSZ-Supported Cells** – B. Mo, P. J. Gasper, Y. Lu, S. N. Basu, U. B. Pal, and S. Gopalan (Boston University)

Solid Oxide Cells 4 - Atomic Layer Deposition – 16:00 – 17:20

Chair(s): Robert A Walker and Deryn Chu

- 16:00 1725 **(Invited) Enhancing SOFC Anode Stability through Atomic Layer Deposition** – S. McIntosh (Lehigh University), R. J. Gorte, J. M. Vohs (University of Pennsylvania), and C. Curran (Lehigh University)
- 16:40 1726 **Effects of Atomic Layer Deposition of ZrO₂ on Infiltrated Mixed Ionic and Electronic Conducting Solid Oxide Cell Electrodes** – T. A. Schmauss and S. A. Barnett (Northwestern University)
- 17:00 1727 **Atomic Layer Deposition to Design Internal Surface of Porous Electrode for Accelerating Charge and Mass Transfer in Fuel Cells** – Y. Chen (West Virginia University), K. Gerdes (U.S. DOE National Energy Technology Laboratory), and X. Song (West Virginia University)

Solid Oxide Cells 5 – 17:20 – 18:20

Chair(s): WooChul Jung and Robert A Walker

- 17:20 1728 **(Invited) Ionic Conducting Ceramic Membranes – Potential Applications - Materials - Components – Transport in Asymmetric Structures** – W. A. Meulenber (Forschungszentrum Jülich GmbH - IEK-1), S. Baumann (Forschungszentrum Jülich GmbH, IEK-1), F. Schulze-Küppers (Forschungszentrum Jülich GmbH - IEK-1), W. Deibert (Forschungszentrum Jülich GmbH, IEK-1), and O. Guillon (Jülich Aachen Research Alliance, JARA-Energy, Forschungszentrum Jülich GmbH, IEK-1)

- 18:00 1729 **Modeling Thermochemical Energy Storage and Release in Redox Cycles of Ca_{1-x}Sr_xMnO_{3-Δ}** – L. Imponenti (Colorado School of Mines), R. J. Braun (Mechanical Eng. Dept., Colorado School of Mines), and G. S. Jackson (Colorado School of Mines)

106

An Invited Symposium on Advances and Perspectives on Modern Polymer Electrolyte Fuel Cells – In Honor of Shimshon Gottesfeld

Energy Technology / Industrial Electrochemistry and Electrochemical Engineering / Physical and Analytical Electrochemistry

Houston Ballroom C, Dallas Sheraton Convention Center

Electrochemistry/Electrocatalysis 1 – 08:00 – 12:00

Chair(s): Masahiro Watanabe and Rod L. Borup

- 08:00 1796 **(Invited) Stepping in the Dark - Active Site Density and Turn over Frequency in PGM-Free Metal-Nitrogen Doped Carbon (M-N-C) ORR Fuel Cell Electrocatalysts** – P. Strasser (Technical University Berlin)
- 08:30 1797 **(Invited) Catalysts for Fuel Cells** – P. P. Lopes (Argonne National Laboratory), D. Strmcnik, R. Wang, H. Lv, N. Becknell, N. M. Markovic, and V. Stamenkovic (Argonne National Laboratory)
- 08:55 1798 **(Invited) Highly Active and Robust Pt-Skin/Pt Alloy Two-Way Catalysts for Oxygen Reduction and Hydrogen Oxidation in PEFCs** – H. Uchida (Clean Energy Research Center, University of Yamanashi, Fuel Cell Nanomaterials Center, University of Yamanashi), G. Shi, S. Kobayashi (Clean Energy Research Center, University of Yamanashi), H. Yano (Fuel Cell Nanomaterials Center, University of Yamanashi), J. Inukai (Clean Energy Research Center, University of Yamanashi), D. A. Tryk, and A. Iiyama (Fuel Cell Nanomaterials Center, University of Yamanashi)
- 09:15 1799 **(Invited) Challenges and Opportunities in Developing Anode Catalysts for Direct Ethanol and Ammonia Fuel Cells** – J. X. Wang (Chemistry Department, Brookhaven National Laboratory)
- 09:35 1800 **(Invited) Electrocatalysis from First-Principles: Reaction Mechanisms and Ideas for Improved Materials** – M. Mavrikakis, A. O. Elnabawy, and J. A. Herron (University of Wisconsin - Madison)
- 10:00 **Break**

10:20 **1801** *(Invited)* Hierarchical “Core-Shell” Low-Loading Pt Electrocatalysts for the Oxygen Reduction Reaction Based on a Graphene “Core” and a Carbon Nitride “Shell” – V. Di Noto (Dept. of Industrial Engineering, University of Padova, INSTM), E. Negro (Dept. of Industrial Engineering, University of Padova, Centro Studi “Giorgio Levi Cases”), A. Nale, Y. Bang (Dept. of Industrial Engineering, University of Padova), K. Vezzù (Dept. of Industrial Engineering, University of Padova, CMBM, University of Padova), G. Pagot (Dept. of Industrial Engineering, University of Padova, Centro Studi “Giorgio Levi Cases”), and G. Pace (CNR-ICMATE)

10:45 **1802** *(Invited)* Polymer Hydrogel-Derived Carbon Supports for Highly Stable Pt/C Cathode Catalysts in PEM Fuel Cells – Z. Qiao (University at Buffalo, SUNY), D. Li (Los Alamos National Lab), J. S. Spendelow (Los Alamos National Laboratory), and G. Wu (University at Buffalo, the State University of New York)

11:05 **1803** *(Invited)* Precious Metal-Free Electrocatalysis: Accomplishments and Challenges – P. Zelenay (Los Alamos National Laboratory)

11:30 **1804** *(Invited)* Shape-Controlled Multimetallic Nanoparticle Electrocatalysts – B. Roldan Cuenya (Fritz Haber Institute of the Max Planck Society)

Electrochemistry/Electrocatalysis 2 – 13:40 – 17:20

Chair(s): Piotr Zelenay, Huyen N Dinh and Gang Wu

13:40 **1805** *(Invited)* Fundamental Studies of PEM Fuel Cell Catalyst Layer Architectures – R. L. Borup, A. M. Baker, N. Macauley, K. Chintam, D. Richard, D. A. Langlois, and R. Mukundan (Los Alamos National Laboratory)

14:00 **1806** *(Invited)* Recent Progress in PEFC Technology and Future Direction – Y. Kamitaka, A. Shinohara, T. Suzuki (Toyota Central R&D Labs., Inc.), H. Yamada (Toyota Central R&D Labs., Inc.), K. Kodama, R. Jinnouchi, and Y. Morimoto (Toyota Central R&D Labs., Inc.)

14:25 **1807** *(Invited)* Fuel Cells Fueled By Sustainable Liquid Fuels – G. L. Soloveichik (Advanced Research Projects Agency-Energy (ARPA-E))

14:45 **1808** *(Invited)* Self-Supported Nanoporous Carbon Scaffold As a Novel Material for Use in Fuel Cells and Electrolysis Cells – M. Atwa (Department of Chemistry, University of Calgary, Department of Chemistry, Suez Canal University), X. Li (Department of Chemistry, University of Calgary), E. Bertin, J. Parnian, X. Tong, J. Li, and V. I. Birss (Department of Chemistry, University of Calgary)

15:10 **1809** *(Invited)* Polymer Electrolyte Fuel Cell Catalysis - Older Goodies and New Concepts – T. J. Schmidt (ETH Zürich)

15:35 **1810** *(Invited)* Insights from the inside: Imaging Water in the Porous Structures of Fuel Cells – F. N. Büchi, J. Eller, H. Xu (Electrochemistry Laboratory, Paul Scherrer Institut), and P. Boillat (ECL and LNS Laboratories, Paul Scherrer Institut)

16:00 **Break**

16:20 **1811** *(Invited)* Progress Towards High Power Density and Durable PEFCs with PGM-Free Cathodes – M. A. Uddin, L. Langhorst (Carnegie Mellon University), H. Zhang (University at Buffalo, the State University of New York), Y. Guo, X. Xu, D. Beltran (Carnegie Mellon University), G. Wu (University at Buffalo, the State University of New York), and S. Litster (Carnegie Mellon University)

16:40 **1812** *(Invited)* Rechargeable-Liquid Fuel Cells and Hydrogen Carriers: Recent Progress and Key Challenges – M. L. Perry (United Technologies Research Center)

17:00 **1813** *(Invited)* Translating Knowledge from PEM and AEM Fuel Cells to Biofuel Cells and Hybrid Fuel Cells – S. D. Minteer (University of Utah)

Energy Technology Division Research Award Address – 17:20 – 18:00
Chair(s): Andrew M. Herring

17:20 **1814** *(Energy Technology Division Research Award Address)* Transition Metal-Nitrogen-Carbon Catalysts for Oxygen Reduction Reaction: Surface Chemistry, Morphology and Reactivity – P. Atanassov (University of California, Irvine)

K02

Electron-Transfer Activation in Organic and Biological Systems

Organic and Biological Electrochemistry / Energy Technology / Physical and Analytical Electrochemistry / Sensor
Pearl 3, Dallas Sheraton Hotel

Electron-Transfer Activation in Organic and Biological Systems - Session 1 – 08:00 – 11:40

Chair(s): Graham T. Cheek and Dennis G Peters

08:00 **1857** Electrochemical Reduction of Chlorpyrifos at Silver Cathodes in Dimethylformamide – E. C. R. McKenzie and D. G. Peters (Indiana University)

08:20 **1858** Electrochemical Reduction of Acetochlor at Carbon and Silver Cathodes in Dimethylformamide – A. G. Couto Petro and D. G. Peters (Indiana University)

08:40 **1859** Electrochemical Investigation of Halogenated Hydroxybenzonnitriles at Silver Cathodes in Dimethylformamide – T. J. Nugen, E. C. R. McKenzie, and D. G. Peters (Indiana University)

09:00 **1860** The Role of H-Bonding in PCET: The Chemically Reversible One Electron, Three Acid Reduction of N-Methyl-4,4'-Bipyridine Radical in Acetonitrile – D. K. Smith, K. Pavlova, A. Medina, M. Rivera, and N. T. Smith (San Diego State University)

09:20 **1861** The Role of H-Bonding in Non-Concerted Proton-Coupled Electron Transfer: Explaining the Voltammetry of Phenylendiamines in the Presence of Weak Bases in Acetonitrile – L. A. Clare (San Diego State University), T. D. Pham, L. Rafou, A. Buenaventura, V. Mikhaylova, and D. K. Smith (San Diego State University)

- 09:40 **Break**
- 10:00 **1862** **Electrochemical Studies of Amino Acid: Metal Ion Interactions** – P. O. Choi, D. C. Clark, and G. T. Cheek (United States Naval Academy)
- 10:20 **1863** **Photoelectrosynthesis of 2,5-Furandicarboxylic Acid (FDCA) and Impact of Band-Gap on Conversion Yield** – S. Hosseini and D. G. Peters (Indiana University)
- 10:40 **1864** **Visible Light-Driven Cross Coupling Reactions Catalyzed By B₁₂ Complex with Photosensitizer** – H. Shimakoshi, L. Chen, Y. Hisaeda, and Y. Anai (Kyushu University)
- 11:00 **1865** **Ethanol Production from *Saccharum Spontanum* Biomass Native to Nepal Using Bioelectrochemical Cell** – J. Joshi (CDBT, Tribhuvan University)
- 11:20 **1866** **Use of Imidoxyl Radical Mediators for Electrochemical Oxidation/Depolymerization of Lignin** – M. Rafiee (University of Wisconsin-Madison) and S. S. Stahl (University of Wisconsin - Madison)

Electron-Transfer Activation in Organic and Biological Systems - Session 2 – 14:00 – 15:00

Chair(s): Diane K Smith and Graham T. Cheek

- 14:00 **1867** **NADPH As a Sole Reducing Agent for Silver Nanoparticle Formation - TEM and Electrochemical Insight at the Ensemble and Single Entity Level** – S. Hietzschold, A. Walter, C. Davis, A. Taylor, and L. Sepunaru (University of California, Santa Barbara)
- 14:20 **1868** **Bioelectrochemistry of Human Liver Microsomes Attached to Magnetic Nanoparticles** – S. Krishnan, R. Nerimetla, G. Premaratne (Oklahoma State University), and H. Liu (Beijing Normal University)
- 14:40 **1869** **Electrochemical Behaviors of Some Metallic Materials during Biofilm Formations in LB Liquid Culture with *Escherichia coli*** – H. Kanematsu (National Institute of Technology Suzuka College), A. Tazaki, R. Itoh (National Institute of Technology, Suzuka College), H. Yamada (National Institute of Technology, Nara College), D. M. Barry (Clarkson University, SUNNY CANTON), N. Hirai, A. Ogawa, T. Kogo, D. Kuroda (National Institute of Technology Suzuka College), K. Tsunashima (National Institute of Technology Wakayama College), and K. Katakura (National Institute of Technology, Nara College)

Lone Star B/C, Dallas Sheraton Convention Center

K02 Poster Session – 18:00 – 20:00

- **1870** **The Study of Electron Transfer at the Interface of Cytochromes and Iron Oxide Minerals** – H. Wang, A. Johs, J. F. Browning, L. Liang, and A. Tennant (Oak Ridge National Lab)
- **1871** **Mechanistic Insight into Photoelectrochemical Conversion of Alkyl Monohalides to Aldehydes** – R. Lee, S. Hosseini, and D. G. Peters (Indiana University)

L01 Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry General Session and Grahame Award Symposium

Physical and Analytical Electrochemistry
Trinity 3, Dallas Sheraton Hotel

Physical and Analytical Electrochemistry Division David C. Grahame Award Address – 08:25 – 12:10

Chair(s): Alice H. Suroviec

- 08:25 **Introductory Remarks**
- 08:30 **1901** **(Physical and Analytical Electrochemistry Division David C. Grahame Award Address) Electroanalytical Techniques for Studying Nitrogenase Enzyme Mechanisms** – S. D. Minteer (University of Utah)
- 09:05 **1902** **(Invited) Brief Historical Overview and Current Status of Electrochemical Neurotransmitter Detection** – A. Shadlaghani, M. Farzaneh, D. Kinser, and R. C. Reid (University of North Texas)
- 09:30 **Break**
- 09:40 **1903** **(Invited) Engineering of Enzymatic Bioelectrochemical Interface for *In Vivo* Analysis** – F. Wu and L. Mao (University of the Chinese Academy of Sciences)
- 10:05 **1904** **(Invited) Redox Active Metallic and Glyco-Based Nanoparticles for Enzymatic Bioelectrocatalysis** – X. Chen, J. L. Hammond, A. J. Gross, F. Giroud, R. Borsali, and S. Cosnier (Grenoble Alpes University)
- 10:30 **1905** **(Invited) Confocal Raman Microscopy in the Study of Membrane Materials for Energy Conversion** – C. Korzeniewski (Texas Tech University), R. Cai, J. Kitt (University of Utah), Y. Liang (Texas Tech University), S. D. Minteer, and J. M. Harris (University of Utah)
- 10:55 **1906** **(Invited) Current Understanding and Future Aspects of Direct Electron Transfer Mechanism of Fad Dependent Glucose Dehydrogenase Complex** – K. Sode (The University of North Carolina at Chapel Hill, North Carolina State University)
- 11:20 **1907** **(Invited) 13 Vitamins on a Potential Axis** – M. D. Lovander, D. L. Parr IV, B. Parke, J. Lyon, and J. Leddy (University of Iowa)
- 11:45 **1908** **(Invited) High-Precision Analyses of True Single-Molecule Chemistry using Nanopore Methods** – H. Ren (Miami University), C. G. Cheyne, A. M. Fleming, C. J. Burrows, M. A. Edwards, and H. S. White (University of Utah)

Lone Star B/C, Dallas Sheraton Convention Center

L01 Poster Session – 18:00 – 20:00

- **1909** **Photoelectrochemical Biosensing** – J. Tang (Stanford University)
- **1910** **Epitaxial Growth of Iron Tungstate Nanosheets on One-Dimensional Photoanodes for Efficient Solar Water Oxidation** – H. Lin (The Hong Kong University of Science and Technology) and S. Yang (Peking University Shenzhen Graduate School, The Hong Kong University of Science and Technology)

- **1911 Heavy Metals Extaction and Separation By Electrodeposition on a STEEL Substrate from Wastewater** – Y. Addi (USTHB-ENPEI)
- **1912 Hot Holes Assist Plasmonic Nanoelectrode Dissolution** – A. Al-Zubeidi, B. S. Hoener, S. S. E. Collins, W. Wang, S. Kirchner, S. A. Hosseini Jebeli, A. Joplin (Rice University), W. S. Chang (University of Massachusetts Dartmouth, Rice University), S. Link, and C. F. Landes (Rice University)
- **1913 Fabrication of Piezoelectric Platforms for Studying Strain in Electrocatalysis** – M. J. Counihan (University of Illinois at Urbana-Champaign), B. H. Simpson (University of Illinois at Urbana-Champaign, California Institute of Technology), and J. Rodriguez-Lopez (University of Illinois at Urbana-Champaign)
- **1914 Study of the Electrochemical Mechanism of Dyes in Ionic Liquid By NIR Spectroelectrochemistry** – P. Fanjul (Metrohm), D. Ibáñez, A. Junquera-Pérez, M. B. González-García, and D. Hernández-Santos (Metrohm DropSens)

- 16:20 **1935 Direct Electron Transfer Type Faradaic Enzyme EIS** – J. Okuda-Shimazaki (The University of North Carolina at Chapel Hill, North Carolina State University), Y. Ito (Tokyo University of Agriculture and Technology), N. Loew (The University of North Carolina at Chapel Hill, North Carolina State University), W. Tsugawa (Tokyo University of Agriculture and Technology), and K. Sode (The University of North Carolina at Chapel Hill, North Carolina State University)
- 16:40 **1936 On the Electrochemical Impedance Spectroscopy of Marcus-Hush-Chidsey Heterogeneous Kinetics** – K. B. Knudsen (Department of Chemical Engineering, UC Berkeley, Energy Storage and Distributed Resources Division, LBNL) and B. D. McCloskey (Energy Storage and Distributed Resources Division, LBNL, Department of Chemical Engineering, UC Berkeley)
- 17:00 **1937 Pyeis: A Python-Based Electrochemical Impedance Spectroscopy Analyzer and Simulator** – K. B. Knudsen (Department of Chemical Engineering, UC Berkeley, Lawrence Berkeley National Laboratory)
- 17:20 **1938 Potential-Dependent Double Layer Capacitance at Room Temperature Ionic Liquids - Carbon Electrode Interfaces Studied By Electrochemical Impedance Spectroscopy** – G. M. Swain and K. Bhardwaj (Michigan State University)
- 17:40 **1939 MS and EIS Characterization of Electrolessly Deposited Composite Metals on Carbon Fiber Surfaces** – R. Nelson (Florida A&M University - Florida State University), V. G. Watson, D. Kannan, M. Weetom (FAMU-FSU College of Engineering), M. H. Weatherspoon (Florida A&M University - Florida State University), and E. E. Kalu (Florida A&M University - Florida State University COE)

Lone Star B/C, Dallas Sheraton Convention Center

L02 Poster Session – 18:00 – 20:00

- **1940 SLOCK™- Sleep Sock for Tracking Chronobiology** – S. Upasham (University of Texas, Dallas) and S. Prasad (The University of Texas at Dallas)
- **1941 Characterization of Surface and Bulk Properties of an Electrochemical Biosensor for Reliable Detection of Inflammatory Biomarkers** – B. Jagannath (The University of Texas at Dallas), S. Muthukumar (Enlisen LLC), and S. Prasad (University of Texas at Dallas)

L02 Impedance Technologies, Diagnostics, and Sensing Applications 5

Physical and Analytical Electrochemistry
Trinity 3, Dallas Sheraton Hotel

Impedance Technologies, Diagnostics, and Sensing Applications 5 – 14:05 – 18:00

Chair(s): Petr Vanýsek and Andrew Campion Hillier

- 14:05 **Introductory Remarks**
- 14:10 **1930 Flexible Impedimetric Sensors for Detection of Pollutants** – L. Stanciu, S. Diaz, L. K. Lin, and A. M. Ulloa-Gomez (Purdue University)
- 14:30 **1931 An Electrochemical Impedance Spectroscopy Study of Hydroxide Ion Conduction in Polymer Electrolytes** – J. Li and K. Lian (University of Toronto)
- 14:50 **1932 Disentangling Thermodynamic and Kinetic Effects at Photoelectrochemical Interfaces Via Intensity-Modulated High-Frequency Resistivity (IMHFR)** – R. T. Pekarek, S. Christensen (National Renewable Energy Lab), J. Liu (National Renewable Energy Laboratory), and N. Neale (National Renewable Energy Lab)
- 15:10 **1933 Electrical Impedance Spectroscopy and Its Application in the Study of Electrochemical Sensors** – P. Vanýsek (Brno University of Technology, Northern Illinois University), J. Hovancová (University of P. J. Šafárik in Košice), and R. Oriňáková (Pavol Jozef Šafárik University)
- 15:30 **Break**
- 16:00 **1934 Four Probe Impedance and Transference Number Analysis on Polymer Electrolytes in Liquid Phase** – L. Y. Su (Chemical Engineering, National Taiwan University) and N. L. Wu (National Taiwan University)

Computational Electrochemistry 5

Physical and Analytical Electrochemistry / Energy Technology / Industrial Electrochemistry and Electrochemical Engineering
Trinity 1, Dallas Sheraton Hotel

Ab Initio Molecular Dynamics – 08:00 – 10:00

Chair(s): Stephen J. Paddison

- 08:00 1954 **(Invited) Discovering Design Principles for Anion Exchange Membranes with High Hydroxide Conductivity: An *Ab Initio* Molecular Dynamics Study** – M. E. Tuckerman, T. E. Zelovich, and Z. E. Long (New York University)
- 08:40 1955 **Electrochemical Oxidation of Liquid Ammonia on Pt(100) Electrode: First-Principles Study** – D. Skachkov (University of Florida, Case Western Reserve University) and V. R. Chitturi (Wonik Materials North America LLC)
- 09:00 1956 **The Role of Theory in the Development of Electrocatalysts: Case Study on Pt-Skin/Pt Alloy Nanoparticles for Hydrogen Oxidation and Evolution** – D. A. Tryk (Fuel Cell Nanomaterials Center, University of Yamanashi), G. Shi (Clean Energy Research Center, University of Yamanashi), H. Yano, H. Uchida, and A. Iiyama (Fuel Cell Nanomaterials Center, University of Yamanashi)
- 09:20 1957 **Anion Exchange Membranes with Low Hydration Conditions from an *Ab Initio* Molecular Dynamics Perspective** – T. Zelovich, L. Vogt (New York University), D. R. Dekel (Technion Israel Institute of Technology), M. Hickner (The Pennsylvania State University), C. Bae (Rensselaer Polytechnic Institute), S. J. Paddison (University of Tennessee, Knoxville), and M. E. Tuckerman (New York University)
- 09:40 1958 **Strain-Induced Ionic Conductivity of Cubic $\text{Li}_{6.25}\text{Al}_{0.25}\text{La}_3\text{Zr}_2\text{O}_{12}$ solid Electrolyte** – A. Moradabadi (Technische Universität Darmstadt, Freie Universität Berlin) and P. Kaghazchi (Forschungszentrum Jülich, Institute of Energy Research)

DFT – 10:20 – 12:20

Chair(s): Iryna V. Zenyuk and Stephen J. Paddison

- 10:20 1959 **(Invited) The Electronic Structure Underlying Electrochemistry of Two-Dimensional Materials** – Y. Liu (The University of Texas at Austin)
- 11:00 1960 **Single Mo Atom Supported on N-Doped Black Phosphorus As an Efficient Electrocatalyst for Nitrogen Fixation at Ambient Conditions** – P. Ou and J. Song (McGill University)
- 11:20 1961 **Characterization of Lithium Peroxide Growth Mechanisms at Li-O_2 Battery Discharge Conditions Using *Ab Initio* Computations** – J. B. Haskins (NASA Ames Research Center), H. Pham (Lawrence Berkeley National Laboratory), and J. W. Lawson (NASA Ames Research Center)

- 11:40 1962 **Formation of Small Polaron and Polaronic Charge Transfer within BiVO_4 Photocatalyst** – H. P. Sarker and M. N. Huda (University of Texas at Arlington)
- 12:00 1963 **Electron Density Topological Analysis of Adsorbates on Pt and Pt Alloy Fuel Cell Catalytic Layers** – E. S. Smotkin (Northeastern University) and N. Dimakis (University of Texas Rio Grande Valley)

Continuum Modeling – 14:00 – 15:40

Chair(s): Scott Calabrese Barton and Stephen J. Paddison

- 14:00 1964 **(Invited) Mechanical Forces Around the Diffuse Double Layer** – C. W. Monroe (Department of Engineering Science, University of Oxford)
- 14:40 1965 **CO Site Preference on Copper Surfaces in Electrochemical Environments: Deciphering Voltage and Electrolyte Composition Effects** – S. E. Weitzner, S. A. Akhade, J. B. Varley, B. C. Wood, S. E. Baker, and E. B. Duoss (Lawrence Livermore National Laboratory)
- 15:00 1966 **Electrostatics to Electrodynamics Via an Additional Frame of Reference** – G. Kennell and R. Evitts (University of Saskatchewan)
- 15:20 1967 **Capacitive Deionization Systems for Water Desalination Applications: Role of the Electrosorption Resistance and Non-Electrostatic Binding in the Porous Electrodes** – Y. Salamat and C. H. Hidrovo (Northeastern University)

Polyoxometallates and Nanostructured Metal Oxides in Efficient Electrocatalysis, Energy Conversion, and Charge Storage

Physical and Analytical Electrochemistry / Energy Technology
Trinity 2, Dallas Sheraton Hotel

Polyoxometallates and Nanostructured Metal Oxides in Efficient Electrocatalysis, Energy Conversion, and Charge Storage 3 – 08:00 – 09:30

Chair(s): Vito Di Noto and Ronny Neumann

- 08:00 1974 **(Keynote) The Use of Polyoxometallates in Proton Conducting Membranes for Electrochemical Energy Conversion** – A. M. Herring and M. C. Kuo (Colorado School of Mines)
- 08:40 1975 **(Invited) Nanofibrous Doped Tin Oxide As Electrocatalyst Support for PEM Fuel Cells and Electrolysers** – S. Cavaliere, I. Jiménez-Morales, F. Haidar, D. J. Jones, and J. Rozière (CNRS - ICGM - AIME - University of Montpellier)
- 09:10 1976 **Preparation of Carbon Metal Oxide Composites for Hybrid Supercapacitor Applications** – S. Malekpour, K. J. Balkus Jr. (The University of Texas at Dallas), and J. P. Ferraris (University of Texas at Dallas)

Polyoxometallates and Nanostructured Metal Oxides in Efficient Electrocatalysis, Energy Conversion, and Charge Storage 4 – 10:00 – 11:50
Chair(s): Jose Ramon Galan-Mascaros, Pawel J. Kulesza and Iwona Agnieszka Rutkowska

- 10:00 1977 **(Keynote) Tuning the Activity and Selectivity of CO₂ Electroreduction Catalysts through Nanostructuring and Controlled Oxidation** – B. Roldan Cuenya (Fritz Haber Institute of the Max Planck Society)
- 10:40 1978 **(Keynote) Electroreduction of CO₂ on Pb and Bi Nanoneedles** – D. Guay (EMT-INRS), M. Fan, S. Garbarino, A. C. Tavares (INRS-EMT), S. Prabhudev, and G. A. Botton (McMaster University)
- 11:20 1979 **(Invited) Photo-Electrode Hybrid Materials Based on Metal-Oxide and Pi-Conjugated Units for Solar-Energy Conversion Devices** – M. P. Santoni, M. Jouini, A. Delices, Z. Xu, C. Z. Dong, S. Belynyck (Université Paris Diderot - Sorbonne Paris Cité), I. A. Rutkowska, and P. J. Kulesza (University of Warsaw)

Polyoxometallates and Nanostructured Metal Oxides in Efficient Electrocatalysis, Energy Conversion, and Charge Storage 5 – 14:00 – 15:30
Chair(s): Beatriz Roldan Cuenya and Frederic Maillard

- 14:00 1980 **(Keynote) Perovskite Lanthanum Titanium Oxides for Solar Water Splitting** – N. Wu (West Virginia University)
- 14:40 1981 **(Invited) Charge Carriers Behaviour in Solar Energy Harvesting & Converting Semiconducting Systems.** – K. Bienkowski (University of Warsaw), M. Jadwyszczak, A. Dubiel (University of Warsaw), M. Arasimowicz, and R. Solarska (University of Warsaw)
- 15:10 1982 **Purely Protonic Solar Cells Fabricated from Photoacid-Modified Ion-Exchange Membranes** – L. Schulte and S. Ardo (University of California, Irvine)

Polyoxometallates and Nanostructured Metal Oxides in Efficient Electrocatalysis, Energy Conversion, and Charge Storage 6 – 16:00 – 17:30
Chair(s): Renata Anna Solarska and Daniel Guay

- 16:00 1983 **(Keynote) Use of Conducting Metal Oxides to Modulate Charge Density Gradients in Ionic Liquids** – K. Ma, R. Jarosova, G. M. Swain, and G. J. Blanchard (Michigan State University)
- 16:40 1984 **(Invited) Oxygen Evolution and Reduction on La_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_{3-Δ} Perovskites with Tunable Structural Features** – A. C. Tavares (INRS - Énergie, Matériaux et Télécommunications), F. Deganello (CNR – Istituto per lo Studio dei Materiali Nanostrutturati), J. G. Rivera (CIDETEQ - Queretaro), J. Valdez (INRS - Énergie, Matériaux et Télécommunications), G. Orozco Gamboa (CIDETEQ - Queretaro), and A. Yurtsever (INRS - Énergie, Matériaux et Télécommunications)

- 17:10 1985 **Nano Architected Binder-Free Metal Oxide Electrodes for High Voltage Supercapacitor** – K. Sambath Kumar (Department of Materials Science and Engineering, UCF, Nanoscience Technology Center, UCF), J. Cherusseri (Nanoscience Technology Center, UCF), and J. Thomas (CREOL, College of Optics and Photonics, UCF, NanoScience Technology Center, UCF)

Lone Star B/C, Dallas Sheraton Convention Center

L04 Poster Session – 18:00 – 20:00

Chair(s): Pawel J. Kulesza, Iwona Agnieszka Rutkowska and Vito Di Noto

- 1986 **Chemically Regenerative Redox Fuel Cell As Alternative to Conventional Proton Exchange Membrane Fuel Cell** – P. Y. Blanchard, N. Donzel, M. Dupont, J. Rozière, and D. J. Jones (CNRS - ICGM - AIME - University of Montpellier)
- 1987 **Exploring Catalytic Traits of so₄²⁻-Functionalized Iron Oxides Exploited to Decompose Aqueous Recalcitrant Pollutants** – J. Kim, Y. J. Choe, and S. H. Kim (Korea Institute of Science and Technology)
- 1988 **Construction of Dawson-Type Molybdovanadophosphoric Acid-Based Electrochemical Sensor and Its Application in Sensing Folic Acid** – H. Xu and M. Zhang (Harbin Engineering University)



Sensors, Actuators, and Microsystems General Session

Sensor
Trinity 5, Dallas Sheraton Hotel

Nanosensors – 08:00 – 12:00

Chair(s): Jessica E. Koehne and Larry A. Nagahara

- 08:00 2004 **Nanocrystalline Electro-Chemo-Mechanical Actuator Operating at Room Temperature** – E. Makagon, E. Mishuk, S. Cohen, E. Wachtel, and I. Lubomirsky (Weizmann Institute of Science)
- 08:20 2005 **(Invited) Sensing, Measuring and Imaging Surface Charge with Nanoscale Pipettes** – L. A. Baker (Department of Chemistry, Indiana University)
- 09:00 2006 **Cobalt Containing Zeolitic Imidazolate Framework Incorporated Electrospun Carbon Nanofibers As Free-Standing Film Sensor for Electrochemical Detection of Hydrogen Peroxide** – M. A. Riaz and Y. Chen (The University of Sydney)
- 09:20 2007 **Halides Perovskite Piezoelectric Nanogenerators As ElectroSkin for Electromechanical Energy Harvesting and Physiological Monitoring** – D. B. Kim and Y. S. Cho (Yonsei University)
- 09:40 2008 **Nanoarray Device for Detection of Gas Phase I₂** – K. C. Klavetter (Sandia National Laboratories), J. J. Coleman (Sandia National Labs), C. R. Perez, and M. P. Siegal (Sandia National Laboratories)

- 10:00 **Break**
- 10:20 **2009 Functional Iron Oxide (Fe₂O₃) Nanoparticles Based Gas Sensor Operating at High Temperature** – Y. C. Huang, S. C. Liao, R. W. Chuang (National Cheng Kung University), and T. J. Hsueh (National Kaohsiung University of Science and Technology)
- 10:40 **2010 New Electrochemical Sensor for Hg(II) Trace Detection in Natural Waters: Electrode Functionalization with Gold Nanoparticles and Diazonium Salts** – F. Fezai, P. Gros, M. Meireles, and D. Evrard (Laboratoire de Génie Chimique)
- 11:00 **2011 Characterization of Arsenic Adsorption on Metal Oxide Nanoparticles By Nanoimpact Electrochemistry** – F. Hosseini Narouei (Clarkson university), S. Andreescu, and D. Andreescu (Clarkson University)
- 11:20 **2012 Electrochemical Detection of Dissolved Hydrogen Sulfide By Platinum-Modified Multi-Walled Carbon Nanotubes Sensors** – S. Mohajeri, A. Dolati, and S. Salmani Rezaie (Sharif University of Technology)

IoT Sensors – 14:00 – 17:00

Chair(s): Bryan A. Chin and Larry A. Nagahara

- 14:00 **2013 Embedded Ceramic-Based Passive Wireless Sensors for Harsh-Environment Applications** – K. Sivaneri Varadharajan Idhaiaam (West Virginia University), E. M. Sabolsky (West Virginia University, U.S. DOE, National Energy Technology Laboratory), K. Sabolsky, L. Redinger, H. Palakurthi (West Virginia University), D. S. Reynolds (WVU - Computer Science and Electrical Engineering), and K. Sierros (West Virginia University)
- 14:20 **2014 Millimetre-Wave Bow-Tie Reconfigurable Antenna for 5G Applications** – T. K. Saha, M. A. Riheen, and P. K. Sekhar (Washington State University Vancouver)
- 14:40 **2015 Development of a Wireless Surface Acoustic Wave Methane Sensor Using a Metal-Organic Framework As a Sensing Layer for Natural Gas Pipelines** – J. Devkota (National Energy Technology Laboratory, AECOM Pittsburgh), T. Hong (National Energy Technology Laboratory), J. Culp (National Energy Technology Laboratory, AECOM Pittsburgh), and P. R. Ohodnicki Jr. (National Energy Technology Laboratory)
- 15:00 **2016 Distributed Fiber Optic pH Sensor for the Application in the Wellbore** – F. Lu (National Energy Technology Laboratory, ORISE), R. F. Wright, P. Lu (National Energy Technology Laboratory, AECOM), and P. R. Ohodnicki Jr. (National Energy Technology Laboratory, Carnegie Mellon University)
- 15:20 **2017 Optical Fiber-Based Corrosion Sensor with Fe/SiO₂ Coating** – R. F. Wright, P. Lu (National Energy Technology Laboratory, AECOM), M. Ziomek-Moroz (DOE/NETL), and P. R. Ohodnicki Jr. (National Energy Technology Laboratory, Carnegie Mellon University)

- 15:40 **2018 Advanced Electrochemical Sensors for Monitoring Relative Humidity and Internal Corrosion Rates of Natural Gas Transmission Pipelines Containing H₂S** – M. Ziomek-Moroz (DOE/NETL), T. Duffy, D. M. Hall, and S. N. Lvov (The Pennsylvania State University)
- 16:00 **Break**
- 16:20 **2019 Ultrathin Hydrophobic Uhmwpe Membrane for Moisture Sensing and Removal through Water Confinement Effect** – Q. GU, L. Xie (HongKong University of Science and Technology), J. Li (The Hong Kong University of Science and Technology), X. Huang (HongKong University of Science and Technology), and P. Gao (The Hong Kong University of Science and Technology)
- 16:40 **2020 Inkjet Printing on PET Substrate: Printing Properties Investigation and Performance Analysis** – M. A. Riheen, T. K. Saha (Washington State University Vancouver), and P. K. Sekhar (Washington State University, Vancouver)

M03 Sensors for Precision Medicine

Sensor

Trinity 4, Dallas Sheraton Hotel

Sensors for Precision Medicine - Session 1 – 08:00 – 12:40

Chair(s): Praveen K. Sekhar and Jessica E. Koehne

- 08:00 **2069 (Invited) Multifunctional Nanoplatfoms for Biomedical Applications** – D. Ma (Institut national de la recherche scientifique (INRS))
- 08:40 **2070 A Carbon Nanotube-Based Impedimetric Biosensor for Detection of Micro-RNA** – H. Asadi and R. P. Ramasamy (University of Georgia)
- 09:00 **2071 (Invited) Nanozyme Integrated Microfluidic Devices for Smart Health Monitoring** – C. Z. Li (Florida International University), C. Zhang (Shannxi Normal University), and T. Lin (Florida International University)
- 09:40 **Break**
- 10:00 **2072 (Invited) Multifunctional Surface-Enhanced Raman Spectroscopy (SERS) Probes for Targeted Detection of Cancer Cells** – M. Li (Central South University)
- 10:40 **2073 Microfluidic Chemotaxis Assay through Stable Chemical Gradient** – C. S. Lee (Chungnam National University)
- 11:00 **2074 (Invited) Nano Composite Platforms: Synthesis and Biological Applications Including Cancer Diagnosis** – M. Packirisamy (Concordia University)
- 11:40 **2075 Development in Two-Dimensional Nanomaterials for Wearable Health Monitoring Systems** – E. Lee, A. VahidMohammadi, D. Lee, J. Yoon, M. Beidaghi (Auburn University), Y. S. Yoon (Gachon University), and D. J. Kim (Materials Research and Education Center)
- 12:00 **2076 (Invited) Towards New Near-Infrared Triggered Theranostic Nanoplatfoms** – F. Vetrone (INRS-EMT, Université du Québec)

Sensors for Precision Medicine - Session 2 – 14:00 – 17:40

Chair(s): Dong-Joo Kim and Nianqiang (Nick) Wu

- 14:00 2077 **(Invited) Substrate-Directed Electrocrystallization As a Manufacturing Method for Nanowire Sensors** – G. Mao, M. Kilani, and X. Yu (Wayne State University)
- 14:40 2078 **Advancing Electrochemical Microsensor Technologies Using Carbon Nanomaterials for Chronic Dopamine Detection** – A. Y. Chang, G. Dutta, S. Siddiqui, and P. U. Arumugam (Louisiana Tech University)
- 15:00 2079 **(Invited) Diffusion Map Analysis of Physiological Signals** – T. Nakamura and S. Hagan (British Columbia Institute of Technology)
- 15:40 **Break**
- 16:00 2080 **(Invited) Electrochemically Tunable Sensors for Passive Sweat Analytics and Its Applications for Wearable Technologies** – S. Prasad (University of Texas at Dallas), S. Muthukumar (EnLiSense LLC), D. Kinnamon (University of Texas, Dallas), R. D. Munje (The University of Texas at Dallas), S. Upasham, and K. C. Lin (University of Texas, Dallas)
- 16:40 2081 **Sensing Platform for Antiviral Drug in Pharmaceuticals and Human Physiology Exploiting Electrocatalytic Properties of Carbon Nanomaterials** – P. Tarlekar and S. Chatterjee (Institute of Chemical Technology)
- 17:00 2082 **(Invited) Modularized Inexpensive Detection of Biomarkers for Medical Applications** – P. H. Carey IV, J. Yang, C. W. Chang, F. Ren, S. J. Pearton (University of Florida), S. Y. Lu (National Chiao Tung University), J. Lin (University of Florida), Y. T. Liao (National Chiao Tung University), B. Lobo, M. Gebhard, and M. E. Leon (University of Florida)

701 General Student Poster Session

All Divisions

Lone Star B/C, Dallas Sheraton Convention Center

701 General Student Poster Session – 18:00 – 20:00

- 2126 **A Flexible Al//Fe(III) and Aqds-Doped PANI Air Battery with Capacity Self-Restoring Performance** – H. Cao Jr., S. Si (Central South University), X. Xu, and J. Li (Hunan Chemical Vocational Technology)
- 2127 **Study on the Stability of Sulfide Solid-State Electrolyte Based upon Electronic Structure Calculated from First Principles Calculation** – H. Kim, T. Hwang, M. Cho (Seoul National University), and K. Cho (The University of Texas at Dallas)
- 2128 **Understanding of Correlation between Li Diffusion and Local Environments in Solid Electrolyte Based on Kinetic Energy Barriers As Local Structure Variations By First Principles Calculation** – T. Hwang, H. Kim, M. Cho (Seoul National University), and K. Cho (The University of Texas at Dallas)

- 2129 **Fabrication of Flexible Energy Storage Device Using MnO₂@Graphene Composite Synthesised By Electrochemical Exfoliation Method** – H. T. Das (Pondicherry University)
- 2130 **Facile Mn Surface Doping of Ni-Rich Layered Cathode Materials for Lithium Ion Batteries** – J. H. Kim (Kyunghee University), W. Cho (Korea Electronics Technology Institute), and M. S. Park (Kyunghee University)
- 2131 **Tailoring Microstructures and Ionic Conductivities of Li_{1-x}Al_xGe_{2-x}(PO₄)₃ (LAGP) Solid Electrolytes for All-Solid-State Batteries** – Y. C. Kim (Kyung Hee University), M. S. Park (Kyunghee University), and K. N. Jung (Korea Institute of Energy Research)
- 2132 **Study on the Structural and Surface Changes during Lithiation/Delithiation Processes in Copper Sulfide** – J. S. Nam, J. H. Lee, S. M. Hwang, and Y. J. Kim (SKKU Advanced Institute of Nanotechnology (SAINT))
- 2133 **CO₂-Derived Manganese-Oxide Carbon Composites As Electrode Materials for Fuel Cells and Supercapacitors** – J. H. Park, W. Y. Choi (KAIST), Y. Kim (LG Chem), and J. W. Lee (KAIST)
- 2134 **Advanced Porous Membranes with Slit-like Selective Layer for Flow Battery** – L. Qiao, H. Zhang, W. Lu, C. Xiao, Q. Fu, X. Li (Dalian Institute of Chemical Physics), and I. F. J. Vankelecom (Katholieke Universiteit Leuven)
- 2135 **Vertically Aligned Laminate Porous Electrode: Amaze the Performance with a Maze Structure** – X. Li (Dalian Institute of Chemical Physics), H. Zhang Sr. (Dalian Institute of Chemical Physics, CAS), and Y. Yu (Dalian Institute of Chemical Physics)
- 2136 **Additive-Mediated Electrode-Electrolyte Interphase for Long Service-Life, High-Nickel Cathodes for Lithium-Ion Batteries** – J. Li and A. Manthiram (The University of Texas at Austin)
- 2137 **Rational Design of a Dual-Function Hybrid Cathode Substrate for Lithium-Sulfur Batteries** – L. Luo and A. Manthiram (The University of Texas at Austin)
- 2138 **Effect of the Cooling Process on the Structure and Charge/Discharge Cycling Performance of Li₂MnO₃-LiNi_{0.5}Mn_{0.5}O₂-LiNi_{1/3}Co_{1/3}Mn_{1/3}O₂ Li-Rich Solid-Solution Layered Oxide Cathode Materials for Li-Ion Battery** – F. Nomura, T. Gunji, T. Ohsaka, and F. Matsumoto (Kanagawa University)
- 2139 **Improvement of High-Rate Discharging Performance of LiFePO₄ Cathodes By Forming Micrometer-Sized through-Holed Electrode Structures with a Pico-Second Pulsed Laser** – T. Tsuda, T. Gunji, N. Ando, T. Tanabe (Kanagawa University), S. Nakamura (National Institute of Technology Nagaoka College), N. Soma (Wired Co., Ltd), N. Hayashi (Industrial Research Institute of Niigata Prefecture), T. Ohsaka, and F. Matsumoto (Kanagawa University)

- 2140 **Improvement of High-Rate Performance of LiFePO₄ Cathode with through-Holed LiFePO₄/Activated Carbon Hybrid Electrode Structure Fabricated with a Pico-Second Pulsed Laser** – T. Watanabe, T. Tsuda, T. Gunji, N. Ando, T. Tanabe (Kanagawa University), S. Nakamura (National Institute of Technology Nagaoka College), N. Soma (Wired Co., Ltd), N. Hayashi (Industrial Research Institute of Niigata Prefecture), T. Ohsaka, and F. Matsumoto (Kanagawa University)
- 2141 **Understanding How Structure Influences Electrochemical Behavior When ZnO Is Used to Suppress Aluminum Corrosion in Alkaline Electrolytes** – E. Faegh, S. Shrestha, X. Zhao, and W. E. Mustain (University of South Carolina)
- 2142 **Understanding SEI Formation on Conversion-Based Metal Oxide Anodes** – B. Ng and W. E. Mustain (University of South Carolina)
- 2143 **Performance of Lead Acid Battery Using Graphite Based Composite As Cathode Current Collector** – Y. Nakamura, T. Ohkubo, H. Okano (National Institute of Technology, Kagawa College), T. Inoue, T. Hosokawa, A. Takeda (Toyo Tanso Co., Ltd.), T. Iwai, T. Yabutsuka, S. Takai (Graduate School of Energy Science, Kyoto University), and T. Yao (National Institute of Technology, Kagawa College)
- 2144 **The Development of Redox-Active Helical Polypeptides for Battery Application** – T. Nguyen, A. D. Easley, C. H. Yu, J. Fan, R. Letteri, X. He, L. Su, J. L. Lutkenhaus, and K. Wooley (Texas A&M University)
- 2145 **Potential Dependences of Discharge Characteristics of Li-O₂ Batteries with Various Electrolytes** – K. Nishioka, K. Morimoto, T. Kusumoto (Graduate School of Engineering Science, Osaka University), J. Seki, Y. Hase (Toyota Central R&D Labs., Inc.), and S. Nakanishi (Graduate School of Engineering Science, Osaka University, Research Center for Solar Energy Chemistry)
- 2146 **Self-Recovery of Capacity in Lithium Metal Hybrid Lithium Ion Battery** – R. Pathak, K. Chen, Y. Zhou, and Q. Qiao (South Dakota State University)
- 2147 **Nanostructured Nickel Hydroxide Cathodes for Energy Dense, Safe, Aqueous Rechargeable Nickel-Zinc Batteries** – S. W. Kimmel (Texas State University, U.S. Naval Research Laboratory), J. S. Ko (Former NRL/NRC Postdoctoral Associate, U.S. Naval Research Laboratory), J. W. Long (U.S. Naval Research Laboratory), J. F. Parker (U.S. Naval Research Laboratory, Surface Chemistry Branch (Code 6170)), D. R. Rolison (Surface Chemistry Branch (Code 6170), U.S. Naval Research Laboratory), and C. P. Rhodes (Texas State University)
- 2148 **Ultrasmall NiMoO₄ Nanoparticle Embedded on Carbon Matrix for High Performance Asymmetric Supercapacitors** – G. P. Sharma, R. G. Pala (Indian Institute of Technology Kanpur), and S. Sivakumar (Indian Institute of Technology at Kanpur)
- 2149 **Cathode Properties of Na₃FePO₄CO₃ Prepared By Mechanical Milling Method for Na-Ion Battery** – B. W. Xie (IGSES, Kyushu University), S. Okada (IMCE, Kyushu University), A. Kitajou (ORI, Yamaguchi University), Y. Fujita, N. Oka, T. Nishida (Kindai University), W. Kobayashi, and T. Takahara (Tosoh Corporation)
- 2150 **Promoting the Cyclic Performance and Boosting Li⁺transport of LiV₃O₈ Via Ca Doping** – Y. Xu (China University of Geosciences (Wuhan))
- 2151 **Oxidation Kinetics of Electrospun Compatibilized Immiscible PBI:6FDD Polymer Blends** – J. P. Ferraris (University of Texas at Dallas), K. J. Balkus Jr. (The University of Texas at Dallas), and S. D. Panangala (University of Texas at Dallas)
- 2152 **Hierarchical Porous Carbons Synthesized By CO₂ Conversion with CaCO₃ Nano-Template** – J. H. Park, Y. K. Kim, and J. W. Lee (KAIST)
- 2153 **Carbon-Electrode Dielectrophoresis to Identify *Candida* strains** – E. Barnett, M. Vogel, C. Hammond, C. Bisbee, P. Jones, D. M. Keck, and R. Martinez-Duarte (Clemson University)
- 2154 **Bimetallic–Organic Framework-Derived Hierarchically Porous Co-Zn-N-C As Efficient Catalyst for Acidic Oxygen Reduction Reaction** – Z. Meng (Wuhan University of Technology)
- 2155 **Investigation of Solvent Effects on Electrochemical Quartz Crystal Microbalance (eQCM) Studies of Carbon Nanomaterials** – R. A. Quinlan, A. R. Carrion, R. A. Outlaw, and D. Premathilake (Christopher Newport University)
- 2156 **Exploring the Synergy between Nanoparticles and Passivation Film Chemistry Relevant to Cu Chemical Mechanical Planarization (CMP) Slurry Formulation** – C. F. Graverson, A. M. Mikos, M. G. Salinas, M. Hill (Lewis University, Department of Chemistry), A. Mlynarski (Lewis University), and J. J. Keleher (Lewis University, Department of Chemistry)
- 2157 **Corrosion Behavior of Fe-Cr-Al Alloy for Anode Current Collector in Oxygen Atmosphere** – H. Y. Woo, S. C. Kwon, and J. H. Lee (Chungnam National University)
- 2158 **Corrosion Behaviour of FeCrAl Alloy for Anode Current Collector in Hot Liquid Silver** – G. S. Lim (Chungnam National University, Republic of Korea), S. H. Cho (Rapidly Solidified Materials Research Center), S. C. Kwon, and J. H. Lee (Chungnam National University, Republic of Korea)
- 2159 **Passivation and Depassivation Behavior of Zinc in Concrete** – M. Maeda, A. Ooi, E. Tada, and A. Nishikata (Tokyo Institute of Technology)
- 2160 **Electrical Characterizations of Amorphous Silicon Carbide** – N. Geramifard, A. Joshi-Imre, and S. F. Cogan (The University of Texas at Dallas)

- 2161 **Role of Additive Structure on Controlling Ceria/Substrate Interactions Relevant to Shallow Trench Isolation (STI) Chemical Mechanical Planarization (CMP)** – K. M. Wortman-Otto, C. Saucedo, and J. J. Keleher (Lewis University, Department of Chemistry)
- 2162 **Probing the Effect of Point of Use Filtration on Cu CMP Slurry Health** – M. G. Salinas, T. B. Zubi, and J. J. Keleher (Lewis University, Department of Chemistry)
- 2163 **Enhancing Post-Chemical Mechanical Planarization (CMP) Cleaning in the Presence of Polyelectrolyte-Based Chemistry Relevant to Shallow Trench Isolation** – A. M. Mikos, C. F. Graverson, T. B. Zubi, and J. J. Keleher (Lewis University, Department of Chemistry)
- 2164 **Crystallization of Atomic Layer Deposited MgO Thin Films as a Buffer Layer for Rocksalt Beo Film Growth** – H. Lee, B. Wang, and C. S. Hwang (Seoul National University)
- 2165 **Investigation on Electrical Properties of Hydrogen Doped Sputtered Boron Carbon Nitride Thin Films** – S. D. Nehate (University of Central Florida) and K. B. Sundaram (Univ. of Central Florida)
- 2166 **Spectroscopic Investigation of Complex Redox Equilibria in Cupric Chloride Subtractive Etching for Cu High Density Interconnects** – G. Issac, A. Lambert, J. Caperton, A. Salunke, L. Lu, and O. Chyan (University of North Texas)
- 2167 **An Investigation of the Role of Rapid Chlorine Hydrolysis on the Performance of Electrochemically-Mediated Desalination** – C. D. Davies, S. Johnson, and R. M. Crooks (The University of Texas at Austin)
- 2168 **Eco-Friendly Electroreduction of Indium Tin Oxide Using SOM Anode in Molten Salts** – S. C. Kwon and J. H. Lee (Chungnam National University)
- 2169 **Characterization of CaZrO₃ Coating Layer Formed on YSZ Plate for SOM Anode in CaCl₂-CaF₂-CaO Electrolyte** – W. B. Kim (Chungnam National University, Republic of Korea), H. Nersisyan (Rapidly Solidified Materials Research Center), S. C. Kwon (Chungnam National University, Republic of Korea), B. U. Yoo (Korea Institute of Materials Science), and J. H. Lee (Chungnam National University, Republic of Korea)
- 2170 **Developing of Novel Electrorefining Process of Titanium from Cuti Alloy in K-Free Molten Salt** – V. E. Ri (Chungnam National University), Y. J. Lee (Ziron Tech), B. U. Yoo (Korea Institute of Materials Science), H. Nersisyan (Rapidly Solidified Materials Research Center), and J. H. Lee (Chungnam National University, Republic of Korea)
- 2171 **Scale Formation on Na₄Mn₉O₁₈ Insertion Electrodes in Electrochemical Deionization** – Y. Zhang (Carnegie Mellon University), S. Shanbhag, M. Mauter, and J. Whitacre (Carnegie Mellon University)
- 2172 **Effect of Brightener Concentration on Recrystallization Process of Electroplated Cu** – C. H. Yang, Y. W. Lee, C. Y. Lee, Y. H. Huang, and C. E. Ho (Yuan Ze University)
- 2173 **Pulsed Electrodeposition of Si Under Light Illumination in Ionic Liquid** – S. Watanuki (Waseda University), Y. Fukunaka (Nanotechnology Research Institute, Waseda), and T. Homma (Res. Org. for Nano&Life Innovation, Waseda University)
- 2174 **Synthesis of Cobalt Selenide Thin Films and Their Electrocatalytic Properties in Water Splitting Process** – A. M. Kwiecińska, D. Kutyla, K. Koleczyk, K. Skibinska, P. Zabinski, and R. Kowalik (AGH University of Science and Technology)
- 2175 **A Study on the Decontamination Possibility of Simulated Radioactive Inconel 600 – Co Alloy Using Electrorefining in LiCl-KCl Electrolyte** – W. S. Choi (Chungnam National University), Y. J. Lee (Ziron Tech), S. H. Lee (Chungnam National University), and J. H. Lee (Chungnam National University, Republic of Korea)
- 2176 **Non-Volatile, Multi-Level Optical Information Storage of Block Copolymer Structural Color** – H. Eoh, H. S. Kang, T. H. Park, K. L. Kim, H. Lee, and C. Park (Dept of Materials Science Engineering, Yonsei University)
- 2177 **Fabrication of Localized Silicon-on-Insulator Based Rhombus-Shaped Channels in Silicon** – M. Ogini, M. Voyantzis, P. K. Koech, A. Alice Francis, S. Mohan, M. Deo, and S. Albin (Department of Engineering, Norfolk State University)
- 2178 **Fabrication of Silicon Quantum Dots from Silicon Nanowires by a Combined Process of Chemical Etching and Ultrasonication** – A. Alice Francis, S. Mohan, P. K. Koech, M. E. Ogini, M. Deo, and S. Albin (Department of Engineering, Norfolk State University)
- 2179 **Characteristics of Al_xGa_{1-x}n/GaN Grown on Sapphire Substrates with Different AlN Layers Inserted** – K. Bun (The University of Cambodia)
- 2180 **Growth of High-Quality GaN Films on Multi-AlN/Sapphire Templates By MOCVD** – K. Bun (The University of Cambodia)
- 2181 **Room Temperature Atomic Layer Deposition of ZnO Observed By in Situ IR Absorption Spectroscopy** – K. Yoshida, K. Saito, M. Miura, K. Kanomata (Yamagata University), and F. Hirose (CREST, JST, Yamagata University)
- 2182 **High-Temperature Stability of YSZ/Msz Membrane in Molten Salts** – H. Ryu and J. H. Lee (Chungnam National University, Republic of Korea)
- 2183 **Ultrasonication Assisted Production of Silicon Nanoparticles from Nanowires** – S. Mohan, A. Alice Francis, P. K. Koech, M. E. Ogini, M. Deo, and S. Albin (Department of Engineering, Norfolk State University)

- **2184 Epitaxial Grown Ferroelectric Polymers on Graphene Layer for Non-Volatile Transistor Memory with Graphene Channel** – K. L. Kim and C. Park (Dept of Materials Science Engineering, Yonsei University)
- **2185 Annealing Studies of RF Sputtered CuGaO₂ Thin Films** – A. K. Saikumar (University Of Central Florida) and K. B. Sundaram (Univ. of Central Florida)
- **2186 Optical Studies of RF Sputtered CuInO₂ Thin Films** – G. Skaria (University of Central Florida), A. K. Saikumar (University Of Central Florida), S. D. Nehate (University of Central Florida), and K. B. Sundaram (Univ. of Central Florida)
- **2187 Thermal Management of Dynamic Operation of Solid Oxide Cell-Based Energy Storage System for 2 Renewable Electricity Scenarios** – P. Mottaghizadeh (University of California, Irvine, National Fuel Cell Research Center), M. Fardadi (University of California, Los Angeles), F. Jabbari (University of California, Irvine), and J. Brouwer (National Fuel Cell Research Center, University of California, Irvine)
- **2188 Study on the Stability and Durability of Dual Metal-Doped TiO₂ Catalyst Support for Pt** – M. F. M. Labata (University of California Merced) and P. Y. A. Chuang (University of California, Merced)
- **2189 Rheological Study of Micro Porous Layer and Its Effect on Transport Properties in a PEMFC** – S. Mehrazi (University of California Merced) and P. Y. A. Chuang (University of California, Merced)
- **2190 Analytical Modeling of Two-Phase Water Transport in a PEMFC** – M. A. Rahman, F. Mojica, and P. Y. A. Chuang (University of California, Merced)
- **2191 Study of Transport Behavior in an Anion Exchange Membrane Fuel Cell** – M. Sarker, F. Mojica, and P. Y. A. Chuang (University of California, Merced)
- **2192 Rheological Study of Electrode Ink for a PEMFC: I/C and Solid Content** – D. Yang and P. Y. A. Chuang (University of California, Merced)
- **2193 Study of Channel-Induced Convective Mass Transport in a PEMFC Using Limiting Current Method** – F. Mojica, M. Sarker, M. A. Rahman, and P. Y. A. Chuang (University of California, Merced)
- **2194 Development of a Conductive Biomimetic Nanocomposite Anode for Improved Microbial Fuel Cell Efficiency** – A. D. Dunne, M. D. Puckett, N. E. Yuede, and J. J. Keleher (Lewis University, Department of Chemistry)
- **2195 Thermal Stability and Cyclic Sealing Performance of Glass Composite Seals** – T. Kim, S. Park, and J. C. Lee (Myongji University)
- **2196 Structural and Electronic Assessment of Heterogeneous PANI@UiO-66 Composite Photoelectrode Material** – J. J. Shanahan, D. S. Kissel (Lewis University, Department of Chemistry), and E. Sullivan (Illinois State University)
- **2197 Flue Gas Derived Carbon Electrocatalysts for Enhancing Oxygen Reduction Reaction** – J. H. Park, S. Baik, and J. W. Lee (KAIST)
- **2198 Two-Dimensional CoS_x/SnS_x Chalcogenides Layered Ultrathin Nanosheets for Electrocatalytic Hydrogen Evolution** – D. H. Kim, S. S. Shinde, and J. H. Lee (Hanyang University)
- **2199 Morphology-Controlled Pt Alloy Nanoparticles for Oxygen Reduction Reaction** – T. Nakamoto (Tohoku University), R. Seki (Panasonic Corporation), S. Yokoyama (Tohoku University), S. Tsuchida (Panasonic Corporation), H. Takahashi, and K. Tohji (Tohoku University)
- **2200 Efficient and Inexpensive All-Iron Alkaline Water Electrolyzer** – D. Mitra, B. Zayat, and S. R. Narayanan (University of Southern California)
- **2201 Investigation of Activation Process of Membrane Electrode Assembly Obtained By Various Formulation Conditions for High-Temperature Polymer Electrolyte Fuel Cell** – D. H. Kim, E. A. Lee, and C. Pak (Gwangju Institute of Science and Technology)
- **2202 Failure Mechanism of PEM Fuel Cell after a Durability Testing of 1000 h Under High Back Pressures** – C. Cai, Y. Rao, S. Li, and M. Pan (Hubei Key Laboratory of Fuel Cell, Wuhan university of technology)
- **2203 Electrodeposited Co-Mo-TiO₂ Electrocatalysts for the Hydrogen Evolution Reaction (HER)** – C. Wang and E. J. Podlaha (Clarkson University)
- **2204 High Surface Area Reverse Electroactuation Energy Harvesting** – P. R. Adhikari (University of North Texas) and R. C. Reid (University of Utah)
- **2205 Preparation of Freeze-Casted Tubular SOFC with a Modified Anode Functional Layer** – B. Emley and Y. Yao (University of Houston)
- **2206 Characterizing the Performance of Biologically Templated Membrane Electrode Assemblies for Low-Loaded Electrodes in Proton Exchange Membrane (PEM) Electrolyzers** – C. Kim, N. Pramounmat, and J. N. Renner (Case Western Reserve University)
- **2207 Design of a Bimetallic Electrode (Ag-Cu) for Electrochemical Reduction of Carbon Dioxide (CO₂) to Value-Added Chemical Products.** – E. M. Reyes Pérez, R. Natividad Rangel, G. Roa Morales (Universidad Autónoma del Estado de México), and M. T. Ramírez Silva (Universidad Autónoma Metropolitana)
- **2208 Nanostructured Carbon-Free Tantalum Oxide-Supported Platinum for Highly Active and Stable Acidic Oxygen Reduction Electrocatalysts** – C. P. Rhodes and L. S. Aguirre (Texas State University)
- **2209 Hydrogen Isotope Effects during Water Electrolysis Using Liquid and Polymer Membrane Electrolytes** – L. M. S. Silva (Clemson University)

- 2210 **Single-Atoms As the Active Site with High Selectivity for Electrochemical Application** – H. Xu, T. Xu (Northern Illinois University), and D. J. Liu (Argonne National Laboratory)
- 2211 **Ultrasonic Spray Pyrolysis Deposition of NiO Thin Film for Efficient Perovskite Solar Cell** – C. HU (Hong Kong University of Science and Technology) and S. Yang (Peking University Shenzhen Graduate School)
- 2212 **Highly Stable Silver Nanowires Based Bilayered Flexible Transparent Conductive Electrode** – M. A. Shinde (Yeungnam University), M. Koduru, M. Rakibuddin (Yeungnam university), and H. Kim (Yeungnam University)
- 2213 **Design of Enzyme-Based Biosensors for Monitoring Pollutants in Gold Mining Environments** – A. A. Adio-Adepoju (University of Lagos, Lagos, Nigeria, Robert Gordon University, Aberdeen, UK), W. Okiei (University of Lagos, Lagos, Nigeria), C. Fernandez (Robert Gordon University, Aberdeen, UK), I. Akinbulu, G. Ibrahim, and B. Ojobe (University of Lagos, Lagos, Nigeria)
- 2214 **Perturbation of Ureidopyrimidinone Polymerization Via Electrochemical Redox Reactions of Electro-Active Ureidopyrimidinones** – M. Cedano and D. K. Smith (San Diego State University)
- 2215 **Time-Resolved Single-Cell Lysis Kinetics of Metal Nanoparticle-Infused Biopolymer Matrices** – D. M. Danhausen, T. J. Beckmann, and J. J. Keleher (Lewis University, Department of Chemistry)
- 2216 **Novel Synthesis of [2,3] Naphthaloporphyrrins** – S. Kumar (University Of North Texas), W. Webre, C. Stewart, F. D'Souza (University of North Texas), and H. Wang (Univeristy of North Texas)
- 2217 **Using Electron-Transfer-Induced Proton Transfer to Control Binding Strength in H-Bond Dimers** – H. Choi and D. K. Smith (San Diego State University)
- 2218 **Electrochemically-Controlled Dimerization in Ferrocene Ureidopyrimidinone Derivatives. the Effect of Ferrocene Position** – V. Mikhaylova and D. K. Smith (San Diego State University)
- 2219 **The Role of H-Bonding in Proton-Coupled Electron Transfer: The Reduction of N-Methyl-4,4'-Bipyridine Radical in Acetonitrile in the Presence of Acidic Alcohols** – K. Pavlova and D. K. Smith (San Diego State University)
- 2220 **Use of a Redox-Responsive 4 H-Bond Ureidopyrimidinone (UPy) Array to Control Polymerization in a Upy-Based Supramolecular Polymer** – K. Vuong, M. Cedano, and L. A. Clare (San Diego State University)
- 2221 **Photoelectrochemical Pyramid Texturization of n-Type Ge (100) Probed By Integrated Electrochemical Chamber/X-Ray Photoelectron Spectroscopy** – G. H. A. Abrenica (KU Leuven, imec), M. V. Lebedev (Ioffe Institute), H. Le (IMEC), A. Hajduk (TU Darmstadt), M. Fingerle (Darmstadt University of Technology), T. Mayer (Darmstadt University of Technology, Germany), S. De Gendt (KU Leuven, imec), and D. H. van Dorp (IMEC)
- 2222 **Development of Adsorptive Membrane for Removal and Reclamation of Chromium from Tannery Wastewater** – F. S. Hussain (NCE in Analytical Chemistry, University of Sindh Jamshoro)
- 2223 **Removal of Adsorbed CO on Pt Electrode By Reaction with Alcohols** – K. Iida and Y. Mukouyama (Tokyo Denki University)
- 2224 **Uio-Type Metal-Organic Framework Thin Film with Redox-Active Linkers: Development and Charge Transport Behavior** – B. A. Johnson (Uppsala University), A. Bhunia (National Institute of Technology Puducherry), H. Fei (Tongji University), S. M. Cohen (University of California, San Diego), and S. Ott (Uppsala University)
- 2225 **Development of a Photocatalytic Cellulose Nanocomposite Media for Organic Pollutant Degradation** – S. J. Baker, J. L. Tabert, and J. J. Keleher (Lewis University, Department of Chemistry)
- 2226 **Continuous Microfluidic Pump Involving Conducting Polymer Modified Redox-Magnetohydrodynamics (R-MHD)** – F. Z. Khan, D. N. Parette, and I. Fritsch (University of Arkansas)
- 2227 **The Development of a Direct Electron Transfer Type Open Circuit Potential Based Glucose Sensor Utilizing Microneedle Type Gold Electrode** – I. Lee (The University of North Carolina at Chapel Hill, Tokyo University of Agriculture and Technology), N. Loew, J. Okuda-Shimazaki (The University of North Carolina at Chapel Hill, North Carolina State University), W. Tsugawa, K. Ikebukuro (Tokyo University of Agriculture and Technology), and K. Sode (The University of North Carolina at Chapel Hill, North Carolina State University)
- 2228 **Electrochemical Transformation of 4-Chlorophenol for the Determination of Chloride in Advanced Oxidation Processes** – M. Molina, G. Roa-Morales, P. Balderas, D. Amado, R. N. Rangel, and C. E. Barrera (Universidad Autónoma del Estado de México, CCIQS UAEM-UNAM)
- 2229 **Electrocatalytic Activities of Gold Nanoparticles on Glassy Carbon Prepared By Simple Electrochemical Method** – H. Okada, Y. Fukuda, Y. Mukouyama (Tokyo Denki University), M. Saito, and T. Nishimura (Osaka Research Institute of Industrial Sci. and Tech.)
- 2230 **Photoelectrochemical Properties of (K, Na) NbO₃ (KNN) Thin Film** – M. Kurohagi, Y. Mukouyama, S. Ishii (Tokyo Denki University), H. Ohsaka, and I. Kanno (Kobe University)

- 2231 **Study of Electrochemical Behavior of Gases in Ionic Liquids** – Y. Zhang (Xi'an University of Architecture and Technology) and J. Xue (Xi'an University of Architecture and Technology)
- 2232 **Conjugation of an α -Helical Peptide to the Surface of Gold Nanoparticles** – L. Wilder, W. Fies, C. Rabin, L. J. Webb (Department of Chemistry - University of Texas at Austin), and R. M. Crooks (The University of Texas at Austin)
- 2233 **Optimization of a Conductive Hydrogel Nanocomposite for Use in Responsive Wound Management Technology** – A. N. Linhart, H. R. Lange (Lewis University, Department of Chemistry), W. E. Chura (Lewis University, Department of Biology), and J. J. Keleher (Lewis University, Department of Chemistry)
- 2234 **Modeling Fermi Levels in Metal Functionalized TiO₂ Sensors for Applications in Volatile Organic Biomarker Detection** – L. McKinnon, Y. Saffary, S. Mohanty, and K. Prisbrey (University of Utah)
- 2235 **Liquid-Phase Exfoliation of Transition Metal Dichalcogenide Nanosheets with Zwitterionic Detergents and Their Inkjet-Printed Photodetectors** – H. Lee, H. Eoh, K. L. Kim, and C. Park (Dept of Materials Science Engineering, Yonsei University)
- 2236 **Electrochemical Detection of Endocrine Disruptor (Bisphenol Compounds) in the Consumer Applications** – R. Tom (Navajo Technical University), A. M. Varman (Arizona State University), and T. Soundappan (Navajo Technical University)
- 2237 **Utilization of Highly Purified Single Wall Carbon Nanotubes Dispersed in Polymer Thin Films for an Improved Performance of an Electrochemical Glucose Sensor** – P. P. Tumkur, V. Goornavar, and G. T. Ramesh (Norfolk State University)
- 2238 **Improved Gas-Phase Detection of Volatile Organic Compounds Using a Solid-State Conductive Polymer Electrolyte** – C. N. Willis, Y. Saffary, M. Misra, S. K. Mohanty, and A. Tripathy (University of Utah)

WEDNESDAY, MAY 29

Highlights

- 1200h..... Energy Technology Division Graduate Student Award Address sponsored by Bio-Logic – *City View 8, Sheraton Hotel*
- 1400h..... Industrial Electrochemistry and Electrochemical Engineering Division Student Achievement Award Address – *Pearl 5, Sheraton Hotel*
- 1400h..... Technical Exhibit opens, ECS Career Expo and Resume Review – *Lone Star B/C, Sheraton Convention Center*
- 1530h..... Networking Break – *Lone Star B/C, Sheraton Convention Center*
- 1800h..... Technical Exhibit, and General Poster Session – *Lone Star B/C, Sheraton Convention Center*

A01

Battery and Energy Technology Joint General Session

Energy Technology / Battery

Houston Ballroom A, Dallas Sheraton Convention Center

Electrolytes – 08:00 – 10:00

Chair(s): Mariappan Parans Paranthaman and Jie Xiao

- 08:00 **69** **Highly Concentrated Aqueous Gel Electrolytes for Diverse Battery Applications** – A. V. Cresce (U.S. Army Research Laboratory), N. T. Eidson (US Army Research Laboratory), and K. C. Xu (U.S. Army Research Laboratory)
- 08:20 **70** **Layered Ionic Conductor Na₂Zn₂TeO₆: Crystal Structure and Stacking Faults** – X. Li, F. Bianchini, J. Wind, P. Vajeeston (University of Oslo), D. Wragg, and H. Fjellvåg (University of Oslo, Dept. of Chemistry and SMN)
- 08:40 **71** **Freeze Tape Casting Derived Li₇La₃Zr₂O₁₂ Electrolyte Architecture with Oriented Ion Conduction Channels** – E. Yi (Lawrence Berkeley National Laboratory), H. Shen (Lawrence Berkeley National Laboratory, Xi'an Jiaotong University), S. Sofie (Montana State University), G. Chen, and M. Doeff (Lawrence Berkeley National Laboratory)
- 09:00 **72** **Evaluation of Polymeric Binders in Aqueous Electrolyte Environment** – G. T. Pace and W. Wu (Aquion Energy)
- 09:20 **73** **A High-Performance Polymer Electrolyte Membrane Enhanced By Graphene Oxide Doped By Redox Species** – X. Zhou, Z. Yan, Y. Wang, C. Zhang, X. Qiao (University of Miami), A. N. Mansour, G. H. Waller (Naval Surface Warfare Center, Carderock Division), C. Martin (Navy Surface Warfare Center at Carderock), and Z. Du (Oak Ridge National Laboratory)

Wednesday, May 29

09:40 74 **Fundamental Investigation of $AlCl_3$ -Amide Electrolyte for Application in Aluminum Ion Battery** – M. Malik, K. L. Ng, and G. Azimi (University of Toronto)

Supercapacitor 1 – 10:00 – 12:20

Chair(s): Edward M. Sabolsky and Rahul Singhal

10:00 75 **Realizing an Asymmetric Supercapacitor Employing Carbon Nanotubes Anchored to Mn_3O_4 Cathode and Fe_3O_4 Anode** – A. Kumar, D. Sarkar (Indian Institute of Science), S. Mukherjee (Indian Institute of Science, Bangalore, INDIA), S. Patil (Indian Institute of Science - Bangalore), D. D. Sarma, and A. K. Shukla (Indian Institute of Science)

10:20 76 **Role of Oxygen Vacancy in Copper-Cobalt Spinel Nanostructures for Electrochemical Energy-Storage** – N. C. D. Nath and J. J. Lee (Dongguk University)

10:40 77 **Thickness Effects on Charge and Discharge Characteristics of CeO_x Mim Capacitors** – K. Hisatsune (School of Engineering, Tokyo Institute of Technology), T. Hoshii, I. Muneta, H. Wakabayashi, K. Tsutsui, and K. Kakushima (Tokyo Institute of Technology)

11:00 78 **Elastic Cu@Ppy Sponge for Hybrid Device with Energy Conversion and Storage** – Z. Li (Beijing Institute of Nanoenergy and Nanosystems) and Z. Li (Beijing Institute of Nanoenergy and Nanosystems, CAS)

11:20 79 **Structural and Electrochemical Properties of Ni and Co Doped $LaMnO_3$ Nanocrystalline Powders As an Supercapacitor Electrode** – E. Binici, N. Solak (Istanbul Technical University), U. Unal (Chemistry Department, Koc University, Koc University Surface Science and Technology Center), and C. Yilmaz Akkaya (Koc University Surface Science and Technology Center)

11:40 80 **Synthesis of Nitrogen-Doped Molybdenum Sulphide and Molybdenum Sulphide/Oxide Nanocomposite As Active Materials for Supercapacitor Electrode** – C. K. Kanade, V. K. Kanade (SAINT, Sungkyunkwan University), S. Hong (Mechanical Engineering, Sungkyukwan University), and T. Kim (Mechanical Engineering, Sungkyunkwan University, SAINT, Sungkyunkwan University)

12:00 81 **Electrochemical Analysis of the Printed $NiCo_2O_4$ // Reduced Graphene Oxide Solid-State Hybrid Supercapacitors on Fabric Substrates for Wearable Applications** – P. Sundriyal and S. Bhattacharya (IIT Kanpur)

Supercapacitor 2 – 14:00 – 18:00

Chair(s): Rahul Singhal and Edward M. Sabolsky

14:00 82 **Alkali Metal Chlorides Based Hydrogel As Eco-Friendly Neutral Electrolyte for Bendable Solid-State Capacitor** – H. Li (Beihang University), Z. Li (Beijing Institute of Nanoenergy and Nanosystems, CAS), and Y. Fan (Beihang University)

14:20 83 **Influence of Processing Routes on the Electrochemical Performance of Supercapacitors (EDLCs) Fabricated from Biomass-Derived Activated Carbons** – G. A. Yakaboylu, C. Jiang (West Virginia University), T. Yumak (Sinop University), J. W. Zondlo, J. Wang, and E. M. Sabolsky (West Virginia University)

14:40 84 **Fabrication and Supercapacitive Properties of Thick Nanostructured Anodic Films on 304 Stainless Steel** – Y. Wang (IMS, University of South-Eastern Norway), G. Li (MNSRC, Taiyuan University of Technology), K. Wang (University of Southeast Norway), and X. Chen (IMS, University of South-Eastern Norway,)

15:00 85 **Electrochemical Effects of Annealing Temperature on Anodic 304 Stainless Steels** – Y. Wang (IMS, University of South-Eastern Norway), G. Li (MNSRC, Taiyuan University of Technology), K. Wang (University of Southeast Norway), and X. Chen (IMS, University of South-Eastern Norway,)

15:20 86 **Cell Optimisation of Supercapacitors through the Use of a Quasi-Reference Electrode and Potentiostatic Analysis** – L. Le Fevre (University of Manchester)

15:40 87 **Graphene like Porous Carbon Sheets Derived from Hibiscus Cannabinus As a Versatile Electrochemical Energy Storage Material** – K. Nanaji (ARCI, IIT Madras), U. V. Varadaraju (IIT Madras), S. Anandan, and T. N. Rao (ARCI)

16:00 **Break**

16:20 88 **Porous Carbon Materials with Ultrahigh Surface Area for High Energy Density Supercapacitors and High Power Density Electrochemical Thermocell.** – L. Zhang (Institute of Chemical Materials), R. H. Baughman (Alan G. MacDiarmid NanoTech Institute, UTD), and Y. Chen (College of Chemistry, Nankai University)

16:40 89 **Sputtered Iridium Oxide Microsupercapacitors Operating in Physiological Electrolytes** – J. Maeng, N. Geramifard, B. Chakraborty, and S. F. Cogan (The University of Texas at Dallas)

17:00 90 **Binder Free Synthesis of Sulphur Doped $Co_3V_2O_8$ Nanoarray for Hybrid Asymmetric Supercapacitor Application in Aqueous and Non-Aqueous Medium** – G. P. Sharma, P. K. Gupta, R. G. Pala (Indian Institute of Technology Kanpur), and S. Sivakumar (Indian Institute of Technology at Kanpur)

17:20 91 **Development of a New 3D Hybrid Nanostructured Carbon/ MnO_2 Framework By Automated Spray Coating and Electrodeposition As High Performance Electrode Material for Supercapacitor Applications** – G. Pognon, C. Rogier, and C. Galindo (Thales Research & Technology)

Lithium Ion Anodes 3 – 08:00 – 12:00

Chair(s): Chunmei Ban, Jodie L. Lutkenhaus and Siddarth Patwardhan

- 08:00 295 **The Application of Magnesiothermic Reduction of Silica to Produce Porous Silicon for Lithium Ion Batteries** – J. Entwistle and S. Patwardhan (The University of Sheffield)
- 08:20 296 **Electrochemical Properties of Amorphous Silica As an Anode Material for Li-Ion Batteries** – V. Renman, M. V. Blanco, A. Norberg, and F. Vullum-Bruer (Norwegian University of Science and Technology)
- 08:40 297 **Tunable Syntheses of Advanced Silicon Anodes Using Cyclohexasilane** – R. A. Elgammal (The Coretec Group)
- 09:00 298 **Coconut Sprout-Derived Graphitized Carbon Based Sodium Ion Capacitors** – V. Surendran, A. R. Suviresh, T. V. Vineesh, B. Babu, and M. M. Shajumon (IISER Thiruvananthapuram)
- 09:20 299 **Nanocarbon Composites for Energy Storage Applications** – L. Ci (Shandong University)
- 09:40 **Break**
- 10:00 300 **Silicon Nano Wires Anodes for High-Performance Lithium Ion Batteries** – E. Peled, D. Schneier, F. Patolsky (School of Chemistry, Tel Aviv University), D. Golodnitsky (School of Chemistry, Tel Aviv University, Wolfson Applied Materials Research Center, TAU), S. Menkin, G. Davidi, N. Harpak, E. Mados, and G. Ardel (School of Chemistry, Tel Aviv University)
- 10:20 301 **Tannic Acid As a Binder in Silicon Anodes for Lithium-Ion Batteries** – K. Sarang (Texas A&M University, Chemical Engineering) and J. L. Lutkenhaus (Texas A&M University)
- 10:40 302 **Alleviate Gassing Problem of $\text{Li}_4\text{Ti}_5\text{O}_{12}$ Anode Using Polymeric Artificial Solid-Electrolyte-Interphase** – Y. H. Chang (National Taiwan University), F. M. Wang (National Taiwan University of Science and Technology), H. C. Wu (Industrial Technology Research Institute), and N. L. Wu (National Taiwan University)
- 11:00 303 **Light-Weight and Flexible Carbon Nanotubes (CNT) Tissues As Anode Materials for Flexible Li-Ion Microbatteries** – V. A. Sugiawati (Aix-Marseille University), F. Vacandio (MADIREL), Y. Ein-Eli (Technion - Israel Institute of Technology), and T. Djenizian (Ecole Nationale Supérieure des Mines de Saint-Etienne)
- 11:20 304 **Red Phosphorous-Span Composite Anode through Electrostatic Spray Deposition for High Performance Lithium-Ion Batteries** – A. Rabiei Baboukani, I. Khakpour, E. Adelowo, V. Drozd, and C. Wang (Florida International University)

- 11:40 305 **The Decoupling of Solid-Electrolyte Interphase Formation from the Mechanical Deformation of Silicon Electrodes** – Y. Yin, L. Cao, T. Yoon, K. N. Wood, E. Arca, C. Stetson, C. Xiao, M. Schnabel (National Renewable Energy Laboratory), G. Yang (Oak Ridge National Laboratory), G. Teeter, C. Jiang (National Renewable Energy Laboratory), J. Nanda (Oak Ridge National Laboratory), and C. Ban (National Renewable Energy Laboratory)

Lone Star A1, Dallas Sheraton Convention Center

Lithium Ion Cathodes 1 – 08:00 – 12:20

Chair(s): Yiman Zhang and Xinhua Liang

- 08:00 306 **Surface Modification for Suppressing Interfacial Parasitic Reactions of Nickel-Rich Lithium-Ion Cathode** – J. Cai (University of Arkansas), H. Gao (University of Toronto), G. Xu (Argonne National Laboratory), L. Li, Y. Ren (X-ray Science Division, Argonne National Laboratory), X. Meng (University of Arkansas), K. Amine (Chemical Sciences/Engineering Division, ANL, Stanford University), and Z. Chen (Argonne National Laboratory)
- 08:20 307 **Redox Chemistry in Conventional Layered Lithium Metal Oxide Cathodes** – W. Tong, N. Li, W. Yang, S. Sallis (Lawrence Berkeley National Laboratory), B. D. McCloskey (Energy Storage and Distributed Resources Division, LBNL), and J. K. Papp (University of California, Berkeley)
- 08:40 308 **Cooperating Effects of Conformal Iron Oxide ALD Coating and Post-Annealing on Li-Rich Layered Cathode** – Y. Gao, Z. Shang (Missouri University of Science and Technology), X. He (University of Missouri-Columbia), J. Park, and X. Liang (Missouri University of Science and Technology)
- 09:00 309 **Multi-Textured Structure Cathode Materials to Accommodate the Fast Charging for Lithium Secondary Batteries** – B. C. Min (Dong-A University), S. M. Lee (Korea Electrotechnology Research Institute), and J. S. Kim (Dong-A University)
- 09:20 310 **A Discovery of an Unexpected Metal Dissolution of Thin-Coated Cathode Particles: Its Theoretical and Experimental Explanations** – Y. He (Missouri University of Science and Technology), S. Sarkar (Missouri University of Science and Technology, Rolla), X. Liang, and J. Park (Missouri University of Science and Technology)
- 09:40 **Break**
- 10:00 311 **Taking LCO to the Next Level: Atomic Layer Deposition for Enhanced Performance of Power Electronics Materials** – B. K. Hughes, M. N. Herbert-Walters, J. E. Trevey, and D. M. King (Forge Nano)
- 10:20 312 **Nano-Rod Gradient $\text{Li}[\text{Ni}_0.81\text{Co}_0.06\text{Mn}_0.13]\text{O}_2$: Preserving Cathode Structure for Long-Term Cycling (1000 Cycles) Li-Ion Batteries** – H. Sun (University of Texas at Austin), C. S. Yoon (Hanyang University), A. Heller (The University of Texas at Austin), and C. B. Mullins (University of Texas at Austin)

- 10:40 313 **Recycling Spent Battery Cathode Materials Using Electrochemical Relithiation** – X. Li (National Renewable Energy Laboratory), A. Burrell, and C. Ban (National Renewable Energy Laboratory)
- 11:00 314 **Structural and Electrochemical Characterization of Thin Film Li_2MoO_3 Cathodes** – E. C. Self, Y. Zhang, A. Kercher (Oak Ridge National Laboratory), N. D. Phillip (University of Tennessee), F. M. Delnick, and J. Nanda (Oak Ridge National Laboratory)
- 11:20 315 **A Comparison of Electrode Surface Films Formed with Different Oxide Cathodes for Lithium-Ion Batteries** – E. M. Erickson (The University of Texas at Austin, Bar-Ilan University), W. Li, and A. Manthiram (The University of Texas at Austin)
- 11:40 316 **Structure and Electrochemistry of LiV_3O_8 Thin Film Electrode: Effect of Diffusion Rate and Concentration on Cell Polarization** – Y. Zhang (Oak Ridge National Laboratory), A. C. Marschlok (Brookhaven National Laboratory), K. J. Takeuchi (Stony Brook University), A. Kercher (Oak Ridge National Laboratory), E. S. Takeuchi (Brookhaven National Lab), and N. J. Dudney (Oak Ridge National Laboratory)
- 12:00 317 **Dry Processed Nickel-Rich Layered Transition Metal Oxide Cathode Electrode** – J. Shin (Maxwell Technologies, Inc.), Y. Yudi, P. Magsino, W. Wong (Maxwell Technologies), and H. Duong (Maxwell Technologies, Inc.)
- 15:40 324 **A New Formulation of the Pseudo2D Battery Model Coupling Macroscopic and Microscopic Deformations** – W. Mai, K. Smith, and A. M. Colclasure (National Renewable Energy Laboratory)
- 16:00 325 **Pre-Electrochemical Treatment Effect of Cu Eqcm Electrode on Lithium Electrodeposition/Dissolution Processes** – T. Kondo, K. S. Smaran, A. Ohama, A. Niida, and K. Nishihara (Ochanomizu University)
- 16:20 326 **Graphene Pliable Pockets Remediating Nanocrystalline Metal Anode for All Li-Ion Types Energy Storages Induced By Polymer-Triggered Synthesis Process in an Expeditious, Scalable and Inexpensive Way** – J. H. Won and J. K. Kang (Korea Advanced Institute of Science and Technology)
- 16:40 327 **Morphology Controlled Fabrication of Nanostructured Molybdenum Oxides By Different Mineralizers Via Hydrothermal Synthesis Method** – E. İnel (Istanbul Technical University) and B. D. Karahan (Istanbul Medipol University)
- 17:00 328 **Quantifying Reaction Products of Silicon Monoxide Electrodes during Initial Cycle in Lithium-Ion Batteries** – D. Yu, T. Tan, and P. K. Lee (City University of Hong Kong)
- 17:20 329 **Effect of Different Carbon Precursors on SiO_2/C Anodes for Li-Ion Batteries** – M. V. Blanco (Norwegian University of Science and Technology), V. Renman (Department of Chemistry - Ångström, Uppsala University), and F. Vullum-Bruer (Norwegian University of Science and Technology)
- 17:40 330 **An Investigation of SEI Layer Composition in Presence of Nano-Fillers in Mcmb Electrodes** – S. Ahamad and A. Gupta (Indian Institute of Technology Delhi)

Lone Star A2, Dallas Sheraton Convention Center

Lithium Ion Anodes 4 – 13:40 – 18:00

Chair(s): Toshihiro Kondo and Jae W. Lee

- 13:40 318 **Performance of Si Anodes in Ionic Liquid Electrolytes with Added Carbonates** – D. T. Rogstad, F. Vullum-Bruer, and A. M. Svensson (Norwegian University of Science and Technology)
- 14:00 319 **Dandelion-like Mesoporous SiO_x/C Nanoparticles for High-Capacity and Ultralong Lifespan Lithium-Ion Battery Anode** – Z. Li, H. Zhao, and J. Wang (University of Science and Technology Beijing)
- 14:20 320 **Facile Technique for the Production of Metal Oxide Anodes for Lithium Ion Batteries** – E. İnel (Istanbul Technical University), B. D. Karahan (Istanbul Medipol University), and O. Keles (Istanbul Technical University)
- 14:40 321 **$\text{CoP}_3@$ Ppy Microcubes As Anode for Lithium-Ion Batteries with Improved Cycling and Rate Performance** – Q. Liu (Huazhong University of Science and Technology)
- 15:00 322 **The Critical Size of Sn Nanograins for Achieving High Round-Trip Efficiency of Reversible Conversion Reaction in Lithiated SnO_2 Nanocrystals** – R. Z. Hu (South China University of Technology) and M. Zhu (South China University of Technology, Guangzhou, China)
- 15:20 323 **Visualization of Anti-Pulverization of Nickel Sulfide in Hierarchical Carbons Shells** – J. H. Park and J. W. Lee (KAIST)

Lone Star A1, Dallas Sheraton Convention Center

Lithium Ion Cathodes 2 – 14:00 – 18:20

Chair(s): Leon Shaw, Gary Koenig and Dongchang Chen

- 14:00 331 **Characterization of Chemical and Electrochemical Lithiation/ Delithiation of LiFePO_4** – D. Gupta and G. Koenig (University of Virginia)
- 14:20 332 **Understanding the Effects of Ultra-Thin Al_2O_3 Coatings Prepared By Atomic Layer Deposition on Lithium Ion Battery Cathode Materials** – D. Kang, A. U. Mane, J. W. Elam, E. F. Barry (Argonne National Laboratory), R. Warburton, and J. Greeley (Purdue University)
- 14:40 333 **Binder-Induced Interface Stabilization and Performance Improvement of Nickel-Rich Cathode** – H. Q. Pham (Chungnam National University), H. Y. Lee (Chungnam National University, Republic of Korea), H. M. Jung (Kumoh National Institute of Technology, Republic of Korea), and S. W. Song (Chungnam National University, Republic of Korea)
- 15:00 334 **Atomic Layer Deposition of Nanocomposite Fluoride Coatings for Li-Ion Batteries** – A. U. Mane, D. Choudhury, A. Gutierrez, J. R. Croy (Argonne National Laboratory), and J. W. Elam (Joint Center for Energy Storage Research)

- 15:20 335 **Influence of Binder Coverage on Interfacial Chemistry of Thin Film $\text{LiNi}_{0.6}\text{Mn}_{0.2}\text{Co}_{0.2}\text{O}_2$ Cathodes** – N. D. Phillip (University of Tennessee) and G. M. Veith (Oak Ridge National Laboratory)
- 15:40 336 **Tunable $\text{LiAlO}_2/\text{Al}_2\text{O}_3$ Coating to Improve the Specific Capacity and Cycle Stability of Nano- LiCoO_2** – L. Shaw (Illinois Institute of Technology), M. Ashuri (Wanger Institute for Sustainable Energy Research), Q. He (Wanger Institute for Sustainable Energy Research (WISER)), and J. A. Kaduk (Illinois Institute of Technology)
- 16:00 337 **Fabrication and Characterization of Porous Thin Film Cathodes Prepared By RF Sputtering for Li-Ion Microbatteries** – V. A. Sugiawati (Aix-Marseille University), F. Vacandio (MADIREL), and T. Djenizian (Ecole Nationale Supérieure des Mines de Saint-Etienne)
- 16:20 338 **Performance Studies of $\text{Cu}_x\text{Fe}_{1-x}\text{F}_2$ Conversion Cathode Materials** – J. K. Ko, D. Fuentevilla, G. H. Waller, and A. N. Mansour (Naval Surface Warfare Center, Carderock Division)
- 16:40 339 **Unraveling the Origin of Performance Degradation in High-Capacity Cation-Disordered Oxide Cathodes** – D. Chen and G. Chen (Lawrence Berkeley National Laboratory)
- 17:00 340 **One Dimensional Nanomaterials for Emerging Energy Storage** – L. Mai (Wuhan University of Technology)
- 17:20 341 **Compact Lithium-Ion Battery Electrodes Fabricated with Lightweight Reduced Graphene Oxide-Based Aerogels** – J. P. Pender (The University of Texas at Austin), H. Xiao (The University of Minnesota), Z. Dong, K. A. Cavallaro, J. A. Weeks, A. Heller (The University of Texas at Austin), C. J. Ellison (The University of Minnesota), and C. B. Mullins (University of Texas at Austin)
- 17:40 342 **Low Cost, Scalable Active Material Coating for Higher Energy Density Li-Ion Batteries** – C. M. Lang, P. D. Moran, and J. T. Herb (Physical Sciences Inc.)
- 18:00 343 **Development of Carbon Fiber-Based Electrodes for Lithium-Ion Battery** – Y. H. Liu (National Central University), H. H. Lin (Industrial Technology Research Institute of Taiwan), and C. H. Hsu (National Cheng Kung University)
- 08:20 439 **Spectroscopic Determination of V^{V} Concentration of Vanadium Flow Battery Catholytes** – N. Quill, D. Oboroceanu (Physics Dept., Bernal Institute, University of Limerick), S. P. Albu, C. Lenihan (Department of Physics, University of Limerick), D. N. Buckley, and R. P. Lynch (Physics Dept., Bernal Institute, University of Limerick, Dept. of Chem. Eng., Case Western Reserve University)
- 08:40 440 **Investigation of Faradaic Contributions from Bipolar Plates to Areal Current Density in Vanadium Redox Flow Batteries** – M. Daugherty, D. Aaron, and M. M. Mench (University of Tennessee)
- 09:00 441 **The Effect of Channel Tapering on the Performance of Vanadium Redox Flow Batteries** – P. A. Garcia-Salaberri, C. Moreno-Carrero (University Carlos III of Madrid), T. C. Gokoglan (University of Massachusetts Lowell), M. Vera (University Carlos III of Madrid), and E. Agar (University of Massachusetts Lowell)
- 09:20 442 **A No-Mixing Design of Vanadium Redox Flow Batteries** – B. Liu, R. Zhu, J. Sun, and M. Zheng (Zhejiang University)
- 09:40 443 **Analysis of Flow Field Scale-up, Design Tradeoffs, and Shunt Current in Redox Flow Battery Stacks** – J. Houser, D. Aaron, and M. M. Mench (University of Tennessee)
- 10:00 444 **(Invited) RKP Vanadium Flow Battery and its Application** – X. Ma (Dalian Rongke Power Integration Co., Ltd.), H. Zhang (Dalian Institute of Chemical Physics), X. Xu, S. Jiang, J. Wu, T. Chigan, H. Wang, H. Zhao, and N. Chen (Dalian Rongke Power Integration Co., Ltd.)

Non-Aqueous Systems - Electrolytes/Electrode Materials 1 – 10:40 – 12:40

Chair(s): Shelley D. Minter and Bin Li

- 10:40 445 **(Invited) Understanding Benzothiadiazole Based Anolyte Materials for Nonaqueous Redox Flow Cells** – L. Zhang, J. Zhang (Joint Center for Energy Storage Research (JCESR)), X. Wei (Indiana University-Purdue University Indianapolis), F. R. Brushett (Joint Center for Energy Storage Research, MIT), and I. A. Shkrob (Argonne National Laboratory)
- 11:10 446 **Electrochemical Energy Storage with Mediator-Ion Solid Electrolytes** – X. Yu and A. Manthiram (The University of Texas at Austin)
- 11:30 447 **Development of Redox Flow Battery Based on Lithium Ion Secondary Battery System** – H. Nariyama (Panasonic Corporation), S. Ito (Panasonic Corporation), Y. Okada (Panasonic Corporation), Y. Inatomi, and M. Fujimoto (Panasonic Corporation)
- 11:50 448 **Iron(tris pyridyl-imine) Complexes As Redox Couples for Non-Aqueous Redox Flow Battery Applications** – S. Maurya, N. Smythe, B. L. Davis, G. Andrade, S. Sharma, E. J. Park, J. Gordon, Y. S. Kim, and R. Mukundan (Los Alamos National Laboratory)

A03

Large Scale Energy Storage 10

Energy Technology / Battery / Industrial Electrochemistry and Electrochemical Engineering / Physical and Analytical Electrochemistry
San Antonio Ballroom B, Dallas Sheraton Convention Center

Aqueous Systems - Design/Diagnostics 2 – 08:00 – 10:30

Chair(s): Bin Li and Shelley D. Minter

- 08:00 438 **Mechanistic Insights of $\text{V}^{2+}/\text{V}^{3+}$ Reaction on Glassy Carbon for Vanadium Redox Flow Batteries** – H. Agarwal, J. Florian, A. Shelton, B. Goldsmith, and N. Singh (University of Michigan Ann Arbor)

12:10 449 **Diketopyrrolopyrrole Based Derivative for Non-Aqueous Redox Flow Battery** – S. Sharma (Indian Institute of Science Bangalore), R. Suman (Indian Institute of Science - Bangalore), S. Ray (Indian Institute of Science Bangalore), N. Aetukuri (Indian Institute of Science, Bangalore), A. K. Shukla (Indian Institute of Science), and S. Patil (Indian Institute of Science - Bangalore)

Non-Aqueous Systems - Electrolytes/Electrode Materials 2 – 14:00 – 15:40

Chair(s): Pawel J. Kulesza and Jagjit Nanda

14:00 450 **Mechanically Robust Crosslinked Membranes for Non-Aqueous Redox Flow Batteries** – M. Lehmann (Oak Ridge National Laboratory, University of Tennessee), G. Yang, E. C. Self (Oak Ridge National Laboratory), B. Li (Oak Ridge National Laboratory, University of Tennessee), F. M. Delnick, J. Nanda, and T. Saito (Oak Ridge National Laboratory)

14:20 451 **Sodium Thiophosphate Cathodes and Polymeric Membranes for High Energy Density Redox Flow Batteries** – E. C. Self, F. M. Delnick, G. Yang, M. Lehmann, D. B. Gilmer, R. E. Ruther, T. Saito, and J. Nanda (Oak Ridge National Laboratory)

14:40 452 **Design of Mechanically Robust Polymer Membranes for Non-Aqueous Flow Battery** – M. Lehmann, G. Yang, P. Cao, E. C. Self, F. M. Delnick, J. Nanda, and T. Saito (Oak Ridge National Laboratory)

15:00 453 **Fluorenone Based Anolyte for an Aqueous Organic Redox-Flow Battery** – J. Rodriguez Jr. and L. Pozzo (University of Washington)

15:20 454 **Low Temperature Molten Sodium-Based Batteries for Large Scale Electrical Energy Storage** – E. D. Spoeke, S. Percival, L. J. Small, A. Peretti, J. Lamb, and B. R. Chalamala (Sandia National Laboratories)

Non-Aqueous Systems - Design/Diagnostics – 15:50 – 17:30

Chair(s): Jagjit Nanda and Shelley D. Minter

15:50 455 **Real-Time Reservoir Balancing and Leak-Free Nonaqueous Cell Design for Flow Batteries** – K. P. Smith, D. A. Howey, P. Ascencio, and C. W. Monroe (Department of Engineering Science, University of Oxford)

16:10 456 **Investigating Anionic Chemistry of Na-Metal Halide Batteries for Large Scale Energy Storage Applications** – X. Zhan, X. Lu, J. F. Bonnett, N. L. Canfield, H. J. Chang, J. Sepulveda, V. Sprenkle, and G. Li (Pacific Northwest National Laboratory)

16:30 457 **Screening Membranes and Electrolytes for High Performance Nonaqueous Flow Cells** – Z. Liang (Department of Chemistry, University of Kentucky), N. H. Attanayake (Department of Chemistry, University of Kentucky), J. L. Barton (Joint Center for Energy Storage Research, MIT, Department of Chemical Engineering, MIT), F. R. Brushett (Joint Center for Energy Storage Research, MIT, Department of Chemical Engineering, MIT), J. Landon (Department of Chemical and Materials Engineering, Center for Applied Energy Research University of Kentucky), and S. A. Odom (University of Kentucky)

16:50 458 **Generation, Isolation, and Analysis of the Charged States of Organic Redox Flow Battery Materials** – S. A. Odom (University of Kentucky)

17:10 459 **Investigation of Non-Aqueous Electrolyte and Crossover of Perfluorosulfonate Ion Exchange Membrane in a Non-Aqueous Flow Battery** – K. Lou and T. A. Zawodzinski (University of Tennessee, Knoxville, TN, Oak Ridge National Laboratory, Oak Ridge, TN)

A04

Battery Student Slam 3

Battery

San Antonio Ballroom A, Dallas Sheraton Convention Center

A04 Battery Student Slam Session 1 – 08:00 – 11:20

Chair(s): Feng Lin, Guoying Chen, David Mitlin, Susan A. Odom, Laurence J. Hardwick and Veronica Augustyn

08:00 **Introductory Remarks**

08:10 460 **High Performance Li-Ion Battery Electrode with Hierarchical Ordered Porous Microstructure** – M. Azami-Ghadkolai, S. E. Creager, and R. Bordia (Clemson University)

08:20 461 **New Forms of Lithium Metal Anode** – S. Li, H. Wang, J. Whitacre, and K. Matyjaszewski (Carnegie Mellon University)

08:30 462 **An Ultra-Long Cycle Life Sn Anode with High-Rate Performance for Sodium Ion Batteries** – C. Kim (Gyeongsang National University), I. Kim (Gyeongsang National University), H. H. Kim, M. K. Sadan, H. Yeo, G. B. Cho (Gyeongsang National University), J. P. Ahn (Korea Institute of Science and Technology (KIST)), J. H. Ahn, and H. J. Ahn (Gyeongsang National University)

08:40 463 **Electrospun $\text{Ca}_2\text{Fe}_2\text{O}_5$ Nanofibers As Anode for Next Generation Li Ion Batteries** – S. K. Sundriyal and Y. Sharma (Indian Institute of Technology, Roorkee, India)

08:50 464 **Reversible Li Insertion in Guest Free Type II Si Clathrates for Li-Ion Battery Anodes** – A. Dopilka, J. M. Weller (Arizona State University), S. Bobev (University of Delaware), and C. K. Chan (Arizona State University)

09:00 465 **Introduction of New Iron Sulfate Cathode Material for Na-Ion Batteries with Great Power-Capability and out Standing Cyclability** – W. Ko, H. Park, Y. Lee, and J. Kim (Sejong University)

- 09:10 466 **Monoclinic Na_{2.4}V₂(PO₄)₃/Conductive Polymer Composite As High Capacity Cathodes for Na-Ion Batteries** – Y. Lee, H. Park, W. Ko, S. T. Myung, and J. Kim (Sejong University)
- 09:20 467 **A Square Channel Vanadium Phosphite Framework As Cathode for Li- and Na- Ion Batteries** – P. Sandineni, P. Madria (Missouri University of Science & Technology), and A. Choudhury (Missouri University of Science and Technology)
- 09:30 **Break**
- 10:00 468 **The Stability and the Electrochemical Properties of Na₃V³⁺_{2-y}V⁴⁺_y(PO₄)₂F_{3-y}O_y (0 ≤ y ≤ 2)** – H. B. L. Nguyen (ICMCB-CNRS, Univ. Bordeaux, Bordeaux INP, Pessac, France), T. Broux (LRCS, Université de Picardie Jules Verne, Amiens, France), P. Sanz Camacho (ICMCB), F. Fauth (CELLS - ALBA Synchrotron, Barcelona, SPAIN), D. Carlier, J. Olchowka (ICMCB-CNRS, Univ. Bordeaux, Bordeaux INP, Pessac, France), C. Masquelier (LRCS, Université de Picardie Jules Verne, Amiens, France), and L. Croguennec (ICMCB-CNRS, Univ. Bordeaux, Bordeaux INP, Pessac, France)
- 10:10 469 **Three-Dimensional Compositional and Charge Heterogeneities in Sodium Layered Oxide Cathode Materials** – M. M. Rahman and F. Lin (Department of Chemistry, Virginia Tech)
- 10:20 470 **Improving Reversibility of Anionic Redox Reaction of NaVO₃ By Metal Doping for Sodium-Ion Batteries** – B. Su and D. Y. W. Yu (City University of Hong Kong)
- 10:30 471 **Plasma Enhanced Formation of Lithium Nitride As Artificial SEI Layer for Lithium Metal Batteries** – K. Chen, R. Pathak, Q. Qiao, and Y. Zhou (South Dakota State University)
- 10:40 472 **Polymeric Coating on Lithium Metal Surface for the Stabilization of Electrode-Electrolyte Interface** – H. Zhou, H. Liu, and P. Liu (University of California San Diego)
- 10:50 473 **Taming Cathode-Solid Electrolyte Interfaces with Organic Cathode Materials for All-Solid-State Batteries** – F. Hao, X. Chi, Y. Liang, and Y. Yao (University of Houston)
- 11:00 474 **Enhanced Solid Electrolyte Interface (SEI) on Li Metal Surfaces through Catalytic Electrolyte Decomposition** – J. A. Lochala, B. Wu (University of Arkansas), T. Tarverne (SUNY Polytechnic Institute), and J. Xiao (Pacific Northwest National Laboratory)
- 11:10 475 **Stress-Induced Interface Instability during Ion Intercalation in Battery Compounds** – Y. Zhang and M. Tang (Rice University)
- 14:10 477 **Understanding the Roles of Mass Transport in Electrochemical Plating Process of Lithium** – Y. Tian, B. Wu, J. A. Lochala (University of Arkansas), and J. Xiao (Pacific Northwest National Laboratory, University of Arkansas)
- 14:20 478 **Correlation between Pulse Charging, Volume Expansion and Structural Degradation in Silicon Electrodes for Li-Ion Batteries** – L. S. de Vasconcelos and K. Zhao (Purdue University)
- 14:30 479 **Effects of Porous Separators on Dendrite Growth in Lithium Batteries** – A. Cannon and E. Ryan (Boston University)
- 14:40 480 **Identifying the Performance Limitations of Layered Oxide Sodium-Ion Batteries Using EIS** – L. A. Middlemiss (The University of Sheffield), A. J. R. Rennie, R. Sayers (Faradion Limited), and A. R. West (The University of Sheffield)
- 14:50 481 **Anionic Redox in Li-Rich Rocksalt Oxides Studied Via X-Ray Photoelectron Spectroscopy** – J. A. Coca Clemente, L. J. Hardwick, and V. R. Dhanak (University of Liverpool)
- 15:00 482 **Defect-Enhanced Phase Transformation Kinetics in Intercalation Compounds** – K. Yang, L. Hong, and M. Tang (Rice University)
- 15:10 483 **First Principles Investigation of Grain Boundary Effects in Perovskite-Type Lithium Lanthanum Titanate Solid Electrolyte** – P. R. Conlin and K. Cho (The University of Texas at Dallas)
- 15:20 484 **Understanding the Reaction Uniformity during Discharge of Thick Electrodes** – F. Wang and M. Tang (Rice University)
- 15:30 **Break**
- 16:00 485 **Role of Coprecipitation and Calcination of Precursors on Phase Homogeneity and Electrochemical Properties of Battery Active Materials** – H. Dong, A. Wang, and G. Koenig (University of Virginia)
- 16:10 486 **Drop-on-Demand 3D Printed Lithium-Ion Batteries** – I. Ben Barak (Tel Aviv University), D. Schneier (School of Chemistry, Tel Aviv University), Y. Kamir, M. Goor, I. Shekhtman, D. Golodnitsky (Tel Aviv University), and E. Peled (School of Chemistry, Tel Aviv University)
- 16:20 487 **Understanding the Electrochemical Deposition Process of Silver Metal** – W. A. Martin, J. A. Lochala, B. Wu (University of Arkansas), and J. Xiao (Pacific Northwest National Laboratory)
- 16:30 488 **Nanomanufacturing Transition Metal Oxide Composite Electrode Architectures Via Electrodeposition** – M. Spencer, O. Yildiz, P. Bradford, and V. Augustyn (North Carolina State University)

A04 Battery Student Slam Session 2 – 14:00 – 17:20

Chair(s): Feng Lin, Veronica Augustyn, David Mitlin, Guoying Chen, Laurence J. Hardwick and Susan A. Odom

- 14:00 476 **Proton Polymer Electrolytes in Fuel Cell** – T. Safari (University of Qom) and M. Safari (Payam Noor Delijan University)

- 16:40 489 **Influence of the Formulation on the Microstructure and Thus Performance of Li-Ion Batteries** – O. Rynne (Université de Montréal), M. Dubarry (University of Hawaii, Hawaii Natural Energy Institute), C. Molson (Pierre-and-Marie-Curie University), D. Lepage (Université de Montréal), D. Ayme-Perrot (Total), A. Prébé (Hutchinson SA), D. Rochefort (Université de Montréal), and M. Dollé (Department of Chemistry, University of Montreal)
- 16:50 490 **3D Porous Urchin-like $\text{NH}_4\text{V}_3\text{O}_8 \cdot 2\text{H}_2\text{O}$ Microspheres Constructed for High-Performance and Long-Life Rechargeable Aqueous Zinc Ion Battery** – J. Lai, W. Xu, and Y. Wang (Louisiana State University)
- 17:00 491 **Electrode Design for Improving Fast Charging Performance without Loss of Energy Density in Lithium Ion Batteries** – D. W. Kim (SKKU advanced material & science engineering), J. B. Yoo, and Y. J. Kim (SKKU Advanced Institute of Nanotechnology (SAINT))
- 17:10 492 **Effect of Carbon Nanohorns on the Electrochemical Performance of Orthorhombic, Hexagonal and Monoclinic Tungsten Trioxide Nanoplatelets As High-Energy Anode Material for Lithium-Ion Batteries** – S. R. Sahu, V. R. Rikka (ARCI), P. Haridoss (IIT Madras), R. Gopalan, and R. Prakash (ARCI)
- 10:40 599 **Overcharging $\text{Li}(\text{Ni}_{0.5}\text{Mn}_{0.3}\text{Co}_{0.2})\text{O}_2//\text{Graphite}$ Cells: A Systematic Study** – I. Bloom, N. L. Dietz Rago (Argonne National Laboratory), D. G. Graczyk, Y. Tsai, S. Naik, E. Lee (Argonne National Lab), Z. Du, Y. Sheng, J. Li (Oak Ridge National Laboratory), D. L. Wood III (University of Tennessee), L. A. M. Steele (Sandia National Laboratories), J. Lamb (Sandia National Laboratories), S. Spangler (Sandia National Labs), C. Grosso, and K. R. Fenton (Sandia National Laboratories)
- 11:00 600 **Long-Term Aging – Overdischarge Degradation Mechanisms Interplay in Li-Ion Pouch Cells** – D. Juarez-Robles (Purdue University), J. A. Jeevarajan (Underwriter's Laboratories Inc.), and P. P. Mukherjee (Purdue University)

Novel Materials and Structures – 13:00 – 15:50
Chair(s): Xuning Feng and Loraine Torres-Castro

- 13:00 **Introductory Remarks**
- 13:10 601 **(Invited) A New Paradigm of Li-Ion Batteries for Both High Safety and High Specific Energy** – C. Y. Wang (Electrochemical Engine Center, Pennsylvania State Univ.)
- 13:50 602 **Considering Cracking and Dissolution in the Evolution of Solid Electrolyte Interphase (SEI) during Lithium-Ion Battery Cycling** – L. Liu and P. Guan (The University of Kansas)
- 14:10 603 **Modeling and Experimental Studies of Zn Dendrites Formation and Growth** – V. Yurkiv, T. Foroozan, A. Ramasubramanian (University of Illinois at Chicago), R. Paoli (Argonne National Laboratory, University of Illinois at Chicago, Chicago), M. Ragone, R. Shahbazian-Yassar, and F. Mashayek (University of Illinois at Chicago)
- 14:30 604 **Chemically-Engineered Host Materials Enabling Safe Sodium Metal Anodes** – C. Wang, H. Wang, J. Luo, and W. Li (Dartmouth College)
- 14:50 605 **Durability and Reliability of Commercial Lithium-Ion Cells As a Function of Chemistry and Cycling Conditions** – Y. Preger, H. M. Barkholtz, A. Fresquez, F. A. Mier, B. R. Chalamala, and S. Ferreira (Sandia National Laboratories)
- 15:10 606 **The Influence of Grain Structure in SEI on Lithium Diffusivity and Electrodeposition in Li-Metal Batteries** – A. Ramasubramanian, V. Yurkiv, M. Ragone, T. Foroozan, R. Shahbazian-Yassar, and F. Mashayek (University of Illinois at Chicago)
- 15:30 607 **Thermally Stable Aramid Nanofiber Separators for Energy Storage** – A. Patel, K. Wilcox, I. George, R. Juneja, and J. L. Lutkenhaus (Texas A&M University)

A06

Battery Safety and Failure Modes

Battery / Industrial Electrochemistry and Electrochemical Engineering

State Room 1, Dallas Sheraton Convention Center

Safety Under Fast Charging Protocols – 08:00 – 11:20

Chair(s): Guangsheng Zhang and Boryann Liaw

- 08:00 **Welcoming Remarks**
- 08:10 595 **(Invited) Extreme Fast Charging of Lithium-Ion Battery: Understanding Bottlenecks and Safety Issues** – T. R. Tanim, E. J. Dufek (Idaho National Laboratory), M. C. Evans (Idaho National Lab), C. C. Dickerson, and B. Liaw (Idaho National Laboratory)
- 08:50 596 **(Invited) Lithium Plating and Its Impact on the Safety of Lithium-Ion Cell** – J. Zhang (Beijing Co-innovation Center for Electric Vehicles, Tsinghua University), Z. Liu, P. Dong, and Z. Li (Tsinghua University)
- 09:30 **Break**
- 10:00 597 **Non-Uniform Li Plating Behavior of Li-Ion Cells in a Battery Pack with Bottom, Symmetric Top-Bottom, or Side Cooling Thermal Management Systems during Fast Charging** – M. M. Forouzan (SF Motors Inc, SF Motors), S. Khaleghi Rahimian (SF Motors), S. Han, Y. Liu, and Y. Tang (SF Motors Inc)
- 10:20 598 **Detection and Quantification of Lithium Plating on Graphite in Low Temperature and Fast Charging Operation** – C. Fear, A. N. Mistry (Purdue University), R. E. Carter, C. T. Love (U.S. Naval Research Laboratory), and P. P. Mukherjee (Purdue University)

Energy Harvesting – 08:00 – 11:20

Chair(s): Jeffrey L. Blackburn

- 08:00 621 *(Invited)* Large Low Temperature Thermoelectric Power Factor from Nanostructured Carbon-Based Nanocoatings – J. Grunlan (Texas A&M University)
- 08:20 622 *(Invited)* Thermoelectric properties of Fermi-level tuned and Aligned Single Wall Carbon Nanotubes – K. Yanagi (Tokyo Metropolitan University)
- 08:40 623 *(Invited)* Controlling Energy Transport in Tailored Carbon Nanotubes Networks for Energy Harvesting Applications – A. J. Ferguson and J. L. Blackburn (National Renewable Energy Laboratory)
- 09:00 624 *(Invited)* High Performance Carbon Nanotube–Laminated Perovskite Solar Cells – A. Shawky, I. Jeon, R. Xiang, T. Inoue (The University of Tokyo), Y. Matsuo (University of Science and Technology of China, The University of Tokyo), and S. Maruyama (The University of Tokyo, AIST)
- 09:20 625 *(Invited)* Benzothiadiazole-Based Dye Photosensitizers for Water Splitting Using Dye-Encapsulated Carbon Nanotubes – Y. Takaguchi (Okayama University), H. Miyake (Yamaguchi University), R. Sagawa, D. Miyamoto, and T. Tajima (Okayama University)
- 09:40 Break
- 10:00 626 Carbon Nanotubes to Outperform Metal Using Dopant Engineering and Hole-Transporting Layer Control in Perovskite Solar Cells – I. Jeon, A. Shawky (The University of Tokyo), E. Kauppinen (Aalto University School of Science), Y. Matsuo (University of Science and Technology of China), and S. Maruyama (The University of Tokyo)
- 10:20 627 Long-Lived Free Charge Carriers at Heterojunctions between Semiconducting Single-Walled Carbon Nanotubes and Perylene Diimide Electron Acceptors – H. S. Kang (National Renewable Energy Laboratory), O. Reid (University of Colorado at Boulder), T. J. Sisto, S. Peurifoy, B. Zhang, C. Nuckolls (Columbia University), and J. L. Blackburn (National Renewable Energy Laboratory)
- 10:40 628 Triangular Carbon Quantum Dots with Narrow Bandwidth Emission for LEDs – L. Fan (Beijing Normal University)
- 11:00 629 The Feasibility of Energy Extraction from Acidic Wastewater By Capacitive Mixing with a Molecular-Sieving Carbon Cathode – B. Shapira (Bar Ilan University), E. Avraham (Bar-Ilan University), and D. Aurbach (Bar Ilan University)

Catalysis 1 – 11:20 – 12:20

Chair(s): Min-Kyu Song

- 11:20 630 Stable Lithium-Sulfur Full Cell Enabled By Dual Functional Interconnected Mesocarbon Array – H. Zhu (Hongli Zhu)
- 11:40 631 *(Invited)* Functional Design of Nanoscale Carbon for Active and Durable Electrocatalyst – S. Park, C. Y. Ahn, J. M. Yoo, and Y. E. Sung (Seoul National University (SNU))
- 12:00 632 Scalable Pore Size Tuning Process for Seeking Better Cathode of Lithium Ion Capacitor and Development of High-Performance Full Cell Device through It – J. H. Won and J. K. Kang (Korea Advanced Institute of Science and Technology)

Catalysis 2 – 14:00 – 17:00

Chair(s): Jeffrey L. Blackburn and Xiulei Ji

- 14:00 633 *(Invited)* Robust Two- and Three-Dimensional Conjugated Organic Structures for Electrochemical Applications – J. B. Baek (UNIST)
- 14:20 634 Positive Effect of Induced Hydrophobicity in 3D N-Doped Porous Graphene Towards ORR Activity Under Acidic Condition – S. Singh, K. Takeyasu, M. Furukawa (University of Tsukuba, Japan), and J. Nakamura (University of Tsukuba)
- 14:40 635 Recent Mechanistic Understanding of Oxygen Reduction Reaction over Pt-Supported 3D Carbon Nanofiber Catalysts – B. Liu, J. Xu, A. Elangovan, and J. Li (Kansas State University)
- 15:00 636 Single-Walled Carbon Nanotube-*Clostridium Ljungdahlii* hybrid for Carbon Dioxide Fixation to Value-Added Chemicals – Z. Li, D. Svedruzic, W. Xiong, B. J. Tremolet de Villers, and J. L. Blackburn (National Renewable Energy Laboratory)
- 15:20 637 *(Invited)* Non-Precious Metal Catalysts with Designed Carbon Nanostructures and Controlled Active Sites for Oxygen Reduction Reaction and CO₂ Reduction – J. Lee (Korea Advanced Institute of Science and Technology)
- 15:40 Break
- 16:00 638 Phosphorus and Iron Doped-Porous Carbon As an Efficient Electrocatalyst for Oxygen Reduction Reaction in Alkaline Medium – N. Norouzi, F. A. Choudhury, and H. M. El-Kaderi (Virginia Commonwealth University)
- 16:20 639 Hybrid Graphene/Metal Oxygen Reduction Reaction Catalyst: An Insight at Sandwiched Single Layer Graphene Interdiffusion Barrier, Preserving Sharp Metallic Interface for Atomically-Thin Core@Shell Architectures – A. Abdelhafiz (Georgia Institute of Technology), A. Vitale (Pacific Northwest National Laboratory), and F. M. Alamgir (Georgia Institute of Technology)

16:40 640 **Development of Bimetallic Non-Platinum Group Metal Catalysts Based on Metal Organic Framework Precursors** – L. LaRochelle Richard, Q. Jia, and S. Mukerjee (Chemistry and Chemical Biology, Northeastern University)

17:20 671 **Biofilms By *E.coli* & *S.Epidermidis* and Its Sensing Possibility By Graphene-Dispersed Silane Coating** – H. Kanematsu (National Institute of Technology Suzuka College), R. Nakagawa (National Institute of Technology, Suzuka College), K. Sano (D&D Corporation), D. M. Barry (Clarkson University), R. Itoh (National Institute of Technology, Suzuka College), H. Yamada (National Institute of Technology, Nara College), N. Hirai (National Institute of Technology Suzuka College), H. Miura (Suzuka University of Medical Science), A. Ogawa, T. Kogo, D. Kuroda (National Institute of Technology Suzuka College), K. Tsunashima (National Institute of Technology Wakayama College), and K. Katakura (National Institute of Technology, Nara College)

B02

Carbon Nanostructures in Medicine and Biology

Nanocarbons / Organic and Biological Electrochemistry / Sensor
City View 6, Dallas Sheraton Hotel

Graphene Biosensor Devices – 14:40 – 15:40

Chair(s): Daniel A. Heller and Delphine Bouilly

14:40 664 **(Invited) Biomedical Applications of Metal Nanoparticle-Decorated Carbon Nanostructures** – A. Star (University of Pittsburgh)

15:00 665 **(Invited) Biocompatible Doped Graphene Quantum Dots Enabling Visible/Near-Infrared Imaging, Drug Delivery and Cancer Detection** – A. V. Naumov, E. Campbell, M. T. Hasan, R. Gonzalez-Rodriguez, and G. R. Akkaraju (Texas Christian University)

15:20 666 **(Invited) Novel Three-Dimensional Fuzzy Graphene (3DFG)-Based Platform for Interrogation of Excitable Cells** – S. K. Rastogi (Carnegie Mellon University, BME), M. Scopelliti (Carnegie Mellon University, ECE), J. Bliley (Carnegie Mellon University, BME), N. Johnson (Carnegie Mellon University, MSE), D. Shiwarski (Carnegie Mellon University, BME), R. Garg (Carnegie Mellon University, MSE), A. Feinberg (Carnegie Mellon University, BME, MSE), M. Chamanzar (Carnegie Mellon University, ECE, BME), and T. Cohen-Karni (Carnegie Mellon University, BME, MSE)

Graphene and Novel Nanocarbons – 16:00 – 18:00

Chair(s): Ardemis Anoush Boghossian and Markita P Landry

16:00 667 **(Invited) Applications and Safety of 2D Materials** – M. Prato (University of TRIESTE)

16:20 668 **(Invited) Graphene for Bioapplications: Toxicological Studies and Integration in 3D-Scaffolds** – E. Vazquez (Universidad de Castilla-La Mancha)

16:40 669 **Carbon Nanostructures and Nanocapsules: Preparation and Biological Behaviour** – T. DaRos (Trieste University)

17:00 670 **(Invited) Fast-Scan Nanogap Voltammetry at Double-Carbon-Fiber Ultramicroelectrodes** – S. Amemiya (University of Pittsburgh)

17:40 672 **Intracellular Imaging and Thermal Sensing Using Fluorescent Carbon Dots** – J. R. Macairan and R. Naccache (Concordia University)

B03

Carbon Nanotubes - From Fundamentals to Devices

Nanocarbons / Physical and Analytical Electrochemistry

Devices 2 – 08:00 – 09:40

Chair(s): Han Htoon

08:00 736 **Charge Transport in Mixed Semiconducting SWCNT Networks with Tailored Diameter Distributions** – M. Brohmann, F. J. Berger (Heidelberg University, Physical Chemistry, Heidelberg University, Centre for Advanced Materials), and J. Zaumseil (Heidelberg University, Physical Chemistry)

08:20 737 **(Invited) Control of Diazonium Chemistry Defects on Nanocarbon Field-Effect Transistors** – D. Bouilly, C. M. Bazan, A. Beraud, and A. Bencherif (Universite de Montreal)

08:40 738 **(Invited) Progress in Carbon Nanotube Terahertz Photodetectors** – F. Léonard (Sandia National Laboratories)

09:00 739 **Functionalized Carbon Nanotube Phototransistors with Sub-Femtowatt Sensitivity at Room Temperature** – K. J. Bergemann (Sandia National Labs) and F. Léonard (Sandia National Laboratories)

09:20 740 **(Invited) Mechanical and Gas Transport Properties of Pristine and Cross-Linked Carbon Nanotube Materials** – A. N. Volkov (University of Alabama)

Optics 2 – 10:00 – 12:20

Chair(s): Jean-Sébastien Lauret

10:00 741 **(Invited) Organic Molecular Tuning of Many-Body Interaction Energies in Air-Suspended Carbon Nanotubes** – S. Tanaka, K. Otsuka (RIKEN), K. Kimura (RIKEN, The University of Tokyo), A. Ishii, H. Imada, Y. Kim, and Y. K. Kato (RIKEN)

10:20 742 **(Invited) sp^3 Defects of Single Walled Carbon Nanotubes: Photonic and Electronic Integration** – H. Htoon (MPA-CINT, Los Alamos National Laboratory)

- 10:40 743 **(Invited) Super-Localization of Excitons in Carbon Nanotubes at Cryogenic Temperatures** – C. Raynaud (Ecole Normale Supérieure, Université Paris Diderot), T. Claude (Université Paris Diderot, Ecole Normale Supérieure), R. Amara (NTU, Singapore, Sorbonne Université), A. Graf (Heidelberg University), J. Zaumseil (Heidelberg University, Physical Chemistry), J. S. Laurent (Laboratoire Aimé Cotton, ENS Paris Saclay), Y. Chassagneux (CNRS), and C. Voisin (Ecole Normale Supérieure)
- 11:00 744 **Decay Dynamics and Diffusion Lengths of Bright and Dark Excitons in Air-Suspended Carbon Nanotubes** – A. Ishii (RIKEN), H. Machiya (RIKEN, The University of Tokyo), and Y. K. Kato (RIKEN)
- 11:20 745 **Photoluminescence Intensity Fluctuations and Temperature-Dependent Decay Dynamics of Individual Carbon Nanotube Sp^3 Defects** – Y. Kim (MPA-CINT, Los Alamos National Laboratory), K. Velizhanin (Theoretical Division, Los Alamos National Laboratory), X. He, I. Sarpkaya (MPA-CINT, Los Alamos National Laboratory), Y. Yomogida, T. Tanaka, H. Kataura (Nat. Inst. of Advanced Industrial Science and Technology), S. K. Doorn, and H. Htoon (MPA-CINT, Los Alamos National Laboratory)
- 11:40 746 **(Invited) Thermo-Excitonic Properties of Semiconducting Single-Walled Carbon Nanotubes** – Y. Miyauchi (Institute of Advanced Energy, Kyoto University, Graduate School of Science, Nagoya University)
- 12:00 747 **Nanocarbons through the Artist's Lens** – J. Cohen, J. Harvey (Memorial Sloan Kettering), Y. Chyan, J. M. Tour (Rice University), and D. A. Heller (Weill Cornell Medicine, Cornell University)

Devices 3 – 14:00 – 14:40

Chair(s): Tomohiro Shiraki

- 14:00 748 **Flexible PDMS Foams Decorated with Multi-Walled CNTs for Unprecedented Detection of Ultralow Strain and Pressure Coupled with Large Working Range** – R. Iglío, S. Mariani, V. Robbiano (University of Pisa), L. Strambini (Italian National Research Council), and G. Barillaro (University of Pisa)
- 14:20 749 **Carbon Nanotube-Inorganic Hybrid Systems and Devices** – M. Palma (Queen Mary University of London)

B08 Porphyrins, Phthalocyanines, and Supramolecular Assemblies

Nanocarbons / Organic and Biological Electrochemistry
City View 7, Dallas Sheraton Hotel

Porphyryns at Solid Surfaces – 08:00 – 09:40

Chair(s): K W Hipps and Ursula Mazur

- 08:00 916 **Adsorption and Desorption Rates for Porphyrins and Phthalocyanines on Gold from Solution.** – K. W. Hipps and U. Mazur (Washington State University)

- 08:20 917 **Cooperative Dynamics in Oxygen Binding Reaction to Cobalt Porphyrins at the Solution/Solid Interface** – U. Mazur and K. W. Hipps (Washington State University)

- 08:40 918 **Gas Phase Synthesis and Deposition of Directly Fused Porphyrin Tapes: Reaction Mechanism and Central Metal Ion Effect.** – G. Bengasi (Luxembourg Institute of Science and Technology, Johannes Gutenberg University of Mainz), K. Baba (Luxembourg Institute of Science and Technology), O. Back (Johannes Gutenberg University of Mainz), O. De Castro, G. Frache (Luxembourg Institute of Science and Technology), K. Heinze (Johannes Gutenberg University of Mainz), and N. D. Boscher (Luxembourg Institute of Science and Technology)

- 09:00 919 **Conductive Directly Fused Metalloporphyrin Coatings By Chemical Vapour Deposition – from Singly to Triply Fused** – N. D. Boscher (Luxembourg Institute of Science and Technology), G. Bengasi (Luxembourg Institute of Science and Technology, Johannes Gutenberg University of Mainz), K. Baba (Luxembourg Institute of Science and Technology), K. Heinze (Johannes Gutenberg University of Mainz), and G. Frache (Luxembourg Institute of Science and Technology)

- 09:20 920 **Site-Specific Coordination Chemistry and Beyond: Novel Properties in Low Dimensional Supramolecular Architectures of Porphins at Surfaces** – J. Girovsky (Paul Scherrer Institute, present address: University of Cambridge), M. Baljovic (Paul Scherrer Institute, EMPA Materials Science and Technology), S. Nowakowska (University of Basel), J. Nowakowski (Paul Scherrer Institute), C. Wäckerlin (Paul Scherrer Institute, EMPA Materials Science and Technology), J. Dreiser (Paul Scherrer Institute), J. Lobo Checa (University of Zaragoza), L. Gade (University of Heidelberg), S. Decurtins, S. X. Liu (University of Bern), P. Oppeneer (University of Uppsala), N. Ballav (IISER Pune, India), and T. A. Jung (Paul Scherrer Institute)

Energy Conversion – 10:00 – 12:20

Chair(s): Timothy P Bender and Fernando Langa

- 10:00 921 **Electrochemical Advances in Boron Subnaphthalocyanines (BsubNcs) for Organic Photovoltaic Applications: The Ambient Stability of Bsubnc Mixed Alloys; Their Separation and Electrochemical Properties; And Chemical Progresses Towards Pure Bsubncs to Yield Their Individual Electrochemical Evaluation** – T. P. Bender (Department of Chemical Engineering and Applied Chemistry)
- 10:20 922 **Structural Design of Porphyrins for Binary and Ternary Organic Solar Cells with High Efficiency and Low Energy Loss** – V. Cuesta (Univ. Castilla-la Mancha), M. Vartanian (Univ. Castilla-la Mancha), G. Sharma (LNM Inst. of Information Technology Demed University), P. de la Cruz, and F. Langa (Universidad de Castilla-La Mancha)

- 10:40 923 **Molecular Design of Metal Phthalocyanines with Strong Electron-Donating Substituents for Perovskite Solar Cells** – G. Zanotti (National Research Council - Italy)
- 11:00 924 **Metallomacrocyclic-Driven Atomically Dispersed M-N_x Sites on Carbon Nanostructures for Electrocatalytic Energy Conversion Reactions** – S. H. Joo (Ulsan National Institute of Science and Technology)
- 11:20 925 **Advanced Polyphthalocyanine-Derived Electrode Materials for Energy Storage and Conversion** – L. Liu, S. Yang, Y. Qin, Z. Zhang, and F. Wang (Beijing University of Chemical Technology)
- 11:40 926 **Star-Shaped Magnesium Tetraethynylporphyrin Bearing Four Peripheral Electron-Accepting Functionalities for Organic Solar Cell** – Y. Matsuo (University of Science and Technology of China) and H. Wang (University of Science and Technology of China)
- 12:00 927 **Charge Transport within Metal-Organic Frameworks: The Role of Topologically Controlled Charge Hopping Process** – P. Deria (Southern Illinois University Carbondale), K. Maindan, and X. Li (Southern Illinois University-Carbondale)

Catalysis – 14:00 – 15:40

Chair(s): Dorota Gryko and David L Officer

- 14:00 928 **Porphyrin and Phthalocyanine Graphene Assemblies As Electrocatalysts for CO₂ Reduction** – D. L. Officer (University of Wollongong)
- 14:20 929 **Degradation and Stabilization of Porphyrin-Based Metal Organic Framework Electrocatalysts for the Oxygen Reduction Reaction** – M. B. Stevens (Stanford University, Department of Chemical Engineering), G. Chen, Y. Liu (Stanford University, Department of Materials Science and Engineering), L. King (Stanford University, Department of Chemical Engineering), R. Sinclair (Stanford University, Department of Materials Science and Engineering), Z. Bao, and T. F. Jaramillo (Stanford University, Department of Chemical Engineering)
- 14:40 930 **Hydrogen and Oxygen Evolution Reactions Catalyzed By Metal Porphyrins and Corroles** – R. Cao (Shaanxi Normal University)
- 15:00 931 **Homogeneous and Heterogeneous Porphyrin Architectures for Electrocatalysis** – G. F. Moore, B. L. Wadsworth, D. Khusnutdinova, M. Flores, A. M. Beiler, E. A. Reyes Cruz, Y. Zenkov, and J. M. Urbine (Arizona State University)
- 15:20 932 **Vitamin B₁₂ - a Bioinspired Catalyst for Organic Reactions** – D. Gryko (Institute of Organic Chemistry Polish Academy of Sciences)

Supramolecular Architectures – 16:00 – 18:00

Chair(s): Nathalie Sollandie and Jonathan P. Hill

- 16:00 933 **Subphthalocyanine Fused Dimer and Subphthalocyanines Conjugates** – G. Zango, V. Mariñas, O. Fernandez-Vera, L. Gallego, G. Lavarda, D. P. Medina, M. V. Martínez-Díaz (Autonoma University of Madrid), and T. Torres (Autonoma University of Madrid, IMDEA Nanociencia, 28049 Madrid, Spain)
- 16:20 934 **Light Triggers Molecular Shuttling in Rotaxanes** – D. M. Guldi (Universität Erlangen-Nürnberg)
- 16:40 935 **Helical Supramolecular Porphyrin Assemblies** – T. Haino (Graduate School of Science, Hiroshima University)
- 17:00 936 **Nucleosides As Organizing Architectural Moieties.** – N. Sollandie (Laboratoire de Chimie de Coordination - CNRS)
- 17:20 937 **Self-Assembly and Sensing Properties of Rim-Functionalized Oxoporphyrinogens** – J. P. Hill (WPI Center for Materials Nanoarchitectonics), M. K. Chahal (National Institute for Materials Science), J. Labuta (WPI Center for Materials Nanoarchitectonics), D. Payne (National Institute for Materials Science), W. Webre, F. D'Souza (University of North Texas), and K. Ariga (WPI Center for Materials Nanoarchitectonics)
- 17:40 938 **Dynamic Molecular Invasion into Multiply Interlocked Catenane Composed of Porphyrins and Phthalocyanine** – K. Tanaka, Y. Yamada, R. Ito, S. Ogino (Nagoya University), and T. Kato (Kyoto University)

B09

Nano for Industry

Nanocarbons / Industrial Electrochemistry and Electrochemical Engineering / Physical and Analytical Electrochemistry / Interdisciplinary Science and Technology Subcommittee / Dielectric Science and Technology
City View 5, Dallas Sheraton Hotel

NANO for Industry 1 – 08:00 – 09:40

Chair(s): Elena Bekyarova

- 08:00 957 **(Invited) A New Category of Transparent Conductive Films: Printed Carbon Nanotube Hybrids** – R. A. Prada Silvy and D. J. Arthur (Chasm Advanced Materials)
- 08:20 958 **(Invited) All-in-One Graphene Composite-Based Fiberwearable Supercapacitor** – A. Yu (University of Waterloo)
- 08:40 959 **(Invited) Advanced Nanostructured Electrode Materials for Lithium-Sulfur Batteries** – Z. Chen (University of Waterloo)
- 09:00 960 **Facile Synthesis of Industrially Scalable and Cost Effective WO₃ for Electrochromic Device and Photocatalysis** – M. Rakibuddin, M. A. Shinde, and H. Kim (Yeungnam University)
- 09:20 961 **The Industrial Advantages of Arginine Capped Magnetite Nanoparticles** – F. Kashanian and M. Habibi-Rezaei (School of Biology College of Science University of Tehran)

NANO for Industry 2 – 10:00 – 11:40

Chair(s): Aiping Yu

- 10:00 962 *(Invited)* Nano-FTIR Correlation Nanoscopy for Organic and Inorganic Material Analysis – S. Mastel, N. F. Hartmann, and T. Gokus (neaspec GmbH)
- 10:20 963 *(Invited)* Nanostructured Materials for Higher Energy and Higher Power Lithium-Ion Batteries – G. Yushin (Georgia Institute of Technology, Sila Nanotechnologies, Inc.)
- 10:40 964 *(Invited)* Design of Metal - Carbon Nanotube Structures for Electronic and Optoelectronic Applications – W. Li, M. Chen, and E. Bekyarova (University of California, Riverside)
- 11:00 965 *(Invited)* Synthesis and Properties of All SWCNT Metallic Nanotube Wire – D. Lashmore, P. Bystricky, and J. Bulmer (American Boronite Corporation)
- 11:20 966 *(Invited)* Stray Light Suppression Using Carbon Nanotube Based Black Coating – D. Wang, T. D. Hall (Faraday Technology, Inc.), R. Radhakrishnan (Faraday Technology), M. Inman, E. J. Taylor, B. Skinn, and S. Snyder (Faraday Technology, Inc.)

NANO for Industry: Keynote Speaker Session 1 – 11:40 – 12:20

Chair(s): Slava V. Rotkin

- 11:40 967 *(Keynote)* Nanomaterials Transitions to Industry: Energy, Medicine and Devices – J. M. Tour (Rice University)

NANO for Industry: Keynote Speaker Session 2 – 14:00 – 16:00

Chair(s): Slava V. Rotkin

- 968 *(Keynote)* Electrochemical Artificial Muscle Yarns and Textiles That Harvest and Store Environmentally Available Energies – R. H. Baughman (Alan G. MacDiarmid NanoTech Institute, UTD)
- 969 *(Keynote)* Facile Sorting of Single Walled Carbon Nanotubes According to Their Electronic Types – M. Chan-Park (NTU)
- 970 *(Keynote)* Some Commercialization Successes in Unconventional Micro/Nanotechnologies – J. A. Rogers (Northwestern University)

NANO for Industry: Panel Session – 16:20 – 18:00

Chair(s): Slava V. Rotkin

- 16:20 Panel Discussion

**Corrosion General Session**

Corrosion

City View 1, Dallas Sheraton Hotel

Corrosion in Various Environments 2 – 08:20 – 12:00

Chair(s): Jamie Noel and Masayuki Itagaki

- 08:20 1020 **Corrosion Mechanisms of Austenitic Steel in Salt Rock Repositories of High-Level Radioactive Waste** – A. G. Munoz (Gesellschaft für Anlagen- und Reaktorsicherheit GRS) and D. Schild (Karlsruher Institut für Technologie KIT)
- 08:40 1021 **High Temperature Oxidation of Zircaloy-4 Under Conditions Simulating a Loss of Cooling Accident in Spent Fuel Pools Examined with Raman Imaging and ¹⁸O Tracer Techniques** – A. Kasperski (LEPMI-CNRS, IRSN), M. Guérain (IRSN, LEPMI-CNRS), M. Gestin (IRSN, Mines Saint-Etienne), C. Duriez (IRSN), and M. Mermoux (LEPMI-CNRS)
- 09:00 1022 **Microstructural Evolution of 52M Weld Metal Near the Fusion Boundary and Oxide Films Formed in Simulated PWR Primary Water** – K. Zhang (Shanghai University, School of Mater. Sci. & Eng.), J. Ma (Shanghai University), F. Ning (Shanghai University, School of Mater. Sci. & Eng.), T. Cui (Shanghai University, School of Mater. Sci. & Eng.), Y. Jia (Shanghai University, School of Mater. Sci. & Eng.), and Z. Lu (School of Mater. Sci. and Eng., Shanghai University)
- 09:20 1023 **Corrosion Behavior of Steel Buried in Soil Under Natural Rainfall Conditions at Outdoor Test Field** – S. Mineta, S. Ohki, M. Mizunuma, and M. Tsuda (NTT Device Technology Labs, NTT Corporation)
- 09:40 Break
- 10:00 1024 **The Interdependent Deposit-Metal Interaction during Underdeposit Corrosion (UDC)** – A. N. Shamsó (Imperial College London), A. M. Abdullah (Qatar University), N. Laycock (Qatar Shell), and M. P. Ryan (Imperial College London)
- 10:20 1025 **Fatigue and Static Crack Growth Rate Study of Carbon Steel for Corrosion Prevention of Natural Gas Transmission Pipelines** – J. H. Tylczak (National Energy Technology Laboratory), A. Chandra, R. Thodla (DNV USA), and M. Ziomek-Moroz (DOE/NETL)
- 10:40 1026 **Corrosion Behavior of Ni-Mo Alloys in CO₂-Saturated Salinity Environment at Gas Hydrate Formation Temperatures** – C. E. Ozigagu, T. Zhou, S. Sanders, and T. D. Golden (University of North Texas)
- 11:00 1027 **Magnetic Field Effect on Anodic Dissolution of Axle Steel in Bicarbonate Solution with Chlorides** – F. Ning (Shanghai University, School of Mater. Sci. & Eng.), K. Zhang (Shanghai University, School of Mater. Sci. & Eng.), T. Cui (Shanghai University, School of Mater. Sci. & Eng.), S. Ling, J. Ma (Shanghai University), Z. Lu (School of Mater. Sci. and Eng., Shanghai University), and C. Yu (Shanghai University)

- 11:20 1028 **Magnetic Field Effect on Anodic Dissolution Behavior of Iron in Sodium Perchlorate Solution** – S. Cai, Y. Tang (Shanghai University), F. Ning (Shanghai University, School of Mater. Sci. & Eng.), S. Ling (Shanghai University), T. Cui (Shanghai University, School of Mater. Sci. & Eng.), J. Ma (Shanghai University), and Z. Lu (School of Mater. Sci. and Eng., Shanghai University)
- 11:40 1029 **Anodic Polarization Behavior of Iron in Phosphoric Acid Solution Under the Action of Magnetic Field** – Y. Tang, S. Cai (Shanghai University), F. Ning (Shanghai University, School of Mater. Sci. & Eng.), S. Ling (Shanghai University), K. Zhang (Shanghai University, School of Mater. Sci. & Eng.), J. Ma (Shanghai University), Z. Lu (School of Mater. Sci. and Eng., Shanghai University), and C. Yu (Shanghai University)

D01

Chemical Mechanical Polishing 15

Dielectric Science and Technology
Pearl 2, Dallas Sheraton Hotel

Chemical Mechanical Polishing 15 - Session 3 – 08:30 – 12:05

Chair(s): Jason J. Keleher and Vimal H. Chaitanya

- 08:30 **Welcoming Remarks - G. Bahar Basim, University of Florida**
- 08:35 1042 **(Invited) Recent Advances in SiC CMP** – R. L. Rhoades (Revasum)
- 09:15 1043 **Fujimi's New SiC CMP Slurry Development** – S. Hirano (FUJIMI INCORPORATED, Advanced Industrial Science and Technology), S. Takami, N. Noguchi, T. Ishibashi, Y. Ito, H. Oda, S. Arakawa, Y. Mori (FUJIMI INCORPORATED), B. Greene, J. Sanford, J. Riesen (FUJIMI CORPORATION), and T. Kato (Advanced Industrial Science and Technology)
- 09:45 **Break**
- 10:00 1044 **Electrochemical Evaluations for Barrier CMP Optimization** – G. B. Basim (University of Florida) and R. Yagan (Koc University)
- 10:30 1045 **Prediction of Pad Wear Depending on Structural Factors of Diamond Conditioner** – T. Kim (Mechanical Engineering, Sungkyunkwan University, SAINT, Sungkyunkwan University)
- 11:00 1046 **Advances in Pad Conditioning for Enhancement of CMP Process Stability over Pad Life** – A. J. Khanna, P. Jawali, D. Redfield, R. Kakireddy, A. Chockalingam, D. Benvegnu, M. Yang, S. Roza, J. Fung, M. Cornejo, I. Abramson, M. Yamamura, Z. Yuan, and R. Bajaj (Applied Materials Inc.)
- 11:30 1047 **Performance of Trizact™ Microreplicated Pad in W Buff Marathon Process** – A. W. Simpson, J. Stomberg, D. Muradian, D. LeHuu, C. Loesch, and V. Laraia (3M Company, Electronics Materials Solutions Division)
- 12:00 **Concluding Remarks - Robert Rhoades, Revasum**

E01

Electrodeposition for Advanced Node Interconnect Metallization Beyond Copper

Electrodeposition
Pearl 1, Dallas Sheraton Hotel

Cobalt Interconnect – 09:00 – 12:00

Chair(s): Qiang Huang and Shafaat Ahmed

- 09:00 1048 **(Invited) Cobalt Interconnects at 36nm Beol Pitch and Beyond: Material Challenges & Circuit-Level Performance Impact** – N. Lanzillo, K. Yogendra, C. C. Yang, R. Vega (IBM Research), R. Bolam (IBM), K. Choi, R. Robison, and L. Clevenger (IBM Research)
- 09:40 1049 **(Invited) Cobalt Damascene Chemistry for Advanced Interconnect** – E. Najjar and S. Sun (MacDermid Enthone Electronics Solutions)
- 10:00 1050 **(Invited) Cobalt Bottom-up Filling for Advanced Node Interconnect Metallization** – J. Wu, F. Wafula, S. Branagan, H. Suzuki, and J. van Eijsden (Atotech USA, LLC)
- 10:20 1051 **(Invited) Electrodeposition of Ferromagnetic Materials for Advanced Interconnect and MEMS** – T. P. Moffat (NIST), N. L. Ritzert (Theiss Research/NIST), R. Wang (National Institute of Standards and Technology), C. H. Lee (Korea Atomic Energy Research Institute), S. K. Kim (Chung-Ang University), T. Braun, and D. Josell (NIST)
- 10:40 **Break**
- 11:00 1052 **(Invited) In-Situ Investigation of the Role of Boric Acid during the Electrodeposition of Cobalt** – M. A. Miller, J. Wall, J. Sukamto, and E. G. Webb (Moses Lake Industries - Advanced Research Center)
- 11:20 1053 **Electrochemical Nucleation and Growth of Cobalt in Presence of Dioxime Additives** – Y. Hu and Q. Huang (The University of Alabama)
- 11:40 1054 **(Invited) Process Control of Advanced Cobalt Interconnect Plating Bath** – M. Pavlov, E. Shalyt, D. Lin, and J. Wang (ECI Technology)

Copper and Other Metals – 14:00 – 17:20

Chair(s): James Kelly and Jian Zhou

- 14:00 1055 **Improved Copper Damascene Wires Using Direct Plate on Cobalt Process** – L. J. Brogan, Y. Liu, M. M. Huie, J. D. Reid (Lam Research Corporation), J. Kelly (IBM Albany Nanotechnology Center), H. K. Shobha (IBM Research at Albany Nanotech), H. Huang (IBM Research, Albany), K. Motoyama (IBM Research at Albany Nanotech), and C. K. Hu (IBM T.J. Watson Research Center)
- 14:20 1056 **A Effect of Halide on Cobalt Electrodeposition for through-Silicon-Via(TSV) Application** – Y. Kim, J. Lee, K. Park (Hanyang University), C. Lee (Hanyang university), and B. Yoo (Hanyang University)
- 14:40 1057 **Bottom-up Gold Filling of High Aspect Ratio Trenches :Toward a Mechanistic Understanding** – S. Ambrozik (National Institute of Standards and Technology, NIST), T. P. Moffat, and D. Josell (NIST)

- 15:00 **1058 Self-Annealing Behavior of Electroplated Cu in the Blind-Hole Structure** – C. H. Yang, Y. W. Lee, C. Y. Lee, Y. H. Huang, and C. E. Ho (Yuan Ze University)
- 15:20 **Break**
- 15:40 **1059 (Invited) Bottom-up Electrodeposition** – T. Braun, D. Josell, and T. P. Moffat (NIST)
- 16:00 **1060 (Invited) Towards Spatially Resolved Chemical Analysis of Sn/Ag Solder Bumps By Means of Laser Ablation Ionization Mass Spectrometry (LIMS)** – A. Cedeño López, P. Moreno-García (Dpt. of Chemistry and Biochemistry, University of Bern), V. Grimaudo, A. Riedo, M. Tulej, R. Wiesendanger, R. Lukmanov, P. Wurz (Physics Institute, University of Bern), and P. Broekmann (Dpt. of Chemistry and Biochemistry, University of Bern)
- 16:20 **1061 Multi-Scale Study of Branched Electrodeposits** – C. Kharbachi, F. Chauvet, and T. Tzedakis (Laboratoire de Génie Chimique)
- 16:40 **1062 Water-in-Salt Electrolytes for the Electrodeposition of Ruthenium for Interconnect Applications** – W. D. Sides and Q. Huang (The University of Alabama)
- 17:00 **1063 Electroless Metal Deposition Using Multivalent Metal Ions As Reducing Agents** – E. Norkus and L. Tamašauskaitė-Tamašiūnaitė (Center for Physical Sciences and Technology)

Lone Star B/C, Dallas Sheraton Convention Center

E01 Poster Session – 18:00 – 20:00

- **1064 Hybrid Electrodeposition and Characteristics of Ag-Graphene Composite Films on Cu Sheets Toward High-Performance Electric Connectors** – S. Sakaida (Nagoya Institute of Technology), S. Z. S. Kure-Chu (Nagoya Institute of Tehnology), T. Hihara (Nagoya Institute of Technology), and H. Yashiro (Dept. of Chemistry and Bio-Sciences, Iwate University)
- **1065 Extraction Effect of Ni-Zn By Electrodeposition from Aqueous Acid Solutions** – Y. Addi (USTHB-ENPEI)

F01

Industrial Electrochemistry and Electrochemical Engineering General Session

Industrial Electrochemistry and Electrochemical Engineering
Pearl 5, Dallas Sheraton Hotel

Industrial Electrochemistry and Electrochemical Engineering Division General Session 1 – 08:00 – 12:00

Chair(s): Douglas P. Riemer and John A. Staser

- 08:00 **1066 Selective Ion Removal from Water Using Flow-through Electrode Capacitive Deionization** – M. R. Cerón, S. A. Hawks, J. M. Knipe, C. K. Loeb, C. Zhan, T. A. Pham, M. Stadermann, and P. G. Campbell (Lawrence Livermore National Laboratory)
- 08:20 **1067 Capacitive Deionization Using Activate Carbon Electrodes Obtained from Different Precursors** – K. M. Barcelos, R. L. Zornitta, and L. A. M. Ruotolo (Federal University of Sao Carlos)
- 08:40 **1068 Asymmetric Redox Active Electrodes for Brackish Water Deionization and Selective Adsorption of Micro-Pollutants** – F. He, A. Hemmatifar, M. Z. Bazant, and T. A. Hatton (Massachusetts Institute of Technology)
- 09:00 **1069 Ag Membranes for Electrochemical CO₂ to CO Conversion in an MEA Type Set-up** – B. Seger, G. Larrazabal, P. Strøm-Hansen, J. P. Heli (Technical University of Denmark), and K. Therkildsen (Siemens A/S)
- 09:20 **1070 Intensifying the CO₂ Electrolysis Process** – S. Bhargava (University of Illinois Urbana-Champaign, Intl. Institute of Carbon Neutral Energy Research), F. Proietto (University of Illinois Urbana-Champaign, Università degli Studi di Palermo), D. Azmoodeh (University of Illinois Urbana-Champaign), D. A. Henckel, X. S. Chen, E. R. Cofell (University of Illinois Urbana-Champaign, Intl. Institute of Carbon Neutral Energy Research), S. Verma (University of Illinois Urbana-Champaign, Royal Dutch Shell Inc.), J. Pigos, C. J. Brooks (Honda Research Institute USA Inc.), A. A. Gewirth, and P. J. A. Kenis (University of Illinois Urbana-Champaign, Intl. Institute of Carbon Neutral Energy Research)
- 09:40 **Break**
- 10:00 **1071 Effects and Characterizations of Pulse Electrodeposition Parameters of Silver on Surface Roughness and Scattering Parameters of Horn Antennas** – C. Başaran (ASELSAN Inc., Middle East Technical University) and I. Karakaya (Middle East Technical University)
- 10:20 **1072 Electrochemical Investigation of the Cu²⁺ → Cu¹⁺ Reduction Reaction in Ethaline Deep Eutectic Solvent** – K. Steinberg, D. Shen, N. Shaheen, and R. Akolkar (Case Western Reserve University)
- 10:40 **1073 Selective Electroless Copper Plating on a Polymer Substrate Via Magnetic Field Application** – S. Danilova, J. E. Graves (Coventry University), G. W. V. Cave (Nottingham Trent University), and A. J. Cobley (Coventry University)
- 11:00 **1074 Electrodeposition of Aluminum Using Chloroaluminate Ionic Liquids Under Dry Air Conditions** – M. Miyake, M. Hirata, and T. Hirato (Kyoto University)
- 11:20 **1075 A Molten Salt Electrochemical Approach for the Synthesis of Graphite** – P. Bagri (Oak Ridge National Lab), H. Luo (Oak Ridge National Lab), and S. Dai (Oak Ridge National Laboratory)
- 11:40 **1076 Deposition of Dopamine Thin Film As an Adhesion Layer in Heterogeneous Interfaces for Metallization Process** – S. C. Chou, P. S. Hung, C. J. Wang, G. R. Wang, W. A. Chung, and P. W. Wu (National Chiao Tung University)

Industrial Electrochemistry and Electrochemical Engineering Division
Student Achievement Award Address – 14:00 – 14:40
Chair(s): Douglas P. Riemer and John A. Staser

14:00 1077 *(Industrial Electrochemistry and Electrochemical Engineering Division Student Achievement Award Address) Fundamental Understanding on Cell Performance Enhancement of Flow Batteries with Serpentine Flow Field Structures* – X. Ke, R. F. Savinell, and J. S. Wainright (Case Western Reserve University, Cleveland, Ohio, USA)

Industrial Electrochemistry and Electrochemical Engineering Division
General Session 2 – 14:40 – 16:40
Chair(s): Douglas P. Riemer and John A. Staser

14:40 1078 **A Novel Flow Electrochemical Reactor for Intensifying Diffusion-Limited Electrochemical Processes** – B. Bayatsarmadi, M. Horne, M. Chen, and T. Rodopoulos (CSIRO)

15:00 1079 **Developing a Physics-Based Model of the Electrocoating Process: Experimentation and Simulation** – T. Marlar (Dept. Chemical Engineering, Brigham Young University), F. Padash (Dept. of Chemical Engineering, Brigham Young University), A. Trainor (Dept. Chemical Engineering, Brigham Young University), W. Liu (Ford Motor Company), B. Okerberg, S. R. Zawacky (PPG Industries Inc.), and J. N. Harb (Dept. of Chemical Engineering, Brigham Young University)

15:20 **Break**

15:40 1080 **A Study of Dark TiO₂ Coating on Pure Titanium By Micro Arc Oxidation** – Y. F. Hong (Department of Materials Science and Engineering, NTU), H. Lee (Huang-Chieh Metal Composite Material Tech. Co.), and H. C. Lin (Department of Materials Science and Engineering, NTU)

16:00 1081 **High Temperature Oxidation Resistance of Cr Coatings on 22MnB5 Steel Electroplated in Trivalent Cr Baths** – C. Y. Huang and C. S. Lin (Department of Materials Science and Engineering, NTU)

16:20 1082 **Influence of ZrO₂ Incorporation into Coating on Electrochemical Response of Low-Carbon Steel Processed By Plasma Electrolytic Oxidation** – K. M. Lee (POSCO)

Lone Star B/C, Dallas Sheraton Convention Center

F01 Poster Session – 18:00 – 20:00

• 1083 **Impact of Manufacturing Tolerance on Lithium Ion Electrode and Cell Physical Properties** – W. Yourey (Penn State University, Hazleton)

• 1084 **Electrochemical Behavior and Extraction of Yttrium on Cu Electrode in LiCl-KCl Eutectic** – W. Li, W. Han, M. Li, X. Yang (Harbin engineering university), and Y. Sun (Harbin Engineering University)

• 1085 **Performance Comparison of the Electrolytic Cells Having Different Configurations for the Production of HCl and NaOH from NaCl** – J. Kim (Korea University, Korea Institute of Science and Technology), S. Abbas (Korea University of Science and Technology, Korea Institute of Science and Technology), K. B. Lee (Korea University), and H. Y. Ha (Korea Institute of Science and Technology, Korea University of Science and Technology)

• 1086 **Electrochemical Behavior of Nd and the Preparation of Mg-Al-Nd Alloys in LiCl-NaCl Molten Salt** – Y. Zhang, W. Han (Harbin Engineering University), M. Li, X. Yang (Harbin engineering university), and Y. Sun (Harbin Engineering University)

• 1087 **Electrochemical Co-Reduction of Ce (III) and Ga (III) and Preparation of the Intermetallic Compound in LiCl-KCl Eutectic** – D. Yang, W. Han (Harbin Engineering University), and M. Li (Harbin engineering university)

• 1088 **Electrochemical Behavior of Ga³⁺, NO₃⁻ and NH₄⁺ Ions and Electrodeposition of GaN in Aqueous Solutions** – J. Kang (Nagoya University), K. Kuroda, and M. Okido (IMaSS, Nagoya University)

• 1089 **Supercapacitor Prognosis for POWER Electronic Applications** – A. EL Mejdoubi (Université de Caen Normandie), J. Sabor (Université Moulay Ismail, Morocco), H. Chaoui (Carleton University, Ottawa, ON, Canada), and H. Gualous (Université de Caen Normandie)

F04 Multiscale Modeling, Simulation and Design 3: Enhancing Understanding, and Extracting Knowledge from Data

Industrial Electrochemistry and Electrochemical Engineering / Energy Technology
Pearl 4, Dallas Sheraton Hotel

Multiscale Modeling, Simulation and Design 3: Enhancing Understanding, and Extracting Knowledge from Data - Session 3 – 08:00 – 12:00

Chair(s): John N. Harb and Venkat R. Subramanian

08:00 1135 *(Invited)* **Hierarchy of Stochastic Scales in Intercalation Electrodes** – P. P. Mukherjee and A. N. Mistry (Purdue University)

08:40 1136 *(Invited)* **Modeling of Lithium Plating Induced By Heterogeneities at Varied Length-Scales in Lithium-Ion Batteries** – K. Smith, F. L. E. Usseglio-Viretta, A. M. Colclasure, W. Mai (National Renewable Energy Laboratory), A. N. Mistry, P. P. Mukherjee (Purdue University), S. Santhanagopalan, and M. Keyser (National Renewable Energy Laboratory)

09:20 **Break**

09:40 1137 *(Invited)* **Fully-Coupled 3D Electrochemical-Thermal Modeling of Cylindrical Lithium-Ion Batteries** – P. M. Gomadam (Medtronic Energy and Component Center)

10:20 1138 *(Invited)* **Exact and Approximate Methods for Analytical Modeling of Thermal and Electrochemical Transport in Li-Ion Batteries** – A. Jain (The University of Texas at Arlington)

- 11:00 1139 **(Invited) Ion Conduction in Glassy Electrolytes for Sodium Ion Batteries – an Atomistic Perspective** – A. M. Dive and S. Banerjee (Washington State University)
- 11:40 1140 **Linear Stability Analysis of Time-Dependent Electrodeposition in Charged Porous Media** – E. Khoo, H. Zhao, and M. Z. Bazant (Massachusetts Institute of Technology)

Multiscale Modeling, Simulation and Design 3: Enhancing Understanding, and Extracting Knowledge from Data - Session 4 – 14:00 – 17:40
Chair(s): Ankur Jain and John N. Harb

- 14:00 1141 **(Invited) Exploring Fuel Cell Catalyst Layers at Multiple Scales** – T. A. Zawodzinski Jr. (University of Tennessee-Knoxville), R. Subbaraman (Apple, Inc), C. N. Sun (Oak Ridge National Laboratory), and N. M. Cantillo (The University of Tennessee - Knoxville)
- 14:40 1142 **(Invited) Growth of Self-Ordered Anodic Oxide Nanomaterials By Coupled Ion Migration and Viscous Flow** – P. Mishra and K. Hebert (Iowa State University)
- 15:20 1143 **Multiscale Modeling of Multiphase Transport in PEM Water Electrolyzer** – J. Zhou (Lawrence Berkeley National Laboratory), H. Johansen (Lawrence Berkeley National Laboratory - CRD), N. Danilovic (Lawrence Berkeley National Laboratory), I. V. Zenyuk (University of California Irvine), and A. Z. Weber (Lawrence Berkeley National Laboratory)
- 15:40 **Break**
- 16:00 1144 **Numerical Modeling of Anode-Supported Solid Oxide Fuel Cell Using Openfoam** – D. H. Jeon (Dep. of Mechanical System Eng., Dongguk University), S. B. Lee, J. E. Hong, and R. H. Song (Korea Institute of Energy Research (KIER))
- 16:20 1145 **Prediction of Electrochemical Characteristics for Yttrium Doped Barium Zirconate Based Solid Oxide Fuel and Electrolyzer Cells Using a Multiscale Framework** – P. Priya, C. Zhang, and N. R. Aluru (University of Illinois at Urbana Champaign)
- 16:40 1146 **Water Oxidation and Surface Protonation of Small IrO_x Clusters** – G. Juhasz (Tokyo Institute of Technology)
- 17:00 1147 **(Invited) Intermediate Transport on Flexible Cascade Surfaces with Electrostatic Channeling** – Y. Liu and S. Calabrese Barton (Michigan State University)

Lone Star B/C, Dallas Sheraton Convention Center

F04 Poster Session – 18:00 – 20:00

- 1148 **Deep Learning for Defects Analysis and Atomic-resolution Imaging of Battery Materials** – M. Ragone (University of Illinois at Chicago)
- 1149 **Open-Circuit Voltage Anomalies in Yttria-Stabilized Zirconia and Samaria-Doped Ceria Bilayered Electrolytes** – T. Miyashita (Miyashita Clinic)

- 1150 **Combined Simulative and Experimental Multi-Scale Approach to Study the Microstructural Evolution of a Ni-Based SOFC Anode Under Operating Conditions** – A. Maruszczyk (Robert Bosch GmbH), P. Haremski (Karlsruhe Institute of Technology, Robert Bosch GmbH), P. W. Hoffrogge (Hochschule Karlsruhe), D. Schneider (Karlsruhe Institute of Technology, Hochschule Karlsruhe), B. Nestler (Hochschule Karlsruhe, Karlsruhe Institute of Technology), M. Wieler, and P. Lupetin (Robert Bosch GmbH)
- 1151 **Sensitivity Analysis Based on Monte Carlo Simulations of a 1D Accelerated Mechanistic Model of a Proton Exchange Membrane Fuel Cell** – V. Kannan (National University of Singapore, Cambridge CARES), A. C. Fisher (University of Cambridge, Cambridge CARES), and E. K. Birgersson (National University of Singapore, Cambridge CARES)



Silicon Compatible Emerging Materials, Processes, and Technologies for Advanced CMOS and Post-CMOS Applications 9

Electronics and Photonics / Dielectric Science and Technology
City View 2, Dallas Sheraton Hotel

2D Materials, Devices and Integration – 08:30 – 10:50
Chair(s): Stefan De Gendt and Kuniyuki Kakushima

- 08:30 1190 **(Invited) 2D Materials: Crystal Growth for Future Device Structures** – L. Colombo (University of Texas at Dallas)
- 09:10 1191 **(Invited) 2D Materials for Nanoelectronics: Prospects and Materials Integration Challenges** – R. M. Wallace (University of Texas at Dallas)
- 09:50 **Break**
- 10:10 1192 **(Invited) Two-Dimensional Materials for Electronic Devices: Transition-Metal Dichalcogenides and Topological Insulators** – W. Vandenberghe, A. Laturia, S. Tiwari (University of Texas at Dallas), B. Sorée (imec, KU Leuven), and M. Van de Put (University of Texas at Dallas)

MOL/BEOL Material and Process Technology – 10:50 – 12:10
Chair(s): Durgamadhab Misra and Yaw S. Obeng

- 10:50 1193 **Etch Damage Reduction of Ultra Low-k Dielectric By Using Pulsed Plasmas** – J. K. Jang (Advanced Materials Sci. and Eng., SungKyunKwan Univ., Foundry Division, Samsung Electronics), H. W. Tak, K. C. Yang, Y. J. Shin, and G. Y. Yeom (Advanced Materials Sci. and Eng., SungKyunKwan Univ.)
- 11:10 1194 **Capping Layer Effect on Lifetime of Plasma Etched Copper Lines** – M. Li, J. Q. Su, and Y. Kuo (Texas A&M University)
- 11:30 1195 **Void-Free Copper Electrodeposition in Full Wafer Thickness through-Silicon Vias with 10:1 Aspect Ratios** – R. P. Schmitt, L. A. Menk, E. D. Baca, and A. E. Hollowell (Sandia National Laboratories)

11:50 1196 **Nondestructive Methods for Characterizing Copper Electrofilled through Silicon Vias** – E. D. Baca (Sandia National Laboratories), G. Taggart, J. Romero (Sandia National Labs), R. P. Schmitt, L. A. Menk, and A. E. Hollowell (Sandia National Laboratories)

Technologies for Advanced Integrated Circuits 2 – 14:30 – 16:40

Chair(s): Kuniyuki Kakushima and Durgamadhab Misra

14:30 1197 **(Invited) Cavity-Free Micro Thermoelectric Energy Harvester with Si Nanowires** – T. Watanabe, M. Tomita, T. Zhan, K. Shima, Y. Himeda, R. Yamato (Waseda University), T. Matsukawa (National Institute of AIST), and T. Matsuki (National Institute of AIST, Waseda University)

15:10 1198 **Charge Pumping in Ultrathin SOI Tunnel FETs: Impact of Back-Gate Voltage** – C. Diaz Llorente (CEA-LETI, MINATEC Campus), C. G. Theodorou (IMEP-LAHC, INP MINATEC), J. P. Colinge (CEA-LETI, MINATEC Campus), S. Cristoloveanu (IMEP-LAHC, INP MINATEC), S. Martinie, C. Le Royer (CEA-LETI, MINATEC Campus), G. Ghibaudo (IMEP-LAHC, INP MINATEC), and M. Vinet (CEA-LETI, MINATEC Campus)

15:30 **Break**

16:00 1199 **Roles of Inner and Outer Fringe and Asymmetric Coupling Effect in Concentric Double-MIS(p) Tunneling Diodes** – Y. H. Chen and J. G. Hwu (National Taiwan University)

16:20 1200 **Effect of Silver Nanoparticles on the Electrical Characteristics of Oxide/Semiconductor Heterojunctions** – A. Rezk, Y. Abbas, I. Saadat, A. Nayfeh, and M. Rezeq (Khalifa University)

GO2 Processes at the Semiconductor Solution Interface 8

Electronics and Photonics / Dielectric Science and Technology / Electrodeposition / Physical and Analytical Electrochemistry
City View 3, Dallas Sheraton Hotel

Processes at the Semiconductor Solution Interface - Session 4 – 08:20 – 09:40

Chair(s): Philippe M. Vereecken and Robert P. Lynch

08:20 1219 **(Invited) Atomic-Scale Investigations of TiO₂ surfaces in Ambient and Solution Environments** – M. A. Hines (Cornell University)

09:00 1220 **Chemical and Electrochemical Regeneration of InP after GD-OES/XPS Profiling Experiments** – S. Bechu, D. Badrounine (Institut Photovoltaïque d'Ile de France, Institut Lavoisier de Versailles UMR8180 CNRS-UVSQ), A. Loubat (Institut Lavoisier de Versailles UMR8180 CNRS-UVSQ), C. Eypert, S. Gaiaschi (Horiba Jobin Yvon S.A.S.), D. Aureau, M. Frégnaux, J. Vigneron, A. M. Gonçalves, N. Simon (Institut Lavoisier de Versailles UMR8180 CNRS-UVSQ), P. Chapon (Horiba Jobin Yvon S.A.S.), M. Bouttemy, and A. Etcheberry (Institut Lavoisier de Versailles UMR8180 CNRS-UVSQ)

09:20 1221 **Study of Se and Ge Solutions at Different Phases to Form Gese Via E-ALD** – P. Howell and J. L. Stickney (University of Georgia)

Processes at the Semiconductor Solution Interface - Session 5 – 10:00 – 12:40

Chair(s): Colm O'Dwyer

10:00 1222 **(Invited) Analysis of Charge Transfer Reactions with Semiconductor Ultramicroelectrodes** – S. Maldonado (University of Michigan)

10:40 1223 **Emergent Growth of Semiconductor Nanopatterns Via Directed Illumination** – M. C. Meier, A. I. Carim, S. Yalamanchili, J. R. Thompson, H. A. Atwater, and N. S. Lewis (California Institute of Technology)

11:00 1224 **Modification of the Electrochemical Behavior of InP Electrodes Induced By Ionic Bombardment: The Case of the Response of the Ce⁴⁺/Ce³⁺ Couple** – D. Aureau, J. Vigneron, M. Bouttemy, M. Frégnaux, N. Simon, A. Etcheberry, and A. M. Gonçalves (Institut Lavoisier de Versailles UMR8180 CNRS-UVSQ)

11:20 1225 **(Invited) Ordered Mesoporous Metal Oxide Thin Films: From Room Temperature Ferroelectrics to Tunable Magnetic Materials** – T. Brezesinski (Institute of Nanotechnology, Karlsruhe Institute of Technology)

12:00 1226 **(Invited) Electron Dynamics at the CuWO₄/Electrocatalyst Interface for Photoelectrochemical Water Oxidation** – T. Hamann (Michigan State University)

Processes at the Semiconductor Solution Interface - Session 6 – 14:00 – 16:20

Chair(s): Andrew Campion Hillier and Robert P. Lynch

14:00 1227 **(Invited) Wet-Chemical Etching of III-V Semiconductors: Towards Atomic-Layer-Scale Processing** – D. H. van Dorp (imec, Belgium), S. Arnauts (Imec), J. Kelly (University Utrecht), and F. Holsteyns (imec)

14:40 1228 **SiN_x Deposition at Low Temperature Using UV-Irradiated NH₃** – Y. Shiba, A. Teramoto, T. Suwa (Tohoku University), K. Ishii, A. Shimizu, K. Umezawa (Tokyo Electron Technology Solutions Ltd.), R. Kuroda, and S. Sugawa (Tohoku University)

15:00 1229 **(Invited) Time Resolved Spectroscopy of Charge Carriers in TiO₂ Anatase and Rutile Single Crystals. Effect of Oxygen Defects and Electrons/Holes Scavengers** – K. Katsiev and H. Idriss (Catalysis Department, SABIC)

- 15:40 1230 **Nanoscale Wet Chemical Engineering of III-V Quantum Dots for Emerging Solar Applications** – M. Bouttemy, D. Aureau, M. Frégnaux (Institut Lavoisier de Versailles UMR8180 CNRS-UVSQ), Y. Shoji, Z. Jehl (RCAST, The University of Tokyo, Tokyo 153-8904, Japan), D. Suchet (Ecole Polytechnique, IPVF UMR 9006, Palaiseau, France.), J. F. Guillemoles (CNRS, IPVF UMR 9006, Palaiseau, France), A. Etcheberry (Institut Lavoisier de Versailles UMR8180 CNRS-UVSQ), and Y. Okada (RCAST, The University of Tokyo, Tokyo 153-8904, Japan)
- 16:00 1231 **Study of Electrodeposited High Entropy Single Element (HESE) Cu for Cu-Cu Direct Bonding** – C. Lee (Hanyang university), Y. Kim (Hanyang University), R. Kim (Hanyang university), J. Lee (Hanyang University), J. Kim (hanyang university), and B. Yoo (Hanyang university)

G03

Organic Semiconductor Materials, Devices, and Processing 7

Electronics and Photonics

City View 4, Dallas Sheraton Hotel

Processing Technologies – 08:30 – 10:00

Chair(s): Alexander Kloes

- 08:30 1245 **(Invited) Design and Fabrication of Organic Thin Film Transistors Using Solution-Processable Liquid Crystalline Phthalocyanine Derivatives** – A. K. Ray (Brunel University London)
- 09:00 1246 **(Invited) A Simple and Efficient Solution-Based Technique to Electrically Dope Organic Semiconductors** – F. A. Larrain, C. Fuentes-Hernandez, W. F. Chou, V. A. Rodriguez-Toro, and B. Kippelen (Georgia Institute of Technology)
- 09:30 1247 **(Invited) Laser Printed Organic Field-Effect Transistors on Paper** – O. D. Jurchescu (Wake Forest University)

Electronic and Biomedical Applications 1 – 10:30 – 12:00

Chair(s): Asim Kumar Ray

- 10:30 1248 **(Invited) Controlling Nanotube-Nanotube Interactions in Carbon Nanotube Networks: Implications for Energy Transport and Harvesting** – A. J. Ferguson and J. L. Blackburn (National Renewable Energy Laboratory)
- 11:00 1249 **(Invited) Device Variations of Artificial Neurons and Implications for Realizing Organic Electronic Neuromorphic Circuits** – L. E. Calvet (Centre de Nanosciences et Nanotechnologies (UMR 9001))
- 11:30 1250 **(Invited) Electrodeposited POLY(3,4-ETHYLENEDIOXYTHIOPHENE) (PEDOT) for Invasive Recording and Stimulating Neural Electrodes** – C. Bodart, N. Rossetti, and F. Cicoira (Polytechnique Montréal)

Electronic and Biomedical Applications 2 – 14:00 – 17:30

Chair(s): Asim Kumar Ray

- 14:00 1251 **(Invited) Polymer Resistive Electronic Memory: Exploiting Bistability of Current-Voltage Characteristics** – J. Pfleger, Y. R. Panthi, D. Rais, and D. Výprachtický (Institute of Macromolecular Chemistry CAS)
- 14:30 1235 **(Invited) Role of Domain Purity in Non-Fullerene Acceptor Based Organic Solar Cells** – S. Mukherjee and D. M. DeLongchamp (National Institute of Standards and Technology)
- 15:00 **Break**
- 15:20 1253 **(Invited) Printing Transistors Circuits: Interest of Organic Materials and Challenges** – M. Charbonneau, D. Locatelli, S. Lombard, C. Laugier, L. Tournon, K. Romanjek, A. Gaitis, R. Coppard, and C. Serbutoviez (CEA Liten)
- 15:50 1254 **(Invited) Enhancing the Performance of Polymer Thin-Film Transistors** – A. Dodabalapur, X. Wang, and K. Liang (The University of Texas at Austin)
- 16:20 1255 **(Invited) High-Frequency Operation of Vertical Organic Field-Effect Transistors** – H. Kleemann (Technische Universität Dresden, Institut für Angewandte Photophysik)
- 16:50 1256 **(Invited) Recent Developments in Contact-Controlled Transistors** – R. A. Sporea (University of Surrey)

Lone Star B/C, Dallas Sheraton Convention Center

G03 Poster Session – 18:00 – 20:00

- 1257 **Trap-Free Charge Transport Approaches in Polymer Thin Film Transistors** – C. M. McCulley and A. Dodabalapur (The University of Texas at Austin)
- 1258 **Transient Response and Charge Transport in Organic and Polymer Thin-Film Transistors** – O. Krutko and A. Dodabalapur (The University of Texas at Austin)
- 1259 **Effects of Doping States of Polyaniline Thin Films on Their Photo-Responsive Properties** – J. Choi (Sahmyook University)

H01

Wide Bandgap Semiconductor Materials and Devices 20

Electronics and Photonics

Austin Ballroom 1, Dallas Sheraton Hotel

II-VI and III-V Epitaxy and Process – 09:00 – 11:40

Chair(s): Vidhya Chakrapani and Erica A. Douglas

- 09:00 1290 **(Invited) Phonon Heat Transport Processes and Thermal Conductivity of II-Oxide and III-V Superlattices: Wave-like Coherent Transport in CaTiO₃/SrTiO₃ Superlattices and Ballistic-Diffusive Transport in GaAs/Alas Superlattices** – P. Hopkins (University of Virginia, Charlottesville)
- 09:30 1291 **Effect of Proton Irradiation on Breakdown Field of Hexagonal Boron Nitride** – D. Lee, H. Park, J. Bae, and J. Kim (Korea University)

- 09:50 **1292 Remote Epitaxy of ZnO Microrods on Graphene-Coated Substrates** – J. Jeong, S. Hong, and Y. J. Hong (Sejong University)
- 10:10 **Break**
- 10:30 **1293 (Invited) Enabling 5nm and Beyond Device Fabrication with New Etch Technologies** – A. Ranjan (TEL Technology Center, America LLC) and P. Ventzek (Tokyo Electron America Inc.)
- 11:00 **1294 Minority Carrier Lifetime Extraction Methodology of SiC Epitaxial Layer** – K. Sasaki, J. Song, T. Hoshii, H. Wakabayashi, K. Tsutsui (Tokyo Institute of Technology), I. Mizushima, T. Yoda (NuFlare Technology, Inc., Tokyo Institute of Technology), and K. Kakushima (Tokyo Institute of Technology)
- 11:20 **1295 Stability and Electronic Properties of Silicon-Rich Silicon Carbide Structures** – N. D. Alkhaldi, S. K. Barman (The University of Texas at Arlington), and M. N. Huda (University of Texas at Arlington,)

H02 Solid-state Electronics and Photonics in Biology and Medicine 6

Electronics and Photonics / Sensor
Austin Ballroom 2, Dallas Sheraton Hotel

Emerging Sensing and Diagnostic Systems 1 – 08:00 – 12:10 Chair(s): Yu-Cheng Chen and Do Hwan Kim

- 08:00 **1334 (Invited) nanopore-Nanoelectrode Multifunctional Nanopipette for Single Entity and Single Cell Analysis and Imaging** – J. He (Florida International University)
- 08:30 **1335 (Invited) Cell-Devices Interface: From Single Cell to 3D Tissue Analysis** – C. Z. Li (Florida International University)
- 09:00 **1336 (Invited) optically Controlled Nanowired Biointerfaces** – B. Tian (the University of Chicago)
- 09:30 **Break**
- 09:40 **1337 (Invited) Nanoporous Titanium Nitride Electrodes for Neural Probes** – M. M. C. Cheng (Wayne State University)
- 10:10 **1338 (Invited) Optical Detection of Streptavidin-Biotin Binding on Nanoporous Anodic Alumina Pore Surface** – L. Pol, J. Ferré-Borrull, E. Xifré-Pérez, J. Pallares, and L. F. Marsal (Universitat Rovira i Virgili)
- 10:40 **1339 (Invited) Surface Plasmon Resonance-Based Biosensing and Precision Medicine** – N. Wu (West Virginia University)
- 11:10 **1340 An in-Situ Impedance-Based Whole Blood Anticoagulation Diagnosis Technology** – Y. C. Huang, J. S. Jheng (Graduate Institute of Electronics Engineering, National Taiwan University), K. H. Chiang (Grad. Inst. of Biomedical Electronics and Bioinformatics, National Taiwan University), and C. T. Lin (National Taiwan University, Grad. Inst. of Biomedical Electronics & Bioinformatics)
- 11:30 **1341 Highly Sensitive Solid-Liquid Interfacing Triboelectric Nanosensor for Self-Powered Mercury Ion Detection** – S. W. Chen, Y. J. Lin, and Z. H. Lin (National Tsing Hua University)

- 11:50 **1342 An Ion-Sensitive Field-Effect Transistor with Three-Dimensional Extended-Gate Architecture** – N. Y. Teng (Graduate Institute of Electronics Engineering, National Taiwan University), G. Y. Chen (Grad. Inst. of Biomedical Electronics & Bioinformatics, National Taiwan University), R. X. Wang, and C. T. Lin (Graduate Institute of Electronics Engineering, National Taiwan University)

Emerging Sensing and Diagnostic Systems 2 – 13:30 – 18:00 Chair(s): Chih-Ting Lin and Jin He

- 13:30 **1343 (Invited) visco-Poroelastic & Iontronic Pump: New Strategy for Ultrasensitive Artificial Skin Sensors** – D. H. Kim (Hanyang University)
- 14:00 **1344 (Invited) Design Integrated Microfluidic Chips for *in Vitro* Diagnosis** – B. R. Li (National Chiao Tung University)
- 14:30 **1345 (Invited) Optically Innervated Surgical Sensing for Situation-Aware Surgeries** – H. Ren (e52242728)
- 15:00 **1346 (Invited) Bio-Lasers: An Emerging Field Bridging Laser Photonics and Biomedicine** – Y. C. Chen (Nanyang Technological University, Singapore)
- 15:30 **Break**
- 15:50 **1347 (Invited) Flexible Nanogenerators for Energy Harvesting and Self-Powered Biomedical Devices** – Y. Xie (Nanjing University of Posts and Telecommunications)
- 16:20 **1348 High Efficient Bi₂Te₃ Thermalcatalyst for Environmental Disinfection** – S. W. Chan, Y. J. Lin, and Z. H. Lin (National Tsing Hua University)
- 16:40 **1349 Adaptation of SERS-Active Materials to Analysis of Certain Molecules By Electroless Corrosive Deposition of Coinage Metals on Silicon Nanostructures** – N. Khinevich, S. Zavatski, and H. Bandarenka (BSUIR)
- 17:00 **1350 Formation of Platinum Nanocrystals on Silicon Nanotubes and *In Vitro* Anti-Cancer Activity of the Composites** – N. T. Le (Texas Christian University), G. R. Akkaraju, and J. L. Coffey (Texas Christian University)
- 17:20 **1351 Improvement in Sensitivity of InN Resitive Gas Sensor By Thickness Modulation for Liver Malfunction Application** – A. Agarwal, S. Kumar Rai, K. Avinash, and J. A. Yeh (National Tsing Hua University)
- 17:40 **1352 Ultrafast InAs Quantum Dot Scintillation Detector** – K. Dropiewski, A. Minns, M. Yakimov, V. Tokranov (SUNY Polytechnic Institute), P. Murat (Fermi National Accelerator Laboratory), and S. Oktyabrsky (SUNY Polytechnic Institute)

H03**Wearable and Flexible Electronic and Photonic Technologies 2**

Electronics and Photonics / Dielectric Science and Technology / Physical and Analytical Electrochemistry / Sensor / Interdisciplinary Science and Technology Subcommittee
Austin Ballroom 3, Dallas Sheraton Hotel

Wearable and Flexible Electronic and Photonic Technologies -**Session 4 – 08:10 – 09:30****Chair(s): Colm O'Dwyer**

- 08:10 1367 **(Invited) Two-Dimensional Material Derived Supercapacitor Yarns As Weaveable Energy-Storage Units** – W. Gao (North Carolina State University)
- 08:50 1368 **(Invited) Silicon Nanomembrane-Based Flexible Photodetector and Sensors** – G. Li, Q. Guo, E. Song, G. Huang, and Y. Mei (Fudan University)

Wearable and Flexible Electronic and Photonic Technologies -**Session 5 – 10:00 – 12:20****Chair(s): Wei Gao and Durgamadhab Misra**

- 10:00 1369 **Flexible, Stretchable and Healable Electronics** – F. Cicoira (Polytechnique Montréal)
- 10:40 1370 **(Invited) Molecular Sensors for Human Performance Monitoring and Protection** – M. Brothers (711th Human Performance Wing, AFRL), D. Sim (Air Force Research Laboratory, National Research Council Research Associate Program), A. Islam, J. Slocik (Air Force Research Laboratory, UES Inc), B. Maruyama, M. Rubenstein, R. Naik, and S. Kim (Air Force Research Laboratory)
- 11:20 1371 **Solar Powered Monitoring System Development for Smart Farming and Internet of Thing Applications** – W. Y. Chung, R. H. Luo, C. L. Chen, S. Heythem, C. F. Chang, and C. C. Po (Chung-Yuan Christian University)
- 11:40 1372 **When Stretchable Sensing Meet Flexible Robotics** – H. Ren (National University of Singapore)
- 12:00 1373 **High Efficiency Multi-Level Flexible Triboelectric Nanogenerator for Wearable Electronics** – A. Ravichandran, M. Ramuz, and S. Blayac (EMSE-CMP)

Wearable and Flexible Electronic and Photonic Technologies -**Session 6 – 14:00 – 17:20****Chair(s): Colm O'Dwyer**

- 14:00 1374 **(Invited) Point-of-Use Flexible Sensors for Health and Environmental Applications: Assessment of Motor Skills and Chemical Exposure** – M. Amit (University of California San Diego), R. Mishra (UC San Diego), J. Wang, and T. N. Ng (University of California San Diego)
- 14:40 1375 **(Invited) Hybridized Electronics for Wearable Healthcare: From the Skin to below the Skin** – S. Xu (University of California, San Diego)

- 15:20 1376 **(Invited) Stretchable Conductive Nanocomposite for Soft Bioelectronics** – D. H. Kim (Seoul National University)
- 16:00 1377 **(Invited) Characterization of Mxene/Graphene Supercapacitor Yarns Using Time and Frequency Models** – J. Mainka (LEMETA, CNRS, Université de Lorraine), W. Gao, N. He (North Carolina State University), A. Caillon, Q. Liu, S. Théniaux-Vignon (LEMETA, CNRS, Université de Lorraine, École Nationale Supérieure des Mines Nancy ENSMN), J. Dillet, and O. Lottin (LEMETA, CNRS, Université de Lorraine)
- 16:40 1378 **(Invited) Multifunctional Mxene-Based Fibres** – J. Razal (Deakin University)

I01**Hydrogen or Oxygen Evolution Catalysis for Water Electrolysis 5**

Energy Technology / Industrial Electrochemistry and Electrochemical Engineering / Physical and Analytical Electrochemistry
State Room 2, Dallas Sheraton Convention Center

PEM Electrolysis 1 – 08:00 – 12:20**Chair(s): Marcelo Carmo, Feng-Yuan Zhang and Peter N. Pintauro**

- 08:00 **Welcoming Remarks**
- 08:05 1427 **(Invited) Degradation Aspects of Electrocatalysts and Materials in PEM Water Electrolyzers** – M. Carmo (Forschungszentrum Juelich GmbH)
- 08:35 1428 **Influence of A-Site Cations on Performance of A₂Ir₂O₇ Pyrochlore Oxygen Evolution Catalysts in Acidic Condition** – M. A. Hubert, L. A. King, A. M. Patel (Stanford University), M. Bajdich (SLAC National Accelerator Laboratory), and T. F. Jaramillo (Stanford University, SLAC National Accelerator Laboratory)
- 08:55 1429 **Structure-Activity Data Mining for Hydrogen Evolution Reaction at Organic Molecular Electrocatalysts** – X. Yin, E. F. Holby, and P. Zelenay (Los Alamos National Laboratory)
- 09:15 1430 **Highly Ordered 1-D IrO₂ Electrode Synthesized with Titanium Oxide Nanotube Array for OER** – C. Yan (Guangzhou Institute of Energy Conversion), Z. Lu, Y. Shi (Guangzhou Institute of Energy Conversion, CAS), Z. Wang (Guangzhou Institute of Energy Conversion), C. Guo, and H. Tan (Guangzhou Institute of Energy Conversion, CAS)
- 09:35 **Break**
- 09:50 1431 **(Invited) Developing Thin and Tunable Catalyst-Coated Liquid/Gas Diffusion Layers with Ultralow Catalyst Loadings** – F. Y. Zhang (UT Space Institute, University of Tennessee, Knoxville)
- 10:20 1432 **Synthesis and Evaluation of Novel Iridium Ruthenium Oxide Catalysts Supported on Reduced Graphene Oxide for Oxygen Evolution Reaction** – M. Hara, P. Joshi, H. H. Huang, and M. Yoshimura (Toyota Technological Institute)

- 10:40 1433 **TiO₂-MoO_x-Supported Iridium As Electrocatalysts for the Oxygen Evolution Reaction in PEM Based Electrolysis** – E. J. Kim (Korea Advanced Institute of Science and Technology), J. Shin (University of California, San Diego), and E. Cho (KAIST)
- 11:00 1434 **Ultra-Low Noble Metal Containing One-Dimensional Nanorods: High Performance Oer Electrocatalyst for Acid Mediated PEM Based Water Electrolysis** – S. D. Ghadge (Dept. of Chemical Engineering, University of Pittsburgh), O. I. Velikokhatnyi, M. K. Datta, and P. N. Kumta (University of Pittsburgh)
- 11:20 1435 **Electroless Deposited IrO_x Nanoparticles for Ni Foam Functionalization with Low Iridium Loading** – R. G. Milazzo (CNR IMM), S. M. S. Privitera, S. Scalese (CNR-IMM), F. Monforte (CNR-IMM, Università di Catania), G. G. Condorelli (Università di Catania), and S. Lombardo (CNR-IMM)
- 11:40 1436 **Highly Efficient Hydrogen Evolution of Platinum Via Tuning Interfacial Dissolved-Gas Concentration** – L. Luo, X. Zhao, and R. Ranaweera (Wayne State University)
- 12:00 1437 **Highly Conductive Catalyst with Advanced Manufacturing for Efficient Oxygen Evolution Reaction** – G. Yang (University of Tennessee Space Institute), S. Yu, Y. Li (UT), Z. Kang (NREL), G. Bender, B. S. Pivovar (National Renewable Energy Laboratory), J. Green (NREL), D. A. Cullen (Oak Ridge National Laboratory), and F. Y. Zhang (UT Space Institute, University of Tennessee, Knoxville)
- 15:20 1442 **Iridium-Based Catalysts for Acidic Water Splitting: Oxygen Evolution and Dissolution Mechanisms** – S. Cherevko (Forschungszentrum Jülich GmbH), K. Mayrhofer (Helmholtz-Institute Erlangen-Nürnberg), O. Kasian, and S. Geiger (Max-Planck-Institut für Eisenforschung GmbH)
- 15:40 **Break**
- 15:50 1443 **(Invited) PGM-Free Oer Catalysts for PEM Electrolyzer Application** – L. Chong, H. Wang (Argonne National Lab), and D. J. Liu (Argonne National Laboratory)
- 16:20 1444 **Mechanistic Investigation with Kinetic Parameters on Water Oxidationcatalyzed By Manganese Oxide Nanoparticle Film** – H. Seo, K. Jin, S. Park, K. H. Cho, K. G. Lee (Seoul National University), Đ. T. Nguyen, J. S. Lee (Chonnam National University), and K. T. Nam (Seoul National University)
- 16:40 1445 **Direct Visualization of Ultra-Fast and Micro-Scale Bubble Evolutions and Electrochemical Reactions in Proton Exchange Membrane Electrolyzer Cells** – Y. Li, S. Yu, G. Yang (University of Tennessee Space Institute), D. A. Talley (University of Tennessee), and F. Y. Zhang (UT Space Institute, University of Tennessee, Knoxville)
- 17:00 1446 **Graphene-Dot Wrapped PtMo Nanosponge As a Highly Efficient Electrocatalyst for Hydrogen Evolution Reactions in Both Acidic and Alkaline Media** – V. T. Nguyen, N. A. Nguyen, Y. Ali, and H. S. Choi (Chungnam National University)
- 17:20 1447 **Ir/TiC/Pt Vs. Pt-Ir/TiC in Role of Magnetron Sputtered Thin-Film Catalyst for Anode of PEM Reversible Fuel Cell** – P. Kúš, A. Ostroverkh (Charles University), I. Khalakhan (Charles Univeristy), R. Fiala (Central European Research Infrastructure Consortium, Charles University), Y. Kosto, B. Šmíd, Y. Lobko, Y. Yakovlev, J. Nováková, I. Matolínová, and V. Matolín (Charles University)
- PEM Electrolysis 2 – 13:45 – 17:40
Chair(s): Yu Huang, Di-Jia Liu and Sanjeev Mukerjee
- 13:45 **Introductory Remarks**
- 13:50 1438 **(Invited) Surface Engineered Ptm-O Alloy for High Hydrogen Evolution Reaction Rate at Low Overpotential** – Y. Huang (University of California, Los Angeles)
- 14:20 1439 **Optimization By Experimental Design of the Synthesis of Ru_xIr_{1-x}O₂ Electrocatalysts for the Oxygen Evolution Reaction in a PEM-URFC** – C. Lamy (Institut Européen des Membranes, CNRS, Univ Montpellier), B. Guenot (IEM/CNRS), T. Audichon (CEA), S. Baranton, and C. Coutanceau (Université de Poitiers, IC2MP, UMR CNRS 7285)
- 14:40 1440 **Investigation of New Pt Alloy Catalyst with Rare Earth Elements for Hydrogen Evolution Reaction** – C. K. Baik, S. W. Lee (Gwangju Institute of Science and Technology), M. S. Kim, G. S. Chai (Radiation Technology eXcellence (RTX)), and C. Pak (Gwangju Institute of Science and Technology)
- 15:00 1441 **Iridium and Iridium Oxide Performance in Electrolysis and Resolving Half- and Single-Cell Test Differences** – S. M. Alia, M. A. Ha, G. C. Anderson (National Renewable Energy Laboratory), C. Ngo, S. Pylypenko (Colorado School of Mines), and R. E. Larsen (National Renewable Energy Laboratory)
- Lone Star B/C, Dallas Sheraton Convention Center
- I01 Poster Session – 18:00 – 20:00
Chair(s): Nemanja Danilovic and Hui Xu
- 1448 **MoS₂/NiS₂ Composites for Efficient Hydrogen Evolution Both in Acidic and Alkaline Media** – J. Hu and C. Zhang (Kunming University of Science and Technology)
 - 1449 **A Highly Active and Stable Electrocatalyst Based on Nicos Nano-Flower Structure for Hydrogen Evolution Reaction** – Y. Ali, V. T. Nguyen, N. A. Nguyen, and H. S. Choi (Chungnam National University)
 - 1450 **Plasma-Treated Niau Nanosponge As an Efficient Electrocatalyst for Hydrogen Evolution Reaction** – N. A. Nguyen, V. T. Nguyen, Y. Ali, and H. S. Choi (Chungnam National University)
 - 1451 **Surface Ligand Effects on Ni-Fe-Based Nanocatalysts for Oxygen Evolution Reaction** – R. Manso, P. Acharya, L. F. Greenlee, and J. Chen (University of Arkansas)

- 1452 **Development of Supported Iridium Oxides As the Low Noble Metal Loading Anode for PEM Water Electrolyser** – Y. Shi, Z. Lu, H. Tan, C. Guo (Guangzhou Institute of Energy Conversion, CAS), Z. Wang, and C. Yan (Guangzhou Institute of Energy Conversion) 08:40 1534 **Investigation on the Impact of Carbon Porosity in the Microporous Layer of PEM Fuel Cells** – R. Govindarajan, J. Payoyo, and D. P. Wilkinson (University of British Columbia)
- 1453 **Preparation of Sb-Doped SnO₂ Nanoparticle with High Surface Area for Use As a Stable Anode Catalyst Support for PEM Electrolyzers.** – X. Zhou (Tongji University School of Automotive Studies), B. Li (School of Automotive Studies), D. Yang (Clean Energy Automotive Engineering Center), H. Lv, and C. Zhang (School of Automotive Studies) 09:00 1535 **Visualization of Liquid Water in a Metal Foam Flow-Field Based Polymer Electrolyte Fuel Cell Via Neutron Radiography** – Y. WU, D. J. L. Brett (University College London), and P. R. Shearing (Electrochemical Innovation Lab, UCL, London)
- 1454 **Bifunctional Transition Metal Oxide-Based Oxygen Electrode Catalysts for Unitized Reversible Fuel Cells** – S. R. Choi, S. Lee, and J. Y. Park (Sejong University) 09:20 1536 **Parametric Study of Fabrication Conditions for High-Performance Gas-Diffusion-Electrode-Based Membrane-Electrode Assemblies** – M. Wang, A. C. Yang-Neyerlin, K. C. Neyerlin, J. Pfeilsticker (National Renewable Energy Laboratory), S. Medina (Colorado School of Mines), C. Stetson (National Renewable Energy Laboratory), S. Pylypenko (Colorado School of Mines), M. Ulsh, and S. A. Mauger (National Renewable Energy Laboratory)
- 1455 **Study the Activity of a Novel Ni-Based Electrocatalyst for Oxygen Evolution Reaction in Alkaline Media** – R. Ghahremani and J. A. Staser (Ohio University) 09:40 **Break**
- 1456 **3D Micro Porous Cobalt–Iron–Phosphorus Electrocatalyst for Overall Water Splitting** – H. Kim (KAIST), S. Oh (Korea Advanced Institute of Science and Technology), E. Cho (KAIST), and H. Kwon (Korea Advanced Institute of Science and Technology) 10:00 1537 **Preparation of Platinum Nanostructures Directly Grown on Microporous Layer By an Electrodeposition Technique for a Commercial-Scale PEMFC** – C. H. Chiang, M. Y. Wang, and T. K. Yeh (National Tsing Hua University)
- 1457 **One-Step Electrodeposition Synthesized High Performance Quarternary Ni-Co-S-P for Efficient Water-Splitting** – Y. Tian, J. Yu, Z. Lin, and J. Wang (Harbin Engineering University) 10:20 1538 **Two-Phase Flow Characterization in PEM Fuel Cells Using Machine Learning** – A. D. Santamaria, M. Mortazavi, V. Chauhan, and J. Benner (Western New England University)
- 1458 **Composite of Nickel Oxide Hexagonal Sheet Supported on Carbon Nitride for Photo-Electrochemical Water Splitting** – P. Chaudhary and P. P. Ingole (Indian Institute of Technology Delhi) 10:40 1539 **Oxygen Transport Resistance in PEMFC Catalyst Layer Based on Ultra-Micro Electrode (UME) Theory** – Z. Lu, J. Yang, C. Xu, C. Wang, and J. Waldecker (Ford Motor Company)
- 1459 **Three-Dimensional CoS₂-MoS₂ Hetero-Nanosheets Architecture from Polyoxometalate for Highly Efficient Electrocatalytic Hydrogen Evolution** – J. Lei, G. G. Bizuneh, M. Zheng, and Q. Dong (Xiamen University) 11:00 1540 **Electrolyzer Components and Coatings: Methods for *Ex-Situ* Accelerated Stress Testing** – W. Callahan, T. Guerrero, E. Klein, J. C. Vidal, G. Bender, and J. L. Young (National Renewable Energy Laboratory)

102 Materials for Low Temperature Electrochemical Systems 5

Energy Technology / Physical and Analytical Electrochemistry
Houston Ballroom B, Dallas Sheraton Convention Center

Fuel Cell Performance and Characterization 4 – 08:00 – 12:20

Chair(s): James L. Young and Swami Kumaraguru

- 08:00 1532 **Polarization Analysis of Durable Low Loading Pt/C Electrodes Produced By Reactive Spray Deposition Technology for Low Humidity Conditions** – R. J. Ouimet, H. Yu, L. J. Bonville, and R. Maric (University of Connecticut) 11:40 1542 **Impact of Surface Functionalization of Pt/Graphitized Carbon on Catalyst Layer Structure and PEMFC Performance** – A. Z. Taning (Korea Institute of Energy Research (KIER), University of Science and Technology (UST)), S. Woo, S. H. Park (Korea Institute of Energy Research (KIER)), and S. D. Yim (Korea Institute of Energy Research (KIER), University of Science and Technology (UST))
- 08:20 1533 **Study and Modeling of PEM Fuel Cell Using Electrochemical Impedance Spectroscopy** – V. Konduru (General Motors Company), S. Arisetty (General Motors Company, Global Fuel Cell Activities), and S. Kumaraguru (General Motors Company)

12:00 1543 **Electrocatalyst Evaluation of 3D Printed Microfluidic Membraneless Glucose Biofuel Cell with Integrated Pencil Graphite Electrodes** – M. Bandapati (Birla Institute of Technology and Science, Pilani), P. Rewatkar (Birla Institute of Science and Technology Pilani), B. Krishnamurthy, and S. Goel (Birla Institute of Technology and Science Pilani)

General Electrocatalysis 5 – 14:00 – 18:00

Chair(s): Raphaël Chattot and Yoshiharu Uchimoto

14:00 1544 **(Invited) Promoting Surface Distortion for Improved Fuel Cell Electrocatalysis** – R. Chattot (CNRS, LEPMI, F-38000 Grenoble, France, ESRF, ID31 Beamline, 38043 Grenoble, France), L. Dubau, and F. Maillard (CNRS, LEPMI, F-38000 Grenoble, France)

14:40 1545 **Activity and Durability of Organic Ligands Modified Platinum Catalyst for Oxygen Reduction Reaction** – Y. Ikehata (Toyota Motor Corporation)

15:00 1546 **Intrinsic Strain Tuning of Electrocatalyst for Oxygen Reduction Reaction** – G. Liu (School of Physics and Electronics, Hunan University), Z. Zeng (School of Chemical Engineering, Purdue University), H. Deng (Hunan University), and J. Greeley (Purdue University)

15:20 1547 **High-Index Faceted Platinum Nanoflowers Catalysts for Proton Exchange Membrane Fuel Cell** – A. Abdelhafiz (Georgia Institute of Technology) and M. Liu (School of Materials Science and Engineering, Georgia Tech)

15:40 1548 **Electrocatalytic Activities and Stabilities of Selenium Based Cobalt-Nickel Binary and Ternary Chalcogenides** – J. Liu, J. Zheng, Q. Gong, T. Zhang, and X. Cheng (Xiamen University)

16:00 1549 **Investigation of Pt-Nb-NbO_x Loaded on TiN As Cost-Effective Electrocatalyst for Polymer Electrolyte Membranes Fuel Cell** – N. F. Daudt (Universidade Federal de Santa Maria), A. Poozhikunnath (Center for Clean Energy Engineering), H. Yu, L. J. Bonville (University of Connecticut), and R. Maric (Center for Clean Energy Engineering)

16:20 1550 **Electrochemical Synthesis of Cu-Cu₂O Composite Layers and Its Catalytic Properties Towards Ethylene Generation** – K. Mech, M. Bisztyga-Szklarz, and K. Szacilowski (AGH University of Science and Technology)

16:40 1551 **Effect of the Specific Adsorption of Sulfonate Group in Ionomer and Adsorbed Oxide Species on the Oxygen Reduction Reaction Activity of PEFC Catalyst** – Y. Wang, K. Yamamoto (Kyoto University), T. Uchiyama (Human and Environmental Studies, Kyoto University), N. Takao (Device-functional analysis Department, NISSAN ARC, Ltd.), H. Imai (Device Analysis Department, NISSAN ARC, Ltd.), K. Yokoyama, S. Sugawara (FC-Cubic Technology Research Association), K. Shinohara (Fuel Cell Cutting-edge Research Center (FC-Cubic)), and Y. Uchimoto (Kyoto University)

17:00 1552 **Vibrating Powders: Eqcm Measurement of Potential Dependent IrO₂ Mass Changes for Voltage Reversal Tolerant PEMFC Anodes** – C. E. Moore (University of British Columbia), F. Afsahi, A. P. Young, S. Knights (Ballard Power Systems), and E. L. Gyenge (University of British Columbia)

17:20 1553 **Oxygen Reduction Reaction, Catalyst Development** – S. Siahrostami (University of Calgary)

17:40 1554 **The Interparticle Distance Effect on Transient Platinum Dissolution: Degradation at High and Low Loadings** – D. J. S. Sandbeck (Forschungszentrum Jülich, Friedrich-Alexander-Universität Erlangen-Nürnberg), M. Inaba (University of Copenhagen), J. Bucher, A. Zana (University of Bern), M. Arenz (University of Bern, University of Copenhagen), and S. Cherevko (Forschungszentrum Jülich GmbH)

Lone Star B/C, Dallas Sheraton Convention Center

102 Poster Session – 18:00 – 20:00

• 1555 **MOF-Derived Alloy Nanoparticles for Highly Durable Fuel Cell Electrocatalysts** – J. M. Yoo, D. Y. Chung, C. Y. Ahn (Seoul National University (SNU), Institute for Basic Science (IBS)), and Y. E. Sung (Institute for Basic Science (IBS), Seoul National University (SNU))

• 1556 **Investigation of Hydrazine Electro-Oxidation on Zinc-Cobalt Coating Modified with Gold Nanoparticles** – D. Šimkūnaitė, A. Zabielaite, A. Balčiūnaitė, J. Vaičiūnienė, A. Selskis (Center for Physical Sciences and Technology), R. Vaitkus (Center for Physical Sciences and Technology, Vilnius University), L. Tamašauskaitė-Tamašiūnaitė, and E. Norkus (Center for Physical Sciences and Technology)

• 1557 **Hydrogen Oxidation Reaction on Metal@Pt Core-Shell Catalysts in Alkaline Electrolyte** – J. Hu and C. Zhang (Kunming University of Science and Technology)

• 1558 **Application of Platinum Nanoparticles Decorated Needle-Shaped Cobalt for Methanol and Ethanol Oxidation** – E. Norkus, A. Zabielaite, D. Šimkūnaitė, J. Vaičiūnienė, V. Pakštas, and L. Tamašauskaitė-Tamašiūnaitė (Center for Physical Sciences and Technology)

• 1559 **Development of New Electrocatalytic Nanomaterials for the Oxidation of Ammonia As Anodic Materials in a Direct Ammonia Fuel Cell** – E. Saab, M. Asteazaran, G. Cespedes, and A. M. Castro Luna (Universidad Tecnológica Nacional - UTN-FRLP)

• 1560 **Temperature Effect on Hydrogen Underpotential Deposition for Pt/C** – D. Takimoto, S. Hideshima, and W. Sugimoto (Shinshu University)

• 1561 **Super-Strong Nafion/PVA/Uhmwpe Membranes for Proton and Hydroxide Ion-Exchange Fuel Cells** – J. Li, Q. Zhang, R. Li, and P. Gao (The Hong Kong University of Science and Technology)

- 1562 **The Influence of Catalyst Ink on the Urea Oxidation Reaction Activity Evaluated in a Three-Electrode System** – N. Kakati (University of California Merced) and P. Y. A. Chuang (University of California, Merced)
- 1563 **Effect of NH₃ Etching on Fe-N-C Catalyst for Oxygen Reduction Reaction in Direct Methanol Fuel Cell** – Z. Luo, C. Hou, X. Zhang, Y. Zhang, and X. Liu (Harbin Institute of Technology)
- 1564 **Electrochemical and Ultra-Small Angle X-Ray Scattering Study of Ionomer Adsorption on Catalytic Sites in PEFC Electrodes** – A. A. Farghaly, N. N. Kariuki, J. Park, and D. J. Myers (Argonne National Laboratory)
- 1565 **Fuel Cell Catalysts Encased in 1D and 3D Porous Frameworks** – A. A. Farghaly, N. N. Kariuki, and D. J. Myers (Argonne National Laboratory)
- 1566 **Reduced Graphene Oxide / Polyaniline (rGO/PANI) Composite As Pt Support for Oxygen Reduction Reaction: Effect of PANI Content** – N. M. Sánchez-Padilla, V. Méndez, S. Fernández Tavizón, R. Benavides, and D. Morales-Acosta (Centro de Investigación en Química Aplicada)
- 1567 **Growth and Annealing Properties of Carbon Nanofibers on Carbon Black By Using Chemical Vapour Deposition** – J. D. Kim, T. Nishimura, and H. Nakao (National Institute for Materials Science (NIMS))
- 1568 **Ultra-Stable Imidazolium-Based Anion Exchange Membranes for Alkaline Fuel Cell Applications** – H. Lyu, J. L. Shih, J. P. Melchior, V. D. P. N. Nziko, I. Popovs, R. Custelcean, X. G. Sun, V. Bryantsev, and S. Jansone-Popova (Oak Ridge National Laboratory)
- 1644 **Photoreactions with CO/CO₂ Promoted By Hot Electrons in Plasmonic Metastructures** – L. Chang, W. Wang, Z. Wang, and A. Govorov (Institute of Fundamental and Frontier Science)
- 1645 **Fabrication of Photocatalytic Active Zinc Oxide Thin Films By Atomic Layer Deposition** – G. D. Han, J. S. Park, H. J. Choi, and J. H. Shim (Korea University)
- 1646 **SnO_x Nanosheets Anchored on Mwcnts Modified with Different Functional Groups for Selective Electrochemical Reduction of CO₂ to C1 Products** – Q. Zhang and J. Qiao (Donghua University)
- 1647 **Electrochemical Production of Formic Acid / Formate By CO₂ Electrolysis Using High Performance Gas Diffusion Electrodes** – A. Löwe (University of Stuttgart), D. Kopljar, F. Bienen (German Aerospace Center), N. Wagner (German Aerospace Center, DLR), and E. Klemm (University of Stuttgart)
- 1648 **Rapid One-Pot Synthesis of A- and B-Cu₂V₂O₇ and Their Use in Photoelectrochemical Water Splitting** – M. K. Hossain (The University of Texas) and K. Rajeshwar (University of Texas)

103 Renewable Fuels via Artificial Photosynthesis or Heterocatalysis 4

Energy Technology / Sensor

103 Poster Session – 18:00 – 20:00

Chair(s): Heli Wang

- 1641 **Hydrogen PEC Supernode: Emergent Degradation Mechanisms with Integration and Scale up of PEC Devices** – J. L. Young, T. G. Deutsch (National Renewable Energy Laboratory), and N. Danilovic (Lawrence Berkeley National Laboratory)
- 1642 **Electroreduction of CO₂ to High-Value Products Using Selenide Based Electrocatalysts** – A. Saxena (Missouri University of Science & Technology), J. Masud (The University of Kansas), and M. Nath (Missouri University of Science & Technology)
- 1643 **Photoelectrochemical Hydrogen Generation Using a Bis-Chelating Nickel PNP Catalyst Tethered to Band-Edge Modified Si(111)|TiO₂** – J. M. Gurrentz, D. G. Boucher, and M. J. Rose (University of Texas at Austin)

105 Heterogeneous Functional Materials for Energy Conversion and Storage 2

High-Temperature Energy, Materials, & Processes / Battery / Energy Technology / Physical and Analytical Electrochemistry
State Room 4, Dallas Sheraton Convention Center

Polymer Electrolyte Membrane Fuel Cells 1 - Membrane Properties – 08:00 – 09:40

Chair(s): Wilson K. S. Chiu and Thomas F. Fuller

- 08:00 1730 **(Invited) Role of Imaging in Modeling of Cathode Catalyst Layers in Proton Exchange Membrane Fuel Cells** – T. F. Fuller (School of Chemical & Biomolecular Engineering)
- 08:40 1731 **(Invited) Optimizing the Structure and Composition of PFSA/PVDF Fuel Cell Membranes** – P. N. Pintauro, R. Wycisk, and D. Powers (Vanderbilt University)
- 09:20 1732 **Electrochemical Characterization of Ion Exchange Composite Membrane with Various Ion Exchange Group Moieties** – T. Y. Son (Gyeongsang National University in Korea), T. H. Ko, K. H. Kim, and S. Y. Nam (Gyeongsang National University)

Polymer Electrolyte Membrane Fuel Cells 2 - Anion Exchange Membranes and Catalysts – 10:00 – 12:40

Chair(s): John R. Varcoe and Paul A Kohl

- 10:00 1733 **(Invited) High Conductivity, Stable Anion Conducting Membranes Based on Poly(norbornene)** – P. A. Kohl, G. Huang, and M. Mandal (Georgia Institute of Technology)

- 10:40 1734 **(Invited) Low Ionic Resistance Radiation-Grafted Cation- and Anion-Exchange Membranes for Reverse Electrodialysis (salinity gradient power) Application: Cross-Linking Is Essential for High Permselectivities.** – T. Willson, R. Bance-Soualhi (University of Surrey), I. Hamerton (University of Bristol), and J. R. Varcoe (University of Surrey)
- 11:20 1735 **(Invited) Development of High Performance Non-PGM Electrocatalysts and Electrodes for the Oxygen Reduction Reaction in Aemfcs** – X. Peng (University of South Carolina), V. Kashyap (National Chemical Lab, Pune, India), S. Kurungot (National Chemical Laboratory), and W. E. Mustain (University of South Carolina)
- 12:00 1736 **An Investigation into the Self-Purging Mechanism of Anion Exchange Membrane Fuel Cells Exposed to Carbon Dioxide** – J. A. Wrubel, A. A. Peracchio, B. N. Cassenti (University of Connecticut), K. N. Grew (U.S. Army Research Laboratory), and W. K. S. Chiu (University of Connecticut)
- 12:20 1737 **Biodegradable Self-Powered Electronics** – Z. Li (Beijing Institute of Nanoenergy and Nanosystems, CAS)

Polymer Electrolyte Membrane Fuel Cells 3 - Heterogeneous Catalysts and Gas Diffusion Layers – 13:20 – 15:40

Chair(s): Ahmet Kusoglu and Vito Di Noto

- 13:20 1738 **(Invited) Nano-Structured ORR Catalysts for PEM Fuel Cells** – J. Lim and E. Cho (KAIST)
- 14:00 1739 **(Keynote) Interplay between Properties, Electrical Response and Conductivity Mechanism in Hybrid Inorganic-Organic Ion-Exchange Membranes for Electrochemical Applications** – V. Di Noto (Dept. of Industrial Engineering, University of Padova, INSTM), K. Vezzù (CMBM, University of Padova, Dept. of Industrial Engineering, University of Padova), E. Negro (Centro Studi “Giorgio Levi Cases”, Dept. of Industrial Engineering, University of Padova), C. Sun, A. Nale, Y. Bang (Dept. of Industrial Engineering, University of Padova), G. Pagot (Dept. of Industrial Engineering, University of Padova, Centro Studi “Giorgio Levi Cases”), and G. Pace (CNR-ICMATE)
- 14:40 1740 **Microstructure and Transport Analyses in Polymer Electrolyte Membrane Fuel Cells: Comparing Modeling Approaches** – C. R. Randall and S. C. DeCaluwe (Colorado School of Mines)
- 15:00 1741 **The Examination and Characterisation of Water Transport in Metal Gas Diffusion Layers for PEMFC Via EIS and Neutron Imaging.** – K. F. Fahy, C. Lee, J. K. Lee, B. Zhao (University of Toronto), J. M. LaManna, E. Baltic, D. S. Hussey, D. L. Jacobson (National Institute of Standards and Technology), and A. Bazylak (University of Toronto)

- 15:20 1742 **On the Potential of 3D Printed Micro Structured Porous Media to Enhance PEM Fuel Cell Performance** – V. P. Schulz (University of Toronto, DHBW Mannheim), S. Schmitz (DHBW Mannheim), B. Auvity (University of Nantes), and T. Starke (3D MicroPrint GmbH)

Polymer Electrolyte Membrane Fuel Cells 4 - Membranes – 16:00 – 18:00

Chair(s): EunAe Cho and Steven C. DeCaluwe

- 16:00 1743 **(Invited) Preparing Composite Electrolytes: A Comedy in Two Acts** – T. A. Zawodzinski Jr. (University of Tennessee-Knoxville)
- 16:40 1744 **(Invited) Transport-Stability Relationships in Composite Polymer-Electrolyte Membranes** – A. Kusoglu (Lawrence Berkeley National Laboratory)
- 17:20 1745 **(Invited) Elucidating Ion Transport Mechanisms in Polymerized Ionic Liquids** – H. Liu and S. J. Paddison (University of Tennessee, Knoxville)

Lone Star B/C, Dallas Sheraton Convention Center

I05 Poster Session – 18:00 – 20:00

Chair(s): Wilson K. S. Chiu and Srikanth Gopalan

- 1746 **Defect Engineering of NiCo₂(O, S)_x/S-CNTs Oxygen Electrocatalysts for Rechargeable Quasi-Solid-State Flow Zinc–Air Batteries** – N. Xu, T. Su, K. N. Richard, Y. Wang, X. D. Zhou (University of Louisiana at Lafayette), and J. Qiao (Donghua University)
- 1747 **Synthesis of Pt/C Catalyst Using Carbon Support Derived from Tamarind Seeds through Hetroatom Doping for Oxygen Reduction Reaction** – Y. P. Kharwar (Indian Institute of Technology Madras), S. Akula, A. K. Sahu (CECRI-CSIR Madras Unit Chennai), and K. Ramanujam (Indian Institute of Technology Madras)
- 1748 **Optimization of Anion Exchange Membranes Derived from Bacterial Cellulose for Solid-State Supercapacitors** – X. Guo (Donghua University) and J. Qiao (Donghua University)
- 1749 **Characterization of Surface Changes on Molybdenum Nitride Thin Films during the Oxygen Reduction Reaction Using Operando Grazing Incidence X-Ray Absorption Spectroscopy** – M. B. Stevens, M. E. Kreider (Stanford University, Department of Chemical Engineering), B. M. Gibbons (Stanford University), A. Gallo (Stanford University, SLAC National Accelerator Laboratory), A. Mehta, R. Davis (SLAC National Accelerator Laboratory), L. A. King (Stanford University, Department of Chemical Engineering), and T. F. Jaramillo (Department of Chemical Engineering, Stanford University)

- 1750 **Anion Exchange Membrane Fuel Cell Application of Synthesized Poly(ether ether ketone) Containing Imidazolium** – S. Y. Nam (Gyeongsang National University), T. Y. Son (Gyeongsang National University in Korea), T. H. Ko, and K. H. Kim (Gyeongsang National University)
- 1751 **In Situ Exsolved Co Nanoparticles on Ruddlesden-Popper Material As Highly Active Catalyst for CO₂ Electrolysis to CO** – S. Park, Y. Kim, H. Han (Department of Chemical Engineering, POSTECH), Y. S. Chung (Pohang University of Science and Technology), W. Yoon, J. Choi, and W. B. Kim (Department of Chemical Engineering, POSTECH)
- 1752 **3D Analysis of Observed and Simulated Microstructure Evolution in SOFC Anodes** – M. Wieler (Robert Bosch GmbH), F. Wankmüller, A. Weber (IAM-WET, Karlsruhe Institute of Technology (KIT)), P. W. Hoffrogge (Hochschule Karlsruhe), D. Schneider (Hochschule Karlsruhe, Karlsruhe Institute of Technology), B. Nestler (Karlsruhe Institute of Technology, Hochschule Karlsruhe), P. Haremski (Robert Bosch GmbH, Karlsruhe Institute of Technology), and P. Lupetin (Robert Bosch GmbH)
- 1753 **Design and Fabrication of Solid Electrolyte for the Prevention of Electrode/Electrolyte Delamination** – M. J. Son and H. T. Lim (Changwon National University)
- 1754 **Embedded Reference Electrode in Segmented Cathodes to Understand in-Plane Performance Variation on Anode-Supported SOFCs** – M. W. Kim, J. M. Kim, H. S. Park, and H. T. Lim (Changwon National University)
- 1755 **Highly Uniform Al₂O₃ Coating on HSAB Nanoparticle Using Vibration Atomic Layer Deposition** – J. H. Oh, S. W. Park, H. J. Choi, G. D. Han, E. J. Shin, and J. H. Shim (Korea University)
- 1756 **Ag-YSZ Nanocomposites As Alternative Catalysts for Platinum for High Performance Low Temperature Solid Oxide Fuel Cells** – E. J. Shin, H. J. Choi, G. D. Han, J. H. Oh, and J. H. Shim (Korea University)
- 1757 **Influence of Ink Composition and Operation Parameters on the Performance of Fe-N-C** – C. Gallenkamp, M. Kübler, and U. I. Kramm (Technische Universität Darmstadt)
- 1758 **Cu-Based Bimetallic Electrocatalysts for CO₂ Electrochemical Conversion to Valuable Chemicals: Study of Product Selective Distribution** – M. R. C. Casale and F. H. B. Lima (IQSC - Institute of Chemistry of Sao Carlos)
- 1759 **Fabrication of Nanofibrous La_{1-x}Sr_xCoO₃/GDC Composite Cathode Using a Combination of Chemically Assisted Electrodeposition and Infiltration Techniques for Solid Oxide Fuel Cells** – S. B. Lee (Korea Institute of Energy Research (KIER)), S. U. Rehman (KIER), R. H. Song, T. H. Lim, and J. E. Hong (Korea Institute of Energy Research (KIER))
- 1760 **Fabrication of Solid Oxide Fuel Cell Composite Cathodes Using a Desktop Inkjet Printer** – J. S. Park, G. D. Han, H. J. Choi, E. H. Kang, and J. H. Shim (Korea University)
- 1761 **Nanocomposites of Honeycomb Double Layered MnO₂ Nanosheets/Cobalt Doped Hollow Carbon Nanofiber for Application in Supercapacitor and Primary Zinc-Air Battery** – X. Yang, W. Peng, K. Fu, L. Mao, J. Jin, S. Yang, and G. Li (donghua university)
- 1762 **Doped-Zirconia Treated Silver Nanocomposite Cathode for High Performance Low Temperature Solid Oxide Fuel Cells** – H. J. Choi, G. D. Han, J. S. Park, J. H. Oh, and J. H. Shim (Korea University)
- 1763 **Synergistic Hybrid MoS₂/Fe₂O₃ Composites for Efficient Hydrogen Evolution in Alkaline Media** – J. Hu and C. Zhang (Kunming University of Science and Technology)
- 1764 **Solid Acid Catalysts from Biowaste and Their Potential for Biodiesel Production** – S. S. Memon (NCE in Analytical Chemistry, University of Sindh Jamshoro)
- 1765 **Enhancement of Electrochemical Properties of Anode-Supported Solid Oxide Fuel Cells using In-situ Synthesis of Multi-doped Ceria Nanoparticles** – J. E. Hong, H. Ahmad Ishfaq, T. H. Lim, S. B. Lee, S. J. Park, R. H. Song (Korea Institute of Energy Research (KIER)), and K. T. Lee (DGIST)



An Invited Symposium on Advances and Perspectives on Modern Polymer Electrolyte Fuel Cells – In Honor of Shimshon Gottesfeld

Energy Technology / Industrial Electrochemistry and Electrochemical Engineering / Physical and Analytical Electrochemistry
Houston Ballroom C, Dallas Sheraton Convention Center

Anion Exchange Membranes/Polymer Electrolytes 1 – 08:00 – 12:00
Chair(s): Hui Xu and Adam Z. Weber

- 08:00 1815 *(Invited)* **Effects of an Alkyl Spacer and the Cationic Group on the Hydrated Morphology of Anion Exchange Membranes** – S. J. Paddison (University of Tennessee, Knoxville), X. Luo, and Z. Zhu (University of Tennessee)
- 08:25 1816 *(Invited)* **Limits of Polymer Electrolyte Membranes** – C. Mittelsteadt (Giner, Inc.)
- 08:50 1817 *(Invited)* **Materials/System Tradeoffs for Automotive Fuel Cell Applications** – C. S. Gittleman (General Motors) and A. Kongkanand (Global Fuel Cell Business, General Motors)
- 09:15 1818 *(Invited)* **Low Temperature Electrolysis for Hydrogen at Scale** – S. Mukerjee (Chemistry and Chemical Biology, Northeastern University), I. Kendrick, and H. Doan (Northeastern University)
- 09:40 1819 *(Invited)* **Pathways Towards High-Performance Reversible Alkaline Membrane Fuel Cells** – H. Xu (Giner Inc.), G. Wu (University at Buffalo, the State University of New York), and Y. Yan (University of Delaware)
- 10:00 **Break**

Wednesday, May 29

- 10:20 1820 **(Invited) U.S. DOE Early-Stage Alkaline Membrane Fuel Cell R&D** – D. C. Papageorgopoulos, D. Peterson, D. Ho (U.S. Department of Energy), G. Kleen (U. S. Department of Energy), N. L. Garland, and S. T. Thompson (U.S. Department of Energy)
- 10:45 1821 **(Invited) Performance of Nanofiber Meas in a Hydrogen/Air Fuel Cell with Low Relative Humidity Feed Gases** – P. N. Pintauro, K. Waldrop, J. Slack, D. Powers, R. Wycisk (Vanderbilt University), C. Gumeci, J. Parrondo, and N. Dale (Nissan Technical Center North America)
- 11:10 1822 **(Invited) Molecular Engineering of Quaternary Ammonium Aromatic Polymers for Anion Exchange Membrane Fuel Cells** – C. Bae (Rensselaer Polytechnic Institute)
- 11:35 1823 **(Invited) Quantitative Understanding of CO₂ Behavior in Anion Exchange Membrane Fuel Cells** – Y. Zheng, X. Peng, and W. E. Mustain (University of South Carolina)

Anion Exchange Membranes/Polymer Electrolytes 2 – 13:40 – 18:00
Chair(s): Yushan Yan and Peter N. Pintauro

- 13:40 1824 **(Invited) Modeling of Carbon Dioxide Exposure and Mitigation in Hydroxide Exchange Membrane Fuel Cells** – B. P. Setzler, L. Shi, T. Wang, and Y. Yan (University of Delaware)
- 14:00 1825 **(Invited) Switching from Low-Density to High-Density Polyethylene As a Base Material for Radiation-Grafted Anion-Exchange Membranes Leads to Much Higher Alkaline Membrane Fuel Cell Performances** – L. Wang and J. R. Varcoe (University of Surrey)
- 14:25 1826 **(Invited) Anion Exchange Membranes** – M. Hickner (The Pennsylvania State University)
- 14:50 1827 **(Invited) Anion Exchange Membranes Based on Functionalized Block Copolymers** – M. Yandrasits, C. Laskowski, T. Gillard (3M Corporate Research Materials Lab), M. Kurkowski (3M Energy Components Program), M. Lindsay (3M Corporate Research Materilas Lab), B. S. Pivovar, and Z. R. Owczarczyk (National Renewable Energy Laboratory)
- 15:15 1828 **(Invited) Stable and Conductive Anhydrous Proton Conducting Membranes Based on Polycations Blended with Polybenzimidazole** – C. G. Arges, G. Venugopalan, and S. Kole (Louisiana State University)
- 15:35 **Break**
- 15:55 1829 **(Invited) Ten Years on: Evolution, Status and Future of Alkaline Exchange Membrane Fuel Cell Systems** – M. Page, A. Amel, C. Azra, A. Kitayev, and C. Ben-Yehuda (PO-CellTech)
- 16:15 1830 **(Invited) High Performance Alkaline Membrane Fuel Cells Powered By Direct Ammonia** – B. Achrai, G. Tamir (PO-CELLTECH), A. Kitayev (PO-CellTech), E. Tal-Gutelmacher, and M. Page (PO-CELLTECH)

- 16:40 1831 **(Invited) Comparison of Hydrogen Pump and Electrochemical Impedance Spectroscopy Methods for Proton Transport Resistance Measurements in Catalyst Layers** – D. C. Sabarirajan (Tufts University), Y. Qi (University of California, Irvine), and I. V. Zenyuk (University of California Irvine)
- 17:05 1832 **(Invited) Water and Thermal Management in Polymer-Electrolyte Fuel Cells** – A. Z. Weber (Lawrence Berkeley National Laboratory)
- 17:30 1833 **(Invited) Progress in Alkaline Membranes and Alkaline Membrane Fuel Cells at the National Renewable Energy Lab** – A. Neyerlin (National Renewable Energy Laboratory), D. Strasser (National Renewable Energy Lab), C. M. Antunes (National Renewable Energy Laboratory), K. Meek (National Renewable Energy Lab), Z. R. Owczarczyk, and B. S. Pivovar (National Renewable Energy Laboratory)
- 17:55 **Concluding Remarks**



Young Investigators in Organic and Biological Electrochemistry

Organic and Biological Electrochemistry / Physical and Analytical Electrochemistry
Pearl 3, Dallas Sheraton Hotel

Young Investigators in Organic and Biological Electrochemistry - Session 1 – 08:05 – 11:20

Chair(s): Graham T. Cheek and Sadagopan (Gopan) Krishnan

- 08:05 **Welcoming Remarks**
- 08:10 1872 **(Invited) Detection of Hydrophobic Analytes on a Nanomolar Scale Via Cyclodextrin Mediated Surfaces** – J. M. Halpern, Z. Panahi, M. Merrill, S. Marnoto, L. Li, and E. Ziino (University of New Hampshire)
- 08:40 1873 **A 3rd generation Biosensor Towards the Continuous Long-Term Glucose Monitoring without Ag/AgCl Reference Electrode** – L. Ramašauskas (Vilnius Gediminas Technical University), M. Dagys (UAB “Bioanalizes sistemas”, Ltd), and D. Ratautas (Vilnius Gediminas Technical University, Vilnius University)
- 09:00 1874 **Micro Paper-Based Electrochemical Device for Small Molecule Diabetes Biomarkers** – J. Niroula, G. Premaratne, and S. Krishnan (Oklahoma State University)
- 09:20 1875 **Real-Time Insight into the Doping Mechanism of Redox-Active Organic Radical Polymers** – S. Wang, F. Li, A. D. Easley, and J. L. Lutkenhaus (Texas A&M University)
- 09:40 **Intermission**
- 10:00 1876 **Development of Electrochemical Nanosensor for the Detection of Malaria Parasite in Clinical Samples** – O. R. Obisesan (Obafemi Awolowo University, Ile Ife, Nigeria), Mahatma Gandhi University, Kottayam, India), A. S. Adekunle (Obafemi Awolowo University, Ile-Ife), J. A. O. Oyekunle (Obafemi Awolowo University, Ile Ife, Nigeria), and S. Thomas (Mahatma Gandhi University, Kottayam, India)

- 10:20 1877 **Controlling Ureidopyrimidinone Polymerization Via Electrochemical Redox Reactions** – M. Cedano and D. K. Smith (San Diego State University)
- 10:40 1878 **Electrochemically Stable and Adherent PEDOT Coatings for High Quality EMG Recording** – N. Rossetti, P. Luthra, A. Lee, C. Bodart Leguen, and F. Cicoira (Polytechnique Montréal)
- 11:00 1879 **Control of Bond Strength in H-Bond Dimers Via Proton Transfer Induced By Electron Transfer** – H. Choi and D. K. Smith (San Diego State University)

Young Investigators in Organic and Biological Electrochemistry - Session 2 – 14:00 – 15:05

Chair(s): Alice H. Suroviec and Sadagopan(Gopan) Krishnan

- 14:00 **Welcoming Remarks**
- 14:05 1880 **Selectively Modified Odorant Molecules for Odor Mitigation** – M. M. Vasquez, E. Ngaboyamahina (Duke University), C. A. De March, H. Matsunami (Duke University School of Medicine), and J. T. Glass (Duke University)
- 14:25 1881 **Protein Film, and Diffusion-Controlled Voltammetry of Hemeproteins on a Single Surface** – B. Gerroll (Indiana University Bloomington) and D. G. Peters (Indiana University)
- 14:45 1882 **Insights into Nanoarchitectural Structures to Enhance the Catalysis Properties of Human Liver Microsomes** – J. T. Moulton, G. Premaratne, J. Niroula, and S. Krishnan (Oklahoma State University)

Lone Star B/C, Dallas Sheraton Convention Center

K03 Poster Session – 18:00 – 20:00

- 1883 **Crosslinkable Nitroxide Radical Polymer for Energy Storage Applications** – S. Wang, A. D. Easley, F. Li, and J. L. Lutkenhaus (Texas A&M University)
- 1884 **Semi-Automated Electrochemical Microfluidic Immunoarray for Cancer Diagnostics** – L. DhanapalaMudiyanselage, A. L. Jones (University of Connecticut), and J. F. Rusling (National Univ of Ireland at Galway)

L01 Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry General Session and Grahame Award Symposium

Physical and Analytical Electrochemistry
Trinity 3, Dallas Sheraton Hotel

Spectroelectrochemistry 4 – 08:00 – 11:20

Chair(s): Pawel J. Kulesza, Andrew M. Herring, Vito Di Noto and Iwona Agnieszka Rutkowska

- 08:00 1915 **In-Situ Ultra-Low Frequency SERS Observation at Electrified Interfaces** – K. Ikeda (Nagoya Institute of Technology)

- 08:20 1916 **Mechanistic Insights into Enzymatic Nitric Oxide Reduction Revealed By Surface-Enhanced Infrared Absorption Spectroscopy** – M. Kato, Y. Masuda, S. Nakagawa (Hokkaido University), T. Toshi (Riken), and I. Yagi (Hokkaido University)

- 08:40 1917 **Versatility of Time-Resolved Raman Spectroelectrochemistry: From the Resolution of Mixture of Vitamins to the Detection Pesticides** – P. Fanjul (Metrohm), D. Ibáñez, A. Junquera-Pérez, M. B. González-García, and D. Hernández-Santos (Metrohm DropSens)

09:00 **Break**

- 09:20 1918 **Solvent Effects on Nafion Dispersion Structure Probed By Infrared Spectroscopy** – Y. Liang and C. Korzeniewski (Texas Tech University)

- 09:40 1919 **Electrochemical Cell with Electrolyte Flow Enables *Operando* ATR-IR Spectroscopy of Electrocatalytic CO₂ Reduction through Control of Mass Transport** – J. C. Lin (SUNCAT Center for Interface Science and Catalysis, Stanford University Department of Chemical Engineering), J. E. Aviles Acosta (Stanford Univ. Dept. of Materials Science & Engineering, SUNCAT Center for Interface Science and Catalysis), C. Hahn, and T. F. Jaramillo (SLAC National Accelerator Laboratory)

- 10:00 1920 **Probing the Impact of Interfacial Electric Fields and Hydrogen-Bonding Interactions on the Electroreduction of CO to Ethylene** – M. Waegle (Boston College)

- 10:20 1921 **Focal Point Sequestration for Operando Raman Confocal Micro-Spectroscopy of Fuel Cell Catalytic Layers** – E. S. Smotkin (Northeastern University)

- 10:40 1922 **A Novel Electrochemical-Electron Paramagnetic Resonance Spectroscopic Technique for in-Situ Radical Formation and Detection on Graphite Pencil Electrode.** – M. A. Morsy (King Fahd University of Petroleum & Minerals), A. M. Kawde (King Fahd University of Petroleum and Minerals), and L. M. Bui (Adani Systems Inc.)

- 11:00 1923 **Operando Observation of Cobalt Catalysts for Water Splitting By X-Ray and Infrared Absorption Spectroscopy** – K. Yamada, Y. Sakata, and M. Yoshida (Yamaguchi University)

Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry General Session 3 – 13:00 – 15:30

Chair(s): Faisal M. Alamgir and Charlotte Flatebo

- 13:00 1924 **Pt Nanowires with High Catalytic Activity and Durability Towards Methanol Oxidation Reaction** – Y. Liu (University of Arkansas), D. Geng (University of Science and Technology Beijing), and X. Meng (University of Arkansas)

- 13:20 1925 **Using an Ultrasonic Input for Ammonium Persulfate Electrosynthesis and Advanced Oxidation Processes** – A. G. Wallace, P. J. McHugh, and M. Symes (University of Glasgow)

- 13:40 1926 **Electrodissolution Inhibition of Gold Nanorods with Oxoanions** – C. Flatebo, S. S. E. Collins, B. S. Hoener, Y. Cai, S. Link, and C. F. Landes (Rice University)
- 14:00 **Break**
- 14:30 1927 **Clear-to-Black Dynamic Windows with Minute-Long Switching Using Reversible Metal Electrodeposition** – S. M. Islam (University of Nevada, Reno), T. S. Hernandez (Stanford University), M. McGehee (University of Colorado, Boulder), and C. J. Barile (University of Nevada, Reno)
- 14:50 1928 **Determination of Surface Area and Reaction Rate Constant from Cyclic Voltammetry Considering Voltage-Dependence of the CPE Parameters** – P. Charoen-amornkiatt, T. Suzuki (Osaka University), and S. Tsushima (JST-PRESTO)
- 15:10 1929 **A Versatile Architecture for Electronically Tunable Electrocatalytic Activity: Graphene-Templated Atomically Thin Pt Supported on Oxygen-Deficient Titania** – C. Bell, D. C. Lee (Georgia Institute of Technology), C. Rouleau (Oak Ridge National Laboratory), K. Sasaki (Chemistry Department, Brookhaven National Laboratory), M. Williams (Clark Atlanta University), and F. M. Alamgir (Georgia Institute of Technology)

L04 Polyoxometallates and Nanostructured Metal Oxides in Efficient Electrocatalysis, Energy Conversion, and Charge Storage

Physical and Analytical Electrochemistry / Energy Technology
Trinity 2, Dallas Sheraton Hotel

Polyoxometallates and Nanostructured Metal Oxides in Efficient Electrocatalysis, Energy Conversion, and Charge Storage 7 – 10:00 – 11:50

Chair(s): Gary J. Blanchard and Ana C Tavares

- 10:00 1989 **(Keynote) Lithiated Fluorinated “Core-Shell” Nanoparticles As Single-Ion-Conducting Electrolytes for Lithium Batteries** – K. Vezzù (Dept. of Industrial Engineering, University of Padova, CMBM, University of Padova), G. Pagot (Dept. of Industrial Engineering, University of Padova, Centro Studi “Giorgio Levi Cases”), E. Negro (Centro Studi “Giorgio Levi Cases”, Dept. of Industrial Engineering, University of Padova), A. Nale, Y. Bang (Dept. of Industrial Engineering, University of Padova), and V. Di Noto (Dept. of Industrial Engineering, University of Padova, INSTM)
- 10:40 1990 **(Keynote) Tuning the Electrochemical Properties of Polyoxometalates: Impact on Photosensitizer-Polyoxometalate Dyads and Electronic Molecular Junctions** – A. Proust, F. Volatron, S. Blanchard, and G. Izzet (Sorbonne Université)
- 11:20 1991 **(Invited) Nitride Plasmonics for Enhanced Electrochemical Oxidation** – B. Simpkins (U.S. Naval Research Laboratory), A. Purdy (Naval Research Laboratory), A. Epshteyn (U.S. Naval Research Laboratory), S. Giles, J. Wynne (Naval Research Laboratory), and O. A. Baturina (U.S. Naval Research Laboratory)

Polyoxometallates and Nanostructured Metal Oxides in Efficient Electrocatalysis, Energy Conversion, and Charge Storage 8 – 14:10 – 15:30

Chair(s): Andrew M. Herring

- 14:10 1992 **(Keynote) Monitoring and Preparation-Performance Trends of Co-Based Catalysts for Electrochemical Water Oxidation** – G. R. Patzke, K. Lienau, L. Reith, C. A. Triana, R. J. Müller (University of Zurich), and D. Bleiner (Empa Dübendorf)
- 14:50 1993 **Single Nanoparticle Electrochromism Reveals Heterogeneous Charge Storage Rates and Ion Trapping Sites in Pseudocapacitive Smart Windows** – J. Sambur and R. C. Evans (Colorado State University)
- 15:10 1994 **The Effect of Pore Structure on Coaxial Electrospun and Pyrolyzed Polyacrylonitrile Derivatives and Phosphotungstic Acid for Hybrid Electrode Supercapacitors.** – J. A. Garcia, K. J. Balkus Jr., and J. P. Ferraris (The University of Texas at Dallas)

Polyoxometallates and Nanostructured Metal Oxides in Efficient Electrocatalysis, Energy Conversion, and Charge Storage 9 – 16:00 – 17:40

Chair(s): Pawel J. Kulesza, Vito Di Noto and Iwona Agnieszka Rutkowska

- 16:00 1995 **(Keynote) Promoting Electrochemical Oxygen Evolution in Acidic Media: Hydrophobic Stabilization of Earth Abundant Catalysts** – J. R. Galan-Mascaros (Institute of Chemical Research of Catalonia (ICIQ), ICREA), F. Garcés-Pinedaa, and J. Yua (Institute of Chemical Research of Catalonia (ICIQ))
- 16:40 1996 **Understanding the Highly Selective Electroreduction of Carbon Dioxide into Fuels on Hierarchical Oxide-Derived Inverse Opals** – T. D. Nguyen-Phan (National Energy Technology Laboratory, AECOM), D. R. Kauffman (National Energy Technology Laboratory), Y. Zhou, Y. Yu (National Energy Technology Laboratory, AECOM), E. Stavitski (Brookhaven National Laboratory), W. Xu (Argonne National Laboratory), B. H. Howard (National Energy Technology Laboratory), M. Y. Stuckman (National Energy Technology Laboratory, AECOM), I. Waluyo (Brookhaven National Laboratory), C. Wang, C. M. Marin (National Energy Technology Laboratory, AECOM), E. J. Popczun, and P. R. Ohodnicki Jr. (National Energy Technology Laboratory)
- 17:00 1997 **Vanadium Oxide Nanoflower – Carbon Nanofiber Composite Electrodes Derived from Poly(acrylonitrile-co-itaconic acid)** – M. Wunch (University of Texas at Dallas), S. Mahmood, K. J. Balkus Jr., J. P. Ferraris (The University of Texas at Dallas), and D. J. Yang (University of Texas at Dallas)
- 17:20 1998 **A Highly Sensitive and Stable Electrochemical Sensor for Simultaneous Detection of Dopamine and Uric Acid Based on the Phosphovanadotungstate and CNTs Decorated By Chitosan** – Z. Bai and J. Wang (Harbin Engineering University)

Chemical Sensors 1 – 08:00 – 12:20

Chair(s): Peter J Hesketh and Larry A. Nagahara

- 08:00 2021 **Electrochemical Detection of the Pesticide Bentazone Using Shadow-Printed Carbon Electrodes** – J. S. Noori (IPM - Intelligent Pollutant Monitoring, Technical University of Denmark), A. Geto (IPM - Intelligent Pollutant Monitoring), J. Mortensen (Roskilde University), W. E. Svendsen (DTU Nanotech, Technical University of Denmark), and M. Dimaki (Technical University of Denmark)
- 08:20 2022 **Enhancing Potentiometric Response Using Modified Ion Sensitive Transistor** – V. Abhinav, R. Patkar, M. Vinchurkar, T. R. Naik, and M. S. Baghini (Indian Institute of Technology Bombay)
- 08:40 2023 **Development of a Graphene-Nickel Composite Electrode for Hydroxyl Ion Sensing Applications** – B. Jafari and G. G. Botte (Ohio University)
- 09:00 2024 **Redox Active Molecule Induced Metal-Organic Framework Thin Film on Optical Fiber Towards Chemical Sensing of Carbon Dioxide** – K. J. Kim, J. Culp (National Energy Technology Laboratory, Leidos Research Support Team), P. R. Ohodnicki Jr. (National Energy Technology Laboratory, Carnegie Mellon University), P. Cvetic (National Energy Technology Laboratory, Leidos Research Support Team), and A. Goodman (National Energy Technology Laboratory)
- 09:20 2025 **Selectivity Enhancement of ZnO Toward Reducing Gases Using Characteristic Response Features Based on Surface Kinetics below 250°C** – I. K. Cheng, C. Y. Lin, and F. M. Pan (National Chiao Tung University)
- 09:40 2026 **Carbon Dioxide Sensing Characteristics of LaFe_{0.8}Co_{0.2}O₃ – ZnO Thin Films: The Role of Homo and Heterojunctions** – T. Bhowmick, S. Nag, and S. B. Majumder (IIT KHARAGPUR)
- 10:00 2027 **Sandwiched Platinum Thin Film TCD for 3-Omega Technique for Detection of Ammonia Gas** – A. Lotfi, M. Navaei (Georgia Tech Research Institute), and P. J. Hesketh (Georgia Institute of Technology)
- 10:20 2028 **Polymer/Metal–Organic Framework Composite Sensors for Gas Detection** – T. Hong (National Energy Technology Laboratory), J. Culp, K. J. Kim (Leidos Research Support Team, National Energy Technology Laboratory), and P. R. Ohodnicki Jr. (National Energy Technology Laboratory, Carnegie Mellon University)
- 10:40 **Break**

- 11:00 2029 **Ion-Selective Electrode Based on Thiosemicarbazide Schiff Base As Ionophore for Pb (II) Ion Sensor** – C. Mohan (K R Mangalam University, Sohna Road, Gurugram, India), K. Sharma (Maharaja Agrasan Institute of Technology), and S. Kumari (SPC Govt. College, Ajmer, India)
- 11:20 2030 **On-Chip Optical Anodic Stripping Voltammetry with Closed-Cell Bipolar Electrode Arrays for Heavy Metals Detection in Water** – E. Fahrenkrug, N. Humphrey, J. Miranda, and B. Thomas (Colorado College)
- 11:40 2031 **Ethanol Sensing Characteristics of Nitrogen Doped ZnO and in₂O₃ Thin Films** – P. K. Shihabudeen (Materials Science Centre, IIT Kharagpur) and A. Roy Chaudhuri (Materials Science Centre, IIT Kharagpur, Advanced Technology Development Centre, IIT Kharagpur)
- 12:00 2032 **Filter Paper Based Electrochemical Sensor for Selenium Detection in Water** – P. Devi (Central Scientific Instruments Organisation) and P. Kumar (Indian Association for Cultivation of Sciences)

Chemical Sensors 2 – 14:00 – 16:00

Chair(s): Petr Vanysek and Larry A. Nagahara

- 14:00 2033 **Impact of Titanium Content on the Structural Properties and Sensing Performance of Sol-Gel Synthesized CeTi_xO_y Sensing Films** – C. W. Wang, C. Y. Tan, J. L. Her, and T. M. Pan (Chang Gung University)
- 14:20 2034 **Structural Properties and Sensing Characteristics of YbTaO₄ Sensing Membranes** – C. H. Chen, T. M. Pan, and J. L. Her (Chang Gung University)
- 14:40 2035 **High-Performance Ce_{0.9}Sr_{0.1}(Zr_{0.53}Ti_{0.47})O₄ Sensing Membrane Using a Sol-Gel Method for a Solid-State pH Sensor** – T. M. Pan, B. S. Lou, Z. Y. Chen (Chang Gung University), and S. P. Bag (CHANG GUNG UNIVERSITY)
- 15:00 2036 **An Electrochemical Approach for Development of Novel Magnetic Multicomponent Alloy Thin Films for Sensor Applications** – C. L. P. Pavithra, R. K. Siri Kiran Janardhana, G. Ummethala, C. Murapaka, S. K. Malladi, and S. R. Dey (Indian Institute of Technology Hyderabad)
- 15:20 2037 **Planar and out of Plane Configuration Based Flexible Sensor of PVDF Polymer** – R. Ganguly, A. Acharyya, and R. Ramadurai (Indian Institute of Technology Hyderabad)
- 15:40 2038 **Developing High-Performance Non-Enzymatic Glucose Sensors Based on Transition Metal Chalcogenides** – M. Nath, B. Golrokh Amin (Missouri University of Science & Technology), and J. Masud (The University of Kansas)

M01 Poster Session – 18:00 – 20:00

Chair(s): Larry A. Nagahara, Bryan A. Chin, Peter J Hesketh, Gary W. Hunter, Jessica E. Koehne, Aleksandr Simonian and Petr Vanysek

- 2039 **Suspended 2D Material Biosensor for Reliable Sensing** – N. Masurkar, N. K. Thangavel, S. Yurgelevic, G. W. Auner, and L. M. R. Arava (Wayne State University)
- 2040 **Suppression Effects of Oxygen Deficient on Ultrathin Indium Oxide Electrochemical Transistors-Based Biosensors** – J. H. Park, Y. Y. Choi, and Y. S. Rim (Sejong University)
- 2041 **Low-Cost Colorimetric Textile Gas Sensor for Detection of Hydrogen Sulfide** – J. Lee (Kyungpook National University, Korea Institute of Industrial Technology (KITECH)), J. K. Kim (Kyungpook National University, Korea Institute of Industrial Technology (KITECH)), and D. Jung (Korea Institute of Industrial Technology (KITECH))
- 2042 **Study on Sulfonic Acid Functional Group Modified Imidazole Ionic Liquids for Oxygen Concentration Detection** – W. Yin and M. Zhang (Harbin Engineering University)
- 2043 **Simultaneous Detection of Carbendazim and Carbaryl Pesticides on Graphene-Biochar Electrodes Using Response Surface Optimization** – E. M. Sussuchi, M. V. S. SantAnna, S. W. M. M. Carvalho, I. S. C. Carregosa, and E. Santos (Universidade Federal de Sergipe - UFS)
- 2044 **Ultra-Sensitive Electrochemical Determination of Rifampicin Using the TiO₂nanoparticles Decorated Reduced Graphene Oxide Nanocomposite** – V. M. R. Yenugu (sri venkateswara Uiversity), L. Švorc (Slovak University of Technology), S. Bathinapatta (Yogi Vemana University), and M. Gajulapalle (Sri Venkateswara Uiversity)
- 2045 **Electrochemical Determination of Copper(II) Ions in Soil of Cultivation of Vegetables with Use of Bordeaux Syrup** – E. M. Sussuchi, J. O. S. Silva (Universidade Federal de Sergipe - UFS), J. B. S. Lima (Universidade Federal da Bahia - UFBA), S. W. M. M. Carvalho (Universidade Federal de Sergipe - UFS), R. R. Farias, and M. M. Victor (Universidade Federal da Bahia - UFBA)
- 2046 **Galvanic Dissolved Oxygen Sensor Based from Inkjet Printed Silver Cathode and Electrodeposited Zinc Anode** – L. P. Go and E. P. Enriquez (Ateneo de Manila University)
- 2047 **Enhanced Electro-Oxidation of Urea Using Hollow Structured Nickel Manganese Oxide Catalysts** – D. Lee, J. Yoon, E. Lee (Auburn University), S. P. Woo (Yonsei University), Y. S. Yoon (Gachon University), and D. J. Kim (Auburn University)
- 2048 **Non-Enzymatic Urea Biosensor Based on Silver-Nickel Oxyhydroxide Nanorods Composite Electrode** – J. Yoon, D. Lee, E. Lee (Auburn University), Y. S. Yoon (Gachon University), Y. Wang (Auburn University), and D. J. Kim (Materials Research and Education Center)

- 2049 **The Effect of Size and Content of Cerium Oxide on the Efficiency of a Composite Sensor for Hydroxyl Radicals Detection** – S. Duangthaiapornsuk, F. Alateeq, A. C. Alba-Rubio, and D. S. Kim (The University of Toledo)
- 2050 **Non-Enzymatic Electrochemical Detection of Mercury Ions on Graphene Quantum Dot-Based Electrodes** – C. C. Fu, J. W. Yang (Chang Gung University), C. T. Hsieh (YUAN ZE UNIVERSITY), and R. S. Juang (Chang Gung University)
- 2051 **Electrochemsense: Electrochemical Real-Time Pesticide Sensing System** – V. N. Dhamu, D. Sankhala, B. Jagannath, and S. Prasad (The University of Texas at Dallas)

M02

Semiconductor Electrochemistry and Photoelectrochemistry in Honor of Krishnan Rajeshwar - An Invited Symposium

Energy Technology / Physical and Analytical Electrochemistry / Sensor

State Room 3, Dallas Sheraton Convention Center

Electrochemistry and Photoelectrochemistry Session in Honor of

Prof. Rajeshwar – 07:50 – 09:30

Chair(s): Csaba Janáky

- | | | |
|-------|------|--|
| 07:50 | | Introductory Remarks |
| 08:00 | 2052 | (Invited) Role of Carbons in Electrochemical Applications – W. A. Wampler (Tokai Carbon CB) |
| 08:30 | 2053 | (Invited) The Role of Electronic Bulk and Surface Structures for Efficient Photo-Electro-Synthesis – W. Jaegermann (Darmstadt University of Technology, Technische Universität Darmstadt) |
| 09:00 | 2054 | (Invited) Photoelectrochemistry of Semiconducting Oxide Materials for Solar Water Splitting – G. Oskam (CINVESTAV-Mérida) |

Material Structure-Performance Session in Honor of Prof. Rajeshwar – 09:50 – 12:20

Chair(s): Scott Calabrese Barton and Pawel J. Kulesza

- | | | |
|-------|------|---|
| 09:50 | 2055 | (Invited) Copper(I) Oxide Semiconductor Based Systems for Photoelectrochemical Reduction of Carbon Dioxide – P. J. Kulesza (University of Warsaw) |
| 10:20 | 2056 | (Invited) Role of Surface States in Photocatalytic Oxygen Evolution with CuWO₄ Particles – F. E. Osterloh, Z. Wu, Z. Zhao, G. Cheung, R. M. Doughty (University of California-Davis), A. R. Ballestas-Barrientos (University of Sydney), B. Hirmez, R. Han (University of California-Davis), and T. Maschmeyer (The University of Sydney) |
| 10:50 | 2057 | (Invited) Interfacial Charge-Transfer Excitation at an Anatase-Rutile Junction: A Hypothesis – B. Ohtani (Institute for Catalysis, Hokkaido University), Y. Shen (Grad School of Environ. Sci, Hokkaido University), A. Nitta, and M. Takashima (Graduate School of Environmental Science, Hokkaido Univ.) |

- 11:20 2058 **(Invited) Mixed-Metal Oxides: Tuning Their Structures and Properties for Uses in the Capture and Conversion of Solar Energy** – P. A. Maggard (North Carolina State University)
- 11:50 2059 **(Invited) Directing Reaction Paths to Electrodeposit Opportune Nano Pn-junctions from Cu-in-Se Compounds** – S. Menezes (InterPhases Solar)

Photovoltaics and Solar Fuel Session in Honor of Prof. Rajeshwar – 13:40 – 15:40

Chair(s): Heli Wang

- 13:40 2060 **(Invited) Anodic TiO₂ Nanotube Layers: Efficient Photocatalyst** – H. Sopha, M. Krbal (University of Pardubice), S. Ng (Brno University of Technology), M. Motola, F. Dvorak, R. Zazpe, J. Prikryl (University of Pardubice), and J. M. Macak (Brno University of Technology, University of Pardubice)
- 14:10 2061 **(Invited) TiO₂ Nanotube Arrays: Photoelectrochemical and Photocatalytic Applications** – P. Schmuki (University of Erlangen-Nuremberg), N. Liu (University of Erlangen-Nuremberg (FAU)), and M. Altomare (University of Erlangen-Nuremberg)
- 14:40 2062 **(Invited) Bi-Based Solar Absorbers for Thin-Film Photovoltaic and Solar Fuels** – D. Tiwari (University of Bristol) and D. Fermin (School of Chemistry, University of Bristol)
- 15:10 2063 **(Invited) Electrochemistry for Sustainable Solar Photovoltaics** – M. Tao (Arizona State University)

Photoelectrochemistry Progress Session in Honor of Prof. Rajeshwar – 16:00 – 18:00

Chair(s): Nianqiang (Nick) Wu

- 16:00 2064 **(Invited) Confined Molecular Electrocatalyst for Electrochemical and Photoelectrochemical Hydrogen Evolution Reaction** – K. Uosaki (National Institute for Materials Science), T. Masuda, C. Kurniawan, Y. Sun, and H. Noguchi (Hokkaido University, National Institute for Materials Science)
- 16:30 2065 **(Invited) Progress in Photoelectrochemical Energy Conversion** – B. A. Parkinson (University of Wyoming)
- 17:00 2066 **(Invited) Materials By Design Principles in Artificial Photosynthesis: Discovery and Synergistic Integration of Light Absorbers, Electrocatalysts and Membranes for Complete, Stable, Efficient, and Safe Solar Fuels Generator** – N. S. Lewis (California Institute of Technology)
- 17:30 2067 **(Invited) Four Decades of Photoelectrochemistry and Semiconductor Electrochemistry: Some Reflections** – K. Rajeshwar (University of Texas)

Lone Star B/C, Dallas Sheraton Convention Center

M02 Poster Session – 18:00 – 20:00

Chair(s): Heli Wang and Csaba Janáky

- 2068 **Synthesis of CdTe Semiconductor Nanocrystals on Hydrotalcite Matrix Surface for Electrochemical Detection of Ciprofloxacin** – E. M. Sussuchi, S. W. M. M. Carvalho, I. F. Gimenez, and M. V. S. Sant'Anna (Universidade Federal de Sergipe - UFS)

M03 Sensors for Precision Medicine

Sensor

Trinity 4, Dallas Sheraton Hotel

Sensors for Precision Medicine - Session 3 – 08:00 – 12:40

Chair(s): Jessica E. Koehne and Leyla Soleymani

- 08:00 2083 **(Invited) Self-Powered Sensors Employing Biofuel Cells: Wearable and Ingestible Bioelectronics** – I. Jeeran (University of California, San Diego) and J. Wang (UCSD)
- 08:40 2084 **Creating Clinically-Relevant Biosensors-Integrating Hierarchically Structured Transducers with Dynamic Signal Recognition Elements** – L. Soleymani, Y. Chan, and A. Hosseini (McMaster University)
- 09:00 2085 **(Invited) Garment Integrated Sensors Created Using Reactive Vapor Deposition** – T. L. Andrew (UMass Amherst)
- 09:40 **Break**
- 10:00 2086 **(Invited) Emerging Nanomaterial Inks for Additive Manufacturing of Wearable Sensors** – K. Fujimoto, T. Pandhi, N. E. Mansoor, F. Muramutsa, H. Subbaraman, and D. Estrada (Boise State University)
- 10:40 2087 **Quantitative Electrochemical Analysis of Cathepsin B Activity Using Carbon Nanofiber Nanoelectrode Arrays With Optimized Peptide Substrate Length and Temperature** – Y. Song, H. Fan, M. J. Anderson, J. G. Wright, D. H. Hua (Kansas State University), J. E. Koehne, M. Meyyappan (NASA Ames Research Center), and J. Li (Kansas State University)
- 11:00 2088 **(Invited) Solid State Electrochemical Gas Sensors: Fundamentals, Materials and Applications** – V. Thangadurai and S. Mulmi (University of Calgary)
- 11:40 2089 **Highly Sensitive Detection of Protein Biomarkers Using Graphene Field-Effect Transistor Integrated with a Microfluidic Platform** – N. I. Khan, S. Ghosh, M. Mousazadehkasin, J. G. Tsavalas, and E. Song (University of New Hampshire)
- 12:00 2090 **(Invited) Gamma Irradiated WO₃ Nanostructures for Electrochemical Sensing of Multiple Depression Biomarkers** – C. Sekar and A. A. C. (Alagappa University)

Sensors for Precision Medicine - Session 4 – 14:00 – 17:40

Chair(s): Yuehe Lin and Pengyu Chen

- 14:00 2091 **(Invited) Plasmonic Nanostructures for Early Disease Detection and Precision Cancer Therapeutics** – K. Curtin, X. Gao (West Virginia University), J. Boryczka (West Virginia University), P. Zheng, S. Kasani, and N. Wu (West Virginia University)
- 14:40 2092 **(Invited) Toward Self-Powered and Skin-Conformal Sensor Devices - Integration of Ultra-Thin Sensors with Organic Solar Cells** – K. Fukuda (RIKEN), T. Someya (The University of Tokyo), and S. Park (RIKEN)
- 15:20 **Break**
- 15:40 2093 **(Invited) Inkjet Printing of Impedance Sensors for Living Tissues Monitoring** – R. Bernasconi, D. Meroni, A. Aliverti, and L. Magagnin (Politecnico di Milano)
- 16:20 2094 **Electrochemical Sensors to Monitor Multi-Drug Resistant Organisms in the Gut Microbiome** – A. Argun, M. Rana, A. Weber, M. Manoukian (GINER, INC.), A. Koh, and E. Toprak (University of Texas Southwestern Medical Center)
- 16:40 2095 **Multiplexed Surface Plasmon Imaging of Circulating Biomarkers** – S. Krishnan, G. Premaratne, Z. H. Al Mubarak, and A. Dharmaratne (Oklahoma State University)
- 17:00 2096 **(Invited) Electrochemical Preparation of Micro and Nano Structures and Systems in Silicon for (Bio)Sensing and Nano(Medicine) Applications** – G. Barillaro (University of Pisa)

Lone Star B/C, Dallas Sheraton Convention Center

M03 Poster Session – 18:00 – 20:00

- 2097 **PDMS/Uhmwpe Dura Mater Substitute Laminated with Conductive Graphene for Intracranial Pressure Sensing** – Q. Zhang, R. Li, J. Li, and P. Gao (The Hong Kong University of Science and Technology)
- 2098 **Microfabrication and Characterization of Microwire Microbiosensors for Simultaneous Detection of Glutamate and GABA** – C. Gong (Louisiana Tech University), I. Hossain, P. Doughty, T. Murray, P. U. Arumugam (Louisiana Tech University), and C. Tan (Institute for Micromanufacturing)
- 2099 **Unusual pH - Dependent Electrochemical Activity of Nitrogen Doped Graphene Oxide Towards Selective and Simultaneous Determination of Hydroquinone and Catechol** – A. Natarajan (Pondicherry University), E. Jayabal, and V. Rangarajan (Pondicherry University)
- 2100 **Disposable and Inexpensive Electrochemical Biosensor to Detect Ciprofloxacin** – N. P. Trevino, D. Ganta, W. Montes, and C. Guzman (Texas A&M Intl University)
- 2101 **A Real-Time Wearable Sensor to Monitor Alcohol Consumption through Ethyl Glucuronide Detection** – K. C. Lin, D. Sankhala (University of Texas at Dallas), S. Muthukumar (Enlisen LLC), and S. Prasad (University of Texas at Dallas)

- 2102 **Rapid Selection of Active Circulating Tumor Cells Using Combined Electrical and Optical Detection in a “Lab on Chip” Platform** – V. A. Kamat (Florida International University), T. Zhukov (Florida Analytical Imaging Solutions), and S. Bhansali (Florida International University)
- 2103 **The Use of Lab on a Chip Devices to Evaluate Infectious Biofilm Formation and Assess Antibiotics and Nano Drugs Treatments** – N. Bourguignon (Universidad Tecnológica Nacional, Buenos Aires, Florida International University), V. A. Kamat (Florida International University), B. Lerner, M. Perez (Universidad Tecnológica Nacional (UTN), Buenos Aires, Universidad de Buenos Aires (UBA), Buenos Aires), and S. Bhansali (Florida International University)
- 2104 **Microscale Surface Nanostructuring and Catalysis of Metallic Electrodes through Electrochemical Deposition and Dissolution in Ionic Liquids** – J. Jiang and R. Mariani (Idaho National Laboratory)
- 2105 **Leveraging Electrochemical Technique to Screen for Sepsis As a Point-of-Care-Device** – A. Tanak (The University Of texas at dallas), S. Muthukumar (Enlisen LLC), I. A. Hashim (UT southwestern medical center), and S. Prasad (University of Texas at Dallas)
- 2106 **Microfabrication and Characterization of Gold Nanoring Electrodes on Silicon Micro Pillar for Neurochemical Sensing** – H. Yin (Louisiana Tech University), C. Tan (Institute for Micromanufacturing), S. Siddiqui, and P. U. Arumugam (Louisiana Tech University)
- 2107 **An Improved Amperometric Microsensor Microarrays with High Sensitivity and High Selectivity for Ex-Vivo Glutamate Detection** – C. Tan (Institute for Micromanufacturing), P. Doughty (Louisiana Tech University), K. Magee (Clemson University), T. Murray, S. Siddiqui, and P. U. Arumugam (Louisiana Tech University)
- 2108 **A Novel Target Receptor Design and Biosensing Platform Using RAFT Polymer-Based Molecular Templating** – B. Si, R. Yang, G. Dutta, J. Csoros, H. M. N. Ahmad, W. R. Seitz, and E. Song (University of New Hampshire)
- 2109 **Selective Monitoring of Anti-Cancer Drug in Real Sample Matrix Employing Nanomaterial Based Electrochemical Biosensor** – R. Savalia and S. Chatterjee (Institute of Chemical Technology)
- 2110 **Bifunctionality of Carbon Nanotubes – Chitosan Film Based Biosensor for Selective Determination of Atropine in Biological Fluids and Leaf Extract of *Datura Stramonium*** – S. S. Mane and S. Chatterjee (Institute of Chemical Technology)
- 2111 **An Electrochemical Sensor for Disease Diagnosis and Decision Making By Passively Monitoring Chloride Ion Levels in Human Sweat** – A. Ganguly (University of Texas At Dallas -) and S. Prasad (University of Texas at Dallas)

- 2112 **Layer-By-Layer Biofunctionalization As a Novel Route for High-Sensitivity and High-Specificity Label-Free Affinity Biosensing with Nanostructured Materials** – S. Mariani, V. Robbiano (University of Pisa), L. Strambini (Italian National Research Council), A. Debrassi, G. Egri, L. Daehne (Surflay Nanotec GmbH), and G. Barillaro (University of Pisa)

THURSDAY, MAY 30

A01 Battery and Energy Technology Joint General Session

Energy Technology / Battery

Houston Ballroom A, Dallas Sheraton Convention Center

Battery Modelling 1 – 08:00 – 12:00

Chair(s): Hui Xu, Ming Tang and Wolfram Jaegermann

- | | | |
|-------|----|---|
| 08:00 | 92 | Modeling the Effects of Cycling on Dendrite Growth in Lithium Batteries – J. Tan (Shenzhen University) and E. Ryan (Boston University) |
| 08:20 | 93 | Performance of Li-Ion Batteries: Contribution of Electronic and Ionic Factors – W. Jaegermann (Technische Universität Darmstadt) and R. Hausbrand (Darmstadt University of Technology) |
| 08:40 | 94 | Understand and Mitigate Reaction Non-Uniformity in Battery Electrodes – K. Yang, Y. Zhang, F. Wang, and M. Tang (Rice University) |
| 09:00 | 95 | Structure of Confined Ionic Liquids in Graphitic Nanopores from Ab-Initio Molecular Dynamics Simulations – T. A. Pham (Lawrence Livermore National Laboratory), R. Coulthard (Yale University), M. Zobel (University of Bayreuth), S. Buchsbaum (Lawrence Livermore National Laboratory), D. Plata (Massachusetts Institute of Technology), B. C. Wood, F. Fornasiero, and E. Meshot (Lawrence Livermore National Laboratory) |
| 09:20 | 96 | Three-Dimensional Modeling of Mediator-Enhanced Solid-State Supercapacitors – X. Zhou, Y. Wang, X. Qiao, C. Zhang (University of Miami), and A. N. Mansour (Naval Surface Warfare Center, Carderock Division) |
| 09:40 | | Break |
| 10:00 | 97 | Comsol Modelling of the Experimental Results Obtained from a Lithium Ion Battery with a Low Binder Content Lithium Iron Phosphate (LiFePO₄) Cathode – V. G. Watson, D. R. R. Kannan, L. Morris (FAMU-FSU College of Engineering), A. Shellikeri (Florida State University, Aero-Propulsion, Mechatronics and Energy Center), P. L. Moss (Florida A&M University - Florida State University), M. H. Weatherspoon (FAMU-FSU college of Engineering), J. P. Zheng (Florida State University), Y. D. Yeboah (FAMU-FSU College of Engineering), and E. E. Kalu (Florida A&M University - Florida State University COE) |
| 10:20 | 98 | Optimization of Energy Transfer during Active Balancing of Lithium-Ion Batteries – P. L. Moss, D. R. Rajagopalan Kannan, R. Sonavane, and M. H. Weatherspoon (Florida A&M University - Florida State University) |
| 10:40 | 99 | Towards an Atomic-Level Understanding of Solid Electrolyte Interphase Formation through Molecular Simulation – M. J. Boyer and G. S. Hwang (University of Texas at Austin) |

A02**Lithium Ion Batteries and Beyond**

Battery / Physical and Analytical Electrochemistry

Lone Star A2, Dallas Sheraton Convention Center

Beyond Lithium Ion 1 – 08:00 – 12:00**Chair(s): Hyunpyo Lee, Mohit Mehta and Zhenyou Li**

- 08:00 344 **High Energy Density Li-Air Battery with the Polymer Electrolyte Coated CNTs Electrode Via Layer-By-Layer Method** – H. Lee (Samsung Electronics Co., Ltd.), D. J. Lee (Samsung Electronics), M. Kim, H. Kim, H. J. Kwon (Samsung Electronics Co., Ltd.), H. C. Lee (Samsung Electronic Co., Ltd.), and D. Im (Samsung Electronics Co., Ltd.)
- 08:20 345 **Rechargeable Aluminum/Natural Graphite Battery Based on Deep Eutectic Solvents** – K. L. Ng, M. Malik, and G. Azimi (University of Toronto)
- 08:40 346 **Room Temperature Fluoride Ion Batteries** – A. R. Munnangi (Helmholtz Institute Ulm (HIU)), I. Mohammad (Tallinn University of Technology), and M. Fichtner (Karlsruhe Institute of Technology (KIT))
- 09:00 347 **A Multi-Physics Study on High-Power Li-O₂ Batteries for Electric Aircrafts** – M. Mehta (Analytical Mechanics Associates, Inc., NASA AMES Research Center), K. B. Knudsen (Energy Storage and Distributed Resources Division, LBNL, Department of Chemical Engineering, UC Berkeley), D. A. Dornbusch (NASA Glenn Research Center, Case Western Reserve University), W. R. Bennett (NASA Glenn Research Center), L. J. Abbott (Analytical Mechanics Associates, Inc., NASA AMES Research Center), J. B. Haskins (NASA Ames Research Center), B. D. McCloskey (Energy Storage and Distributed Resources Division, LBNL, Department of Chemical Engineering, UC Berkeley), and J. W. Lawson (NASA Ames Research Center)
- 09:20 348 **Transparent Conducting Oxides As Cathodes in Li-O₂ batteries: A First Principles Computational Investigation** – B. Radhakrishnan (AMA Inc., NASA Ames Research Center) and J. W. Lawson (NASA Ames Research Center)
- 09:40 **Break**
- 10:00 349 **A Long Cycle-Life and High-Rate Magnesium-Ion Battery Anode Enabled through Self-Healing By Near-Room-Temperature Solid-Liquid Phase Transition** – L. Wang, S. S. Welborn, and E. Detsi (School of Engineering, University of Pennsylvania)
- 10:20 350 **Regulating Ca²⁺ Electrolyte Transport and Stability for Calcium Metal Deposition** – N. T. Hahn, K. R. Zavadil (Material, Physical and Chemical Sciences Center, Sandia National Laboratories), J. Self (Lawrence Berkeley National Laboratory), T. Seguin (Energy Technologies Division, Lawrence Berkeley National Laboratory), and K. A. Persson (Lawrence Berkeley National Laboratory, Joint Center for Energy Storage Research)

- 11:00 100 **Impact of Solid Electrolyte Interphase (SEI) Stiffness on Lithium Dendrite Growth** – P. Barai and V. Srinivasan (Argonne National Laboratory)
- 11:20 101 **Na⁺ Ion Transport in Glassy Electrolytes for Solid-State Sodium Ion Batteries: A Reactive Molecular Dynamics Study** – A. M. Dive and S. Banerjee (Washington State University)
- 11:40 102 **Electro-Chemo-Mechanics of Si-C Composite Anode Particles Using Cyclic Voltammetry Simulations** – S. Mohanty, P. Y. Kumbhar, R. K. Annabattula, and N. Swaminathan (Indian Institute of Technology Madras)

Battery Modelling 2 – 14:00 – 16:20**Chair(s): Emily Ryan and Hui Xu**

- 14:00 103 **A First-Principle Study Towards Understanding Surface Reactions in Li-I₂ Batteries** – Z. Liu (Hunan University)
- 14:20 104 **Modeling and Simulations of Aerosol Jet 3D Printed Electrodes for Lithium-Ion Batteries** – J. Li (Missouri University of Science and Technology), M. Saleh, R. Panat (Carnegie Mellon University), and J. Park (Missouri University of Science and Technology)
- 14:40 105 **Numerically Efficient Algorithm for Solving Pseudo 2-Dimensional Li-Ion Cell Model** – S. Han (SF Motors Inc)
- 15:00 106 **Nonlinear Model Predictive Control Strategies for Optimal Charging of a Lithium-Ion Battery** – S. V. Aduru (BattGenie Inc., Seattle), M. Pathak (BattGenie Inc, Seattle), S. Kolluri (BattGenie Inc, Seattle, University of Washington, Seattle), R. D. Braatz (Massachusetts Institute of Technology), and V. R. Subramanian (BattGenie Inc., Seattle, University of Washington)
- 15:20 107 **Efficient Third-Party Abstraction of Lithium-Ion Batteries for Asset Modeling** – M. Rogall (University of Warwick, EDF Energy), D. Greenwood, A. Barai, R. Bhagat (University of Warwick), P. Luk (Cranfield University), and M. Bruccoli (EDF Energy)
- 15:40 108 **Lithium Ion Batteries and Next Generation Energy Storage Technology - Adoption to Aircraft and Aerospace** – R. A. Brewer (Lockheed Martin)
- 16:00 109 **Addressing Space Cell and Battery Safety Design through Standardized Qualification Tests: American Institute of Aeronautics and Astronautics S-144-2018** – B. Reed (WR Scientific Incorporated)

- 10:40 351 **Decoupling the Role of Anion and Solvent on Mg Electrodeposition Efficiency through Interfacial Speciation Determination** – K. R. Zavadil, N. T. Hahn (Sandia National Laboratories), X. Feng, E. Anquillare, J. Guo, T. Seguin (Lawrence Berkeley National Laboratory), and K. A. Persson (Lawrence Berkeley National Laboratory, University of California at Berkeley)
- 11:00 352 **Dendrite-Free Epitaxial Growth of Lithium for Efficient Charging of Li–O₂ Batteries with Improved Cycle Life** – A. Dutta, K. Ito, and Y. Kubo (National Institute for Materials Science)
- 11:20 353 **Intercalation of Solvated Magnesium-Ions into Layered Transition Metal Sulfide for Fast Mg Storage** – Z. Li (Helmholtz Institute Ulm (HIU), Karlsruhe Institute of Technology (KIT)), Z. Zhao-Karger (Helmholtz Institute Ulm (HIU), Karlsruhe Institute of Technology (KIT), Germany), and M. Fichtner (Helmholtz Institute Ulm (HIU), Karlsruhe Institute of Technology (KIT))
- 11:40 354 **Elucidating Zn, Mg, and Ca Electrodeposition Mechanisms in Nonaqueous Electrolytes for Next-Generation Metal Batteries** – K. Ta (University of Illinois at Urbana-Champaign), K. A. See (University of Illinois, Urbana-Champaign), R. Zhang, M. Shin, R. Rooney, E. K. Neumann (University of Illinois at Urbana-Champaign), and A. A. Gewirth (University of Illinois)
- Lone Star A1, Dallas Sheraton Convention Center*
- Lithium Ion Cathodes 3 – 08:00 – 12:20**
Chair(s): David L Wood III and Jimmy-Xuan Shen
- 08:00 355 **Direct Electrodeposition Li-V-Mn-Ni-O Composite Films on Al Foils Toward Li Ion Battery Cathode Materials** – T. Inoue (Nagoya Institute of Technology), S. Z. S. Kure-Chu (Nagoya Institute of Tehnology), Y. Moriguchi, R. Miyazaki, T. Hihara (Nagoya Institute of Technology), and H. Yashiro (Iwate University)
- 08:20 356 **Incorporation of Aluminum into High-Nickel Layered Oxide Cathodes: An Interphase and Structural Study** – J. Li and A. Manthiram (The University of Texas at Austin)
- 08:40 357 **Development of Selenium Substituted Lithium Titanium Sulfide Materials (Li₂TiSe_xS_{3-x}) As Positive Electrodes for Li-Ion Batteries** – Y. Celasun (Univ. Grenoble Alpes, CEA, LITEN, F-38054 Grenoble, France), J. F. Colin, D. Peralta, and S. Martinet (CEA, LITEN, F-38054 Grenoble, France)
- 09:00 358 **Processing, Fast Formation, and Performance of Aqueous-Processed Low-Co Cathodes for High-Energy Lithium-Ion Pouch Cells** – D. L. Wood III, M. Wood, C. Mao, J. Li, R. E. Ruther, and Z. Du (Oak Ridge National Laboratory)
- 09:20 359 **A Study of Particle Size Effect on the Voltage Behavior of Li_xNi_{0.5}Mn_{1.5}O₄ Electrode** – Y. Xie (California State University Fresno)
- 09:40 **Break**
- 10:00 360 **A Materials Genome Approach for Discovery of Novel Li-Ion Cathodes** – J. X. Shen (UC Berkeley), K. A. Persson (Lawrence Berkeley National Laboratory), and M. Horton (Lawrence Berkeley National Lab)
- 10:20 361 **A Simple Surface Modification Technique to Improve the Electrochemical Properties of NMC Family Cathode Materials** – M. Ashuri, Q. He (Wanger Institute for Sustainable Energy Research (WISER), Illinois Institute of Technology), and L. Shaw (Illinois Institute of Technology, Wanger Institute for Sustainable Energy Research (WISER))
- 10:40 362 **Surface Modifications on LiCoO₂-Based Cathodes for High-Density Lithium-Ion Batteries with Long Cycle Life** – Z. Feng and T. Holstun (Oregon State University)
- 11:00 363 **High-Voltage Cathode Materials for Li-Ion Batteries; LiNi_{0.5}Mn_{1.5}O₄ Stabilized By Surface Coating** – E. R. Oestli (Norwegian University of Science and Technology), N. P. Wagner (SINTEF Industry), A. M. Svensson, and F. Vullum-Bruer (Norwegian University of Science and Technology)
- 11:20 364 **Solvent-Free Mechano-Fusion Assisted Carbon Coatings for High Capacity Cathode - a Practically Feasible Approach** – V. Selvamani, N. Phattharasupakun, J. Wutthiprom, and M. Sawangphruk (Vidyasirimedhi Institute of Science and Technology)
- 11:40 365 **Influence of Calcination Temperature on the Performance of Li and Mn Rich Li_{1.2}Mn_{0.54}Co_{0.13}Ni_{0.13}O₂ layered Electrode for Lithium Ion Battery** – S. Piraman and S. Alagar (ALAGAPPA UNIVERSITY)
- 12:00 366 **Improved Electrochemical Performance of Al₂O₃-Coated LiNi_{0.6}Mn_{0.2}Co_{0.2}O₂ Cathodes By Atomic Layer Deposition** – X. Wang, J. Cai (University of Arkansas), J. Li (Oak Ridge National Laboratory), and X. Meng (University of Arkansas)
- Lone Star A3, Dallas Sheraton Convention Center*
- Modeling – 08:00 – 12:20**
Chair(s): Venkat R. Subramanian and Partha P. Mukherjee
- 08:00 367 **Modelling the Impact of Manufacturing Uncertainties on Lithium-Ion Batteries** – O. Schmidt (Inst. of Energy & Process Systems Eng., TU Braunschweig, Battery LabFactory Braunschweig), M. Thomitzek (Inst. of Machine Tools & Production Tech., TU Braunschweig, Battery LabFactory Braunschweig), F. Röder (Inst. of Energy & Process Systems Eng., TU Braunschweig, Battery LabFactory Braunschweig), S. Thiede, C. Herrmann (Inst. of Machine Tools & Production Tech., TU Braunschweig, Battery LabFactory Braunschweig), and U. Krewer (Inst. of Energy & Process Systems Eng., TU Braunschweig, Battery LabFactory Braunschweig)

Beyond Lithium Ion 2 – 13:40 – 17:20**Chair(s): Huilin Pan, Linhua Hu and Megan B. Sassin**

- 08:20 **368** **Physical Properties Needed to Enable Extreme Fast Charging of High Energy Density Graphite/NMC Cells** – A. M. Colclasure (National Renewable Energy Laboratory), A. R. Dunlop, S. E. Trask, B. J. Polzin, A. N. Jansen (Argonne National Laboratory), and K. Smith (National Renewable Energy Laboratory)
- 08:40 **369** **“Dead” Lithium: Interface Evolution and Characterization** – D. Tewari, S. Perumaram Rangarajan, and P. P. Mukherjee (Purdue University)
- 09:00 **370** **Impedance Based Electrode Diagnostics of Charge-Discharge Kinetics in Li-Ion Pouch Cells** – S. Perumaram Rangarajan (Purdue University), Y. Barsukov (Texas Instruments Inc.), and P. P. Mukherjee (Purdue University)
- 09:20 **371** **Mixed Mode Growth Model for the Solid Electrolyte Interface (SEI)** – N. Kamyab, J. W. Weidner, and R. E. White (University of South Carolina)
- 09:40 **Break**
- 10:00 **372** **Review of Capacity Fade Models for Lithium-Ion Batteries** – L. Teo (University of Washington), M. Pathak (University of Washington, BattGenie Inc.), A. J. Crawford, V. Viswanathan (Pacific Northwest National Laboratory), D. T. Schwartz (University of Washington), and V. R. Subramanian (University of Washington, Pacific Northwest National Laboratory)
- 10:20 **373** **Li Dendrite Nucleation from First Principles Perspective** – E. P. Kamphaus (Texas A&M University) and P. B. Balbuena (Texas A&M University)
- 10:40 **374** **Theoretical Study of Lithium Electrodeposition on Lithium Metal Anodes** – M. S. Angarita-Gomez (Texas A&M University) and P. B. Balbuena (Texas A&M University)
- 11:00 **375** **Mechanistic Investigations of Interfacial Stochasticity in Lithium Metal Anodes** – A. Verma and P. P. Mukherjee (Purdue University)
- 11:20 **376** **Computational Insights to Charge Transfer Kinetics at the Cathode/Electrolyte Interface** – Y. Li (Northwestern Polytechnical University)
- 11:40 **377** **Mechanism Explaining the Onset of Dendritic Li Electrodeposition Via Considerations of Li-Ion Transport within the SEI Layer** – A. Maraschky and R. Akolkar (Case Western Reserve University)
- 12:00 **378** **Multi-Paradigm Modeling Approach to Simulate the Link between the Fabrication Process and the Performance of Li-Ion Batteries** – A. C. Ngandjong, A. Rucci, E. Primo, T. Lombardo, M. Chouchane, Z. Su, A. Shodiev (LRCS (CNRS&UPJV), RS2E), and A. A. Franco (LRCS (CNRS&UPJV), RS2E, ALISTORE-ERI, Institut Universitaire de France)
- 13:40 **379** **Highly Reversible Reactions in Neutral Aqueous Zinc Battery Systems** – H. Pan, Y. Jin, Y. Shao, J. Liu, D. Reed, and V. Sprenkle (Pacific Northwest National Laboratory)
- 14:00 **380** **Characterising the Structure and Electrochemical Behaviour of Manganese Hexacyanochromate: Highlighting the Role and Importance of Structural Water at Low Potentials.** – S. Wheeler and M. Pasta (University of Oxford)
- 14:20 **381** **Structural and Electrochemical Insights into Iron-Based Fluoro(hydroxy)Phosphate $a_x\text{FePO}_{4y}$ (A= Na, Li; Y= F, OH) As Cathode Materials for Aqueous Batteries** – L. Sharma (Indian Institute of Science, Bangalore), S. Okada (IGSES, Kyushu University), and P. Barpanda (Indian Institute of Science)
- 14:40 **382** **2.5 V Battery with Stripping/Plating of Stainless Steel** – H. Wang (SEE, City University of Hong Kong) and D. Y. W. Yu (City university of Hong Kong)
- 15:00 **383** **Achieving High Capacity at High Rates in Aqueous-Based Zn-Ion Batteries Via Advanced 3D Electrode Design and Mixed-Salt Electrolytes** – M. B. Sassin (U.S. Naval Research Laboratory), J. S. Ko, M. D. Donakowski (Former NRL/NRC Postdoctoral Associate), J. F. Parker (Surface Chemistry Branch (Code 6170)), J. W. Long (U.S. Naval Research Laboratory), and D. R. Rolison (Surface Chemistry Branch (Code 6170))
- 15:20 **384** **Transition Metal Cations Stabilized Layered Vanadate Cathodes for Zinc-Ion Batteries** – C. Liu and G. Cao (University of Washington)
- 15:40 **385** **Lithium Intercalated Layered Manganese Oxide/Reduced Graphene Oxide As the Bifunctional Electrocatalyst for Zn-Air Battery** – S. Kosasang, N. Ma, and M. Sawangphruk (Vidyasirimedhi Institute of Science and Technology)
- 16:00 **386** **Magnesium Chromium Oxide Nanocrystals: Synthesis and Electrochemistry** – L. Hu (JCESR at University of Illinois at Chicago), I. Johnson (University College London), S. Kim (Argonne National Laboratory), G. M. Nolis (JCESR at University of Illinois at Chicago), J. W. Freeland (X-ray Science Division), H. Yoo (Pusan National University), T. T. Fister (Chemical Sciences and Engineering Division), A. Ploszajski, L. McCafferty, T. Ashton (University College London), J. Darr (Department of Chemistry, University College London), and J. Cabana (University of Illinois at Chicago)
- 16:20 **387** **Modelling Mg Storage and Mobility in V_2O_5 and Anatase TiO_2** – K. McColl and F. Corà (University College London)

16:40 388 **Interfacial Behavior of Magnesium Ions at Electrode/Electrolyte Interface during Magnesium Deposition Reaction** – F. Tuerxun, M. Hattori, K. Yamamoto (Kyoto University), T. Mandai (Faculty of Science and Engineering, Iwate University), M. Matsui (Kobe University), Y. Tateyama (National Institute for Materials Science (NIMS)), T. Uchiyama (Kyoto University), T. Takeguchi (Faculty of Science and Engineering, Iwate University), K. Kanamura (Tokyo Metropolitan University), and Y. Uchimoto (Kyoto University)

17:00 389 **A Highly Hierarchical Hollow Sodium Sulfide Nanospheres Embedded in Spongy Carbon Composite As Cathode for High-Rate Performance Sodium-Sulfur Batteries** – C. Wang, H. Wang, and W. Li (Dartmouth College)

Lone Star A1, Dallas Sheraton Convention Center

Diagnostics 2 – 14:00 – 17:20

Chair(s): Xiao-Guang Yang and Zhijia Du

14:00 390 **High-Accuracy Life Estimation of Large-Size Lithium-Ion Battery Operated Under Diversified SOC Change** – N. Ukumori, S. Yamate, and S. Hitomi (GS Yuasa International Ltd.)

14:20 391 **Study of Charge–Discharge Energy Prediction Using Neural Networks for Improving the Operational Economic Efficiency of Lithium-Ion Battery Aggregation** – M. Arima (Daiwa Can Company, Ritsumeikan University), L. Lin, and M. Fukui (Ritsumeikan University)

14:40 392 **Radiation Curing and Its Application in Li Cells** – Z. Du (Oak Ridge National Laboratory), C. J. Janke (Oak Ridge National Lab), J. Li (Oak Ridge National Laboratory), and D. L. Wood III (University of Tennessee)

15:00 393 **An Experimental Analysis on the Impacts of Different Pulse Charging Frequencies on Lithium Ion Batteries** – D. R. Rajagopalan Kannan, P. L. Moss, and M. H. Weatherspoon (Florida A&M University - Florida State University)

15:20 394 **The Effects of Cell Design on Li Plating in Li-Ion Cells: A Real Insight into Cell Design Optimization for Minimizing Li Plating** – M. M. Forouzan (SF Motors Inc), S. Khaleghi Rahimian (SF Motors), S. Han, Y. Liu, and Y. Tang (SF Motors Inc)

15:40 395 **Crack Behavior of Secondary Particles in Li-Ion Battery Electrodes during Lithiation/De-Lithiation Cycles** – Y. Zhang (Shanghai university) and Z. Guo (shanghai university)

16:00 396 **High Energy Density Flexible Battery with Self-Standing Binder- and Collector-Free Electrodes** – O. A. Kuznetsov (Honda Research Institute), E. Pigos (Nanosynthesis Plus Ltd.), G. Chen (Honda Research Institute USA Inc.), and A. R. Harutyunyan (Honda Research Institute USA Inc)

16:20 397 **Climate-Immune Extreme Fast Charging of High Energy Li-Ion Batteries** – X. G. Yang, T. Liu, S. Ge, and C. Y. Wang (Electrochemical Engine Center, Pennsylvania State Univ.)

16:40 398 **Critical Safety Boundaries of Lithium Electrodeposition Against Nanoporous Ceramic Separators** – P. Bai (Washington University in St. Louis)

17:00 399 **Design and Development of 21700 Type Cells for Electric Vehicle Applications** – G. Yang, C. P. Huang, B. Huang, C. Mao, and Y. Liu (SF Motors Inc)



Battery Student Slam 3

Battery

San Antonio Ballroom A, Dallas Sheraton Convention Center

A04 Battery Student Slam Session 3 – 08:10 – 12:00

Chair(s): Feng Lin, Susan A. Odom, Guoying Chen, David Mitlin, Laurence J. Hardwick and Veronica Augustyn

08:10 493 **Photoactive Zn-Air-Batteries Using Cobalt Oxide As the Photocatalyst at the Cathode** – C. Tomon, S. Kalasina, S. Duangdangchote, A. Krittayavathananon, and M. Sawangphruk (Vidyasirimedhi Institute of Science and Technology)

08:20 494 **Polyaniline-Modified Hydrolyzed Polyethylene Separators for High-Performance Lithium-Sulfur Batteries** – S. Tubtimkuna, J. Wutthiprom, P. Chiochan, S. Duangdangchote, A. Krittayavathananon, and M. Sawangphruk (Vidyasirimedhi Institute of Science and Technology)

08:30 495 **Shutdown-Enabled Electrospun Polyimide Composite Film Prepared By Novel Spin-Coating Method with Polyethylene As Separator for Rechargeable Lithium-Ion Batteries** – C. T. Hsieh and C. C. Hu (Department of Chemical Engineering, National Tsinghua Univ.)

08:40 496 **Understanding the Effects of Structural Water in Tungsten Oxide for High Power Electrochemical Capacitor Applications** – J. B. Mitchell (North Carolina State University), N. R. Geise (Stanford University), A. R. Paterson (North Carolina State University), J. S. Ko (NRC Postdoc at the U.S. Naval Research Laboratory), J. W. Long (U.S. Naval Research Laboratory), M. F. Toney (SLAC National Accelerator Laboratory), and V. Augustyn (North Carolina State University)

08:50 497 **Engineering the Low-Temperature Performance of Li-S Batteries** – A. Gupta and A. Manthiram (The University of Texas at Austin)

09:00 498 **The Magnesium-Sulfur Battery with High Rate and Improved Capacity Using Cu Nanoparticle Additives** – P. He, H. O. Ford, L. C. Merrill, and J. L. Schaefer (University of Notre Dame)

09:10 499 **Bioinspired Electrodes for Structural Supercapacitors** – P. Flouda, D. Lagoudas, and J. Lutkenhaus (Texas A&M University)

- 09:20 **500** **Exploring Biomass-Derived Electrode Precursors for Vanadium Redox Flow Batteries** – C. T. C. Wan (Massachusetts Institute of Technology, Joint Center for Energy Storage Research), D. L. Barreiro (Massachusetts Institute of Technology), A. Forner-Cuenca (Massachusetts Institute of Technology, Joint Center for Energy Storage Research), J. W. Barotta (Massachusetts Institute of Technology), Y. M. Chiang (Massachusetts Institute of Technology, Joint Center for Energy Storage Research), F. R. Brushett (Joint Center for Energy Storage Research, MIT, Department of Chemical Engineering, MIT), M. J. Buehler, and F. J. Martin-Martinez (Massachusetts Institute of Technology)
- 09:30 **501** **Effect of Adsorbed Water on the Mechanism of Mg^{2+} Intercalation in Tungsten Oxides from Non-Aqueous Electrolytes** – R. Wang (North Carolina State University), T. Kobayashi (Ames Laboratory), Y. Zhang (Vanderbilt University), P. V. Bonnesen (Oak Ridge National Laboratory), P. T. Cummings (Vanderbilt University), M. Pruski (Ames Laboratory), and V. Augustyn (North Carolina State University)
- 09:40 **Break**
- 10:10 **502** **Origin of Fast Ion Conduction in $Li_{10}GeP_2S_{12}$, a Superionic Conductor** – A. Bhandari and J. Bhattacharya (Indian Institute of Technology Kanpur)
- 10:20 **503** **CNF/S Cathodes for RT Na-S Batteries in Carbonate Electrolyte: Understanding the Role of Sulfur Phase and Solid Electrolyte Interphase** – R. Pai, A. Singh, A. Rafie, and V. Kalra (Drexel University)
- 10:30 **504** **The Electrochemistry of Low-Temperature Molten Quinones for All-Organic Redox Flow Batteries** – B. R. Howell and J. W. Gallaway (Northeastern University)
- 10:40 **505** **Effects of Particle Sizes of Active Materials and Conductive Additive on the Electrochemical Performance of a Semi-Solid Flow Battery** – B. Liu, T. Chen, J. Sun, and M. Zheng (Zhejiang University)
- 10:50 **506** **Failure Analysis of the Rechargeable Porous Zinc Electrode in Alkaline Electrolyte** – M. J. D'Ambrose (Chemical Engineering, The City College of New York), G. G. Yadav, D. Turney (CUNY Energy Institute at the City College of New York), J. W. Gallaway (Northeastern University), M. Nyce (CUNY Energy Institute at the City College of New York), R. J. Messinger (The City College of New York), and S. Banerjee (CUNY Energy Institute at the City College of New York)
- 11:00 **507** **High-Voltage Aqueous Redox Flow Battery Utilizing Metal Coordination Chemistry** – B. Robb and M. P. Marshak (University of Colorado Boulder)
- 11:10 **508** **Predicting the Solubility of Potential Redox Flow Battery Materials Using a Quantitative Structure-Property Relationship Models** – T. M. Suduwella (University of Kentucky, Joint Center for Energy Storage Research), S. Robinson (University of Utah, Joint Center for Energy Storage Research), N. H. Attanayake (University of Kentucky, Joint Center for Energy Storage Research), M. S. Sigman (University of Utah, Joint Center for Energy Storage Research), and S. A. Odom (University of Kentucky, Joint Center for Energy Storage Research)
- 11:20 **509** **Layered Hybrid Catalyst Containing N-Doped Graphene Oxide and Transition Metal Doped MnO_2 with Enhanced Bifunctional Activity for Zinc Air Battery Applications** – A. Mathur and A. Halder (Indian Institute of Technology Mandi)
- 11:30 **Concluding Remarks**

B01 Carbon Nanostructures for Energy Conversion and Storage

Nanocarbons / Battery / Physical and Analytical Electrochemistry
City View 8, Dallas Sheraton Hotel

Energy Storage 1 – 08:00 – 12:00

Chair(s): Avetik R Harutyunyan and Xiulei Ji

- 08:00 **641** **(Invited) Design and Application of Advanced Materials in Electrochemical Energy Storage Systems** – Z. Chen (University of Waterloo)
- 08:20 **642** **Hierarchically Designed 3D-Nanostructures Using Surface Engineered Graphene Shells** – K. K. Sarigamala, S. Shukla (Indian Institute of Technology Bombay), A. Struck (Rhine-Waal University of Applied Sciences), and S. Saxena (Indian Institute of Technology Bombay)
- 08:40 **643** **Polyluminal Modified Carbon Nanotube Electrodes for Electrochemical Capacitors** – J. N'Diaye and K. Lian (University of Toronto)
- 09:00 **644** **(Invited) Fundamental Understanding of Faradaic and Non-Faradaic Processes in Carbon-Based Supercapacitors** – G. S. Hwang (University of Texas at Austin)
- 09:20 **645** **Graphene/Poly(3,4-ethylenedioxythiophene): Polystyrenesulfonate Hybrid Electrodes for All Solid-State Flexible Supercapacitors** – J. Cherusseri (University of Central Florida, Nanoscience Technology Center, UCF), K. Sambath Kumar (University of Central Florida, Nanoscience Technology Center), and J. Thomas (NanoScience Technology Center, UCF, Department of Materials Science and Engineering, UCF)
- 09:40 **Break**
- 10:00 **646** **Carbon Nanotube As Conductive Additive for Lithium Ion Batteries** – J. Kirner, L. Zhang, Y. Qin, A. N. Jansen, and W. Lu (Argonne National Laboratory)
- 10:20 **647** **(Invited) Encapsulating Various Sulfur Allotropes Within Graphene Nanocages for Long-Lasting Lithium Storage** – J. Lu (Argonne National Laboratory)
- 10:40 **Coffee Break**

- 11:00 648 **(Invited) Computational Electrochemistry of Carbon Materials for Energy Storage** – S. S. Jang (Georgia Institute of Technology)
- 11:20 649 **(Invited) Holey Graphene Electrode Architectures** – Y. Lin (National Institute of Aerospace) and J. W. Connell (NASA Langley Research Center)
- 11:40 650 **Biomass Based Porous Carbons As Promising Composite Cathodes for Lithium Sulfur Battery** – A. A. Arie, H. Kristianto (Parahyangan Catholic University), and J. K. Lee (Korea Institute of Science and Technology)

Energy Technology Division Graduate Student Award Address
sponsored by Bio-Logic – 12:00 – 12:20
Chair(s): Jeffrey L. Blackburn

- 12:00 651 **(Energy Technology Division Graduate Student Award Address sponsored by Bio-Logic) Biomass-Derived Carbon Materials for Next-Generation Electrochemical Energy Storage Systems** – Z. Gao and X. Li (University of Virginia)

Energy Storage 2 – 14:00 – 17:00
Chair(s): Min-Kyu Song

- 14:00 652 **(Invited) Carbon Nanostructures for Energy Storage** – A. R. Harutyunyan (Honda Research Institute USA Inc)
- 14:20 653 **A Facile Way to Synthesize Carbon-Coated $\text{LiMn}_{0.7}\text{Fe}_{0.3}\text{PO}_4$ /Reduced Graphene Oxide Sandwich-Structured Composite for Lithium Ion Batteries** – D. Ding, Y. Maeyoshi, M. Kubota, J. Wakasugi (ABRI Co., Ltd.), K. Kanamura (ABRI Co., Ltd., Tokyo Metropolitan University), and H. Abe (ABRI Co., Ltd.)
- 14:40 654 **Influence of Ionic Liquid Electrolyte on Carbon Nanofibres Derived from Oxygen-Functionalized-Graphene for Novel Supercapacitors Electrode** – K. O. Oyedotun, T. M. Masikhwa (University of Pretoria), S. Lindberg, A. Matic (Chalmers University of Technology), P. Johansson (Department of Physics, Chalmers University of Technology), and N. Manyala (University of Pretoria)
- 15:00 655 **(Invited) Directional Flow-Aided Sonochemistry Yields Graphene with Tunable Defects to Provide Fundamental Insight on Sodium Metal Plating Behavior** – D. Mitlin (Clarkson University)
- 15:20 656 **Bipolar Electrochemically Exfoliated Graphene for Supercapacitor Application** – I. Khakpour, A. Rabiei Baboukani (Florida International University), A. Allagui (University of Sharjah), and C. Wang (Florida International University)
- 15:40 **Break**
- 16:00 657 **Ni Wrapped-Carbon Nanofiber Based Anode for High Areal Capacity for Li-Ion Battery** – T. P. Plateau (Missouri University of Science and Technology), S. Sarkar (Missouri University of Science and Technology, Rolla), H. Pham, and J. Park (Missouri University of Science and Technology)

- 16:20 658 **(Invited) Tailoring Mesoporous Carbons and Related Materials for Energy-Storage and Energy-Conversion Applications** – S. Dai (Oak Ridge National Laboratory)
- 16:40 659 **High Performance Supercapacitor Electrode Material from PAN/6FDA-Daba Polymer Blends** – J. P. Ferraris (University of Texas at Dallas), K. J. Balkus Jr. (The University of Texas at Dallas), and S. D. Panangala (University of Texas at Dallas)

BO2 Carbon Nanostructures in Medicine and Biology
Nanocarbons / Organic and Biological Electrochemistry / Sensor
City View 6, Dallas Sheraton Hotel

Carbon Nanotubes 1 – 08:00 – 09:40

Chair(s): Tatiana DaRos and Januka Budhathoki-Uprety

- 08:00 673 **Oxygen-Doped Carbon Nanotubes for Near-Infrared Imaging Probes** – T. Okazaki (CNT-Application Research Center, AIST)
- 08:20 674 **(Invited) Single Luminescent Carbon Nanotubes Interrogate the Live Brain Extracellular Space at the Nanoscale** – L. Cognet (Institut d'Optique & CNRS, Univ. Bordeaux, France)
- 08:40 675 **(Invited) DNA Library Evolution of Carbon Nanotube Molecular Recognition** – M. P. Landry (Chan-Zuckerberg Biohub) and S. Jeong (University of California Berkeley)
- 09:00 676 **(Invited) Aqueous Dispersion and Characterization of Carbon Nanotubes Functionalized By Biomimetic Glycopolymers** – M. Cantwell, K. K. Chan, X. L. Sun, and G. Ao (Cleveland State University)
- 09:20 677 **A Nanobioengineering Frontier for Next-Generation Optical Devices** – A. A. Boghossian (École Polytechnique Fédérale de Lausanne)

Carbon Nanotubes 2 – 10:00 – 12:20

Chair(s): Nicole M Iverson and Daniel Roxbury

- 10:00 678 **(Invited) Advances in NIR Fluorescent Swnt Sensors for Biomedical Applications** – M. Strano (Massachusetts Institute of Technology)
- 10:20 679 **(Invited) Near-Infrared Fluorescence Modulation of Refolded DNA Aptamer-Functionalized Single-Walled Carbon Nanotubes for Optical Sensing** – K. Lee, A. Nojoomi, J. Jeon (University of Texas at Arlington), C. Y. Lee (Ulsan National Institute of Science and Technology), and K. Yum (University of Texas at Arlington)
- 10:40 680 **(Invited) Step-Wise Molecular Self-Assembly on Single-Wall Carbon Nanotube Networks: Towards Development of Delivery Systems of Highly Potent but Difficult to Administer Drugs** – M. F. Islam (Carnegie Mellon University)
- 11:00 681 **(Invited) Targeted Near Infrared Sensing and Imaging with GFP-Nanobody Carbon Nanotube Hybrids** – S. Kruss (Göttingen University)

- 11:20 682 **Protein Biomarker Detection with Carbon Nanotube-Based Sensors** – J. Budhathoki-Uprety (North Carolina State University) and D. A. Heller (Weill Cornell Medicine, Cornell University)
- 11:40 683 **Understanding Corona Exchange Dynamics on Single-Walled Carbon Nanotubes with Multiplexed Fluorescence Monitoring** – R. L. Pinals, D. Yang, W. Cao (University of California, Berkeley), and M. P. Landry (Chan-Zuckerberg Biohub)
- 12:00 684 **Real-Time Near-Infrared Confocal Imaging of Bacterial Cell Division in the Presence of Single-Walled Carbon Nanotubes** – A. Antonucci, N. Schuergers, V. Zubkovs, and A. A. Boghossian (École Polytechnique Fédérale de Lausanne)

Nanocarbon Optoelectronics in Biomedicine – 14:00 – 16:20

Chair(s): Geyou Ao and Sebastian Kruss

- 14:00 685 *(Invited)* **Sequence-Dependent Stability and Fate of DNA-Wrapped Single-Walled Carbon Nanotubes in Mammalian Cells** – M. Gravely, M. M. Safae, and D. Roxbury (University of Rhode Island)
- 14:20 686 **Biomolecular Sensors Based on Microfluidics-Embedded Graphene Field-Effect Transistors** – D. Bouilly, C. M. Bazan, M. Sauvage, and A. Bencherif (Université de Montréal)
- 14:40 687 *(Invited)* **Development and Utilization of an in Vitro Single Walled Carbon Nanotube System to Quantify Extracellular Nitric Oxide Concentration** – N. M. Iverson (University of Nebraska Lincoln), J. A. Stapleton, J. Glas (University of Nebraska-Lincoln), and E. M. Hofferber (University of Nebraska Lincoln)
- 15:00 688 *(Invited)* **Biological Multiphoton Imaging Techniques for Tracking Non-Fluorescent Carbon Nanomaterials** – S. J. Corr (Rice University, Baylor College of Medicine), E. Kakadiaris (RICE UNIVERSITY), M. McDOWELL (Rice University), E. Lewis (Baylor College of Medicine), T. Sonka, A. Anderson (BAYLOR COLLEGE OF MEDICINE), A. Marti (RICE UNIVERSITY), and L. J. Wilson (Rice University Department of Chemistry)
- 15:20 689 **Carbon Nanotube Biohybrids: From Protein Site-Specific Coupling to the Fabrication of Reconfigurable (multi)Sensing Systems and Devices** – M. Palma (Queen Mary University of London)
- 15:40 690 **Directed Evolution of the Optoelectronic Properties of Synthetic Nanomaterials** – B. P. Lambert, A. J. Gillen, N. Schuergers, S. J. Wu, and A. A. Boghossian (École Polytechnique Fédérale de Lausanne)

- 16:00 691 **Progress Towards Single-Walled Carbon Nanotube Applications in Biomedicine and the Exoneration of Toxicity** – D. A. Heller, T. V. Galassi (Weill Cornell Medicine, Cornell University), P. V. Jena (Memorial Sloan Kettering Cancer Center), G. Ao (Cleveland State University), D. Roxbury (University of Rhode Island), M. Zheng (National Institute of Standards and Technology), and R. M. Williams (Memorial Sloan Kettering Cancer Center)

B04

Nano in Latin America

Nanocarbons / Dielectric Science and Technology / Electronics and Photonics

City View 5, Dallas Sheraton Hotel

NANO in Latin America 1 – 09:00 – 09:40

Chair(s): Mauricio Terrones and Ljubisa R Radovic

- 09:00 755 *(Invited)* **Biomass-Derivative Molecules for the Sustainable Synthesis of Carbon-Doped High-Performance Nanostructured Materials** – J. Matos (University of Concepción) and P. S. Poon (UDT-Universidad de Concepción)
- 09:20 756 *(Invited)* **Graphitization of Carbon Obtained from Local Biomass (babassu) and Their Electrochemical Properties** – A. Ghosh (Federal University of Piauí), C. D. A. Razzino (Vale do Paraíba University (UNIVAP)), A. Dasgupta, K. Fujisawa (Pennsylvania State University), J. Cunha (Federal University of Paraíba), A. O. Lobo (Federal University of Piauí, Vale do Paraíba University (UNIVAP)), J. Robinson, M. Terrones (Pennsylvania State University), and B. C. Viana (Federal University of Piauí)

NANO in Latin America 2 – 10:00 – 12:20

Chair(s): Juan Matos and Monica Cerro-Lopez

- 10:00 757 *(Invited)* **A Review of Defects in 2D Metal Dichalcogenides: Doping, Alloys, Interfaces, Vacancies and Their Effects in Catalysis & Optical Emission** – M. Terrones (Pennsylvania State University)
- 10:20 758 *(Invited)* **Synthesis of Helical-CNT and Stacked Graphene-CNF Using a Copper Foil As Catalyst in a Chemical Vapor Deposition System** – J. L. Fajardo-Díaz, E. Muñoz-Sandoval, and F. Lopez-Urias (IPICYT)
- 10:40 759 *(Invited)* **On the Active Sites in the Graphene-Catalyzed Oxygen Reduction Reaction** – L. R. Radovic (Univ Concepcion (Chile) and Penn State Univ (USA))
- 11:00 760 *(Invited)* **Resonance Raman Spectroscopy Studies in 2D and 1D Nanocarbons** – A. G. G. Souza Filho (Universidade Federal do Ceará)
- 11:20 761 *(Invited)* **Nanocarbons Fabricated By CVD: Medical and Electrochemical Applications** – E. Muñoz-Sandoval (IPICYT)

- 11:40 762 **(Invited) Assembly of Electrochemically Reduced Graphene Oxide, at the Nano and Microscales, for the Preparation of Functional Coatings.** – L. F. Chazaro Ruiz (Instituto Potosino de Investigación Científica y Tec), J. A. Quezada Renteria (Instituto Potosino de Investigación Científica y Tec), J. R. Rangel-Mendez (Instituto Potosino de Investigación Científica y Tec), and C. O. Ania (CEMHTI, CNRS (UPR 3079), Univ. Orleans)
- 12:00 763 **(Invited) Oxygen Reduction Reaction at MN4 and MN5 Catalysts - Calculated and Experimental O₂-Fe Binding Energies, Activity Indexes, Volcano Correlations – F. Tasca (Universidad de Santiago de Chile), J. H. Zagal (Universidad de Santiago de Chile), W. Orellana (Universidad Andres Bello), and J. Marco (ROCASOLANO CENTER, MADRID)**

NANO in Latin America 3 – 14:00 – 15:20

Chair(s): Federico Tasca and Luis Felipe Cházaro-Ruiz

- 14:00 764 **(Invited) Tuning the Electrocatalytic Activity of Fe Phthalocyanine Via Axial Ligation to Multiwalled Carbon Nanotubes and Via Ligand Substitution: Electrochemistry of L-Cysteine and L-Cystine** – J. H. Zagal (University of Santiago de Chile)
- 14:20 765 **(Invited) Cyclic Voltammetry of Gold Nanoparticles: Comparative Analysis of Redox, Electronic and Optical Properties** – A. Figueroa-Gonzalez, M. Cerro-Lopez, and M. A. Mendez-Rojas (Fundacion Universidad de las Americas Puebla)
- 14:40 766 **(Invited) Hydrogen Peroxide Electrochemical Sensing Based on a TiO₂ nanotubes Electrode Modified with *Hibiscus Sabdariffa* L. Anthocyanins** – M. Martinez-Pacheco, J. D. Lozada-Ramirez, and M. Cerro-Lopez (Fundacion Universidad de las Americas Puebla)
- 15:00 767 **(Invited) Long Cycling Life Aluminum-Ion Batteries By Nanocarbon Electrode Optimization, a Comparative Study for Sustainability in Rechargeable Batteries** – C. G. Carvajal-Rossainz (Carbomex Nanomateriales SA de CV.), M. Cerro-Lopez, M. A. Mendez-Rojas (Fundacion Universidad de las Americas Puebla), E. Munoz-Sandoval, F. Lopez-Urias (IPICYT), T. A. Espinoza-Lopez, J. Perez-Andrade (Carbomex Nanomateriales SA de CV.), and I. G. Jimenez-Flores (Fundacion Universidad de las Americas Puebla)

B08 Porphyrins, Phthalocyanines, and Supramolecular Assemblies

Nanocarbons / Organic and Biological Electrochemistry
City View 7, Dallas Sheraton Hotel

Biological Systems – 08:00 – 09:40

Chair(s): Koichiro Ishimori and Muniappan Sankar

- 08:00 939 **From Ferrous HRP to Compound I and Back: The Role of Protein and the Mediators in Reversible Redox Transitions** – G. LeVasseur, A. Stettler, D. Chen (Michigan State University), Z. Zhang (Anhui University of Chinese Medicine), and D. A. Proshlyakov (Michigan State University)
- 08:20 940 **Structural Factors for Regulation of Electron Transfer from Cytochrome C to Cytochrome C Oxidase** – K. Ishimori (Hokkaido University)
- 08:40 941 **Bright Quadruplex Nanostructures Using Masked Porphyrin Lanterns** – J. Jayawickramarajah, P. Pathak, and R. S. Vik (Tulane University)
- 09:00 942 **Supramolecular Assemblies Recognized Gastric Cancer Biomarkers in Biological Fluids** – R. I. Stefan-van Staden (INCEMC)
- 09:20 943 **Erythropoietin Accelerates a Cancer Specific Porphyrins' Accumulation** – H. Matsui and H. Kurokawa (University of Tsukuba, Faculty of Medicine)

Porphyrinoid Photo Physics – 10:00 – 12:20

Chair(s): Victor V. Nemykin and Sergei Vinogradov

- 10:00 944 **Tuning up Redox and Photophysical Properties of Donor-Acceptor Dichromophoric Dyads and Triads Toward a Rational Design of New Light-Harvesting Materials** – V. V. Nemykin (University of Manitoba), Y. V. Zatsikha (University of Manitoba), Y. P. Kovtun (Institute of Organic Chemistry), and D. A. Blank (University of Minnesota)
- 10:20 945 **Porphyry-Based Triad with Exceptionally High Magnetic Field Effects (MFE) on Phosphorescence** – D. Andrianov and S. Vinogradov (University of Pennsylvania)
- 10:40 946 **Photophysics of Phosphorus Corroles and Application of the Compounds in Triplet-Triplet Annihilation Upconversion** – J. Zhao (Dalian University of Technology)
- 11:00 947 **Accelerated Charge Separation and Stabilization in a Fused Bis Zinc Porphyrin-Quinone Conjugate Via Cation-Quinone Interaction** – M. B. Thomas, Y. Hu (University of North Texas), H. Wang (University of North Texas), and F. D'Souza (University of North Texas)
- 11:20 948 **Main Group Element Containing Porphyrins in Construction of Photoanodes** – P. K. Poddutoori (University of Minnesota Duluth)
- 11:40 949 **Charged Porphyrin Metal Complexes As Building Units of Ion-Pairing Assemblies and Materials** – H. Maeda (Ritsumeikan University)

- 12:00 950 **Electronic Structure of Metal-Organic Complexes from an Optimally-Tuned Range-Separated Hybrid Functional** – L. Kronik (Weizmann Institute of Science)

Porphyrinoids – 14:00 – 15:20

Chair(s): Tomas Torres and David Sánchez-García

- 14:00 951 **Photophysical and Electrochemical Studies of B-Functionalized Arylamino porphyrins** – K. Prakash, R. Osterloh (University of Houston), M. Sankar (Indian Institute of Technology Roorkee), and K. M. Kadish (University of Houston)
- 14:20 952 **Peripheral π -Extension of Carbazole-Based Porphyrins** – C. Maeda (Okayama University)
- 14:40 953 **Thiophene-Fused Expanded Porphyrins with π -System Switching** – T. Higashino and H. Imahori (Kyoto University)
- 15:00 954 **Novel Porphyrinoids from α,α -Linked Oligopyrroles** – G. Martínez-Edo, C. Casado-Aguilera, G. Anguera (Institut Químic de Sarrià, Universitat Ramon Llull), B. Kauffmann (Institut Européen de Chimie et Biologie), J. I. Borrell, S. Borrós, and D. Sánchez-García (Institut Químic de Sarrià, Universitat Ramon Llull)

B09

Nano for Industry

Nanocarbons / Industrial Electrochemistry and Electrochemical Engineering / Physical and Analytical Electrochemistry / Interdisciplinary Science and Technology Subcommittee / Dielectric Science and Technology
City View 5, Dallas Sheraton Hotel

NANO for Industry 3 – 08:00 – 09:00

Chair(s): Gleb Yushin and Stefan Mastel

- 08:00 971 **Design and Construction of Novel High-Performance Paper-Based Flexible Micro-Supercapacitors** – W. Liu, M. Zhang, and A. Yu (University of Waterloo)
- 08:20 972 **Morphology Controlled MnCo₂O_{4.5} Induced By Graphene Quantum Dots and Their Application in Supercapacitors** – M. Zhang and A. Yu (University of Waterloo)
- 08:40 973 **(Invited) Nano Carbon and Polymeric Materials for Energy Conversion and Storage** – Y. Chen (College of Chemistry, Nankai University)

F01

Industrial Electrochemistry and Electrochemical Engineering General Session

Industrial Electrochemistry and Electrochemical Engineering
Pearl 5, Dallas Sheraton Hotel

Industrial Electrochemistry and Electrochemical Engineering General Session 3 – 08:00 – 11:00

Chair(s): Douglas P. Riemer and John A. Staser

- 08:00 1090 **Conversion of Carbon Dioxide into Valuable Chemicals through Electrochemical Reduction Using Transition Metal Electrocatalysts** – M. Kassie Birhanu, M. C. Tsai, C. T. Chen, A. Woldu Kabsay, T. S. Zeleke, K. Belay Ibrahim, C. J. Huang, W. N. Su, and B. J. Hwang (National Taiwan University of Science and Technology)
- 08:20 1091 **Electrocatalytic Hydrogenation of Biogenic Molecules: Understanding Reactivity Trends** – O. Y. Gutiérrez Tinoco, U. Sanyal, L. C. Meyer, D. M. Camaioni, J. A. Lopez Ruiz, J. Holladay (Pacific Northwest National Laboratory), and J. A. Lercher (Technische Universität München)
- 08:40 1092 **Using Boron-Doped Diamond Electrodes for Organic Synthesis** – S. R. Waldvogel (Johannes Gutenberg University Mainz), J. Haupt, M. Berger, and E. Rodrigo (JGU Mainz)
- 09:00 1093 **Comparison of Electrochemical Degradation of Sulfonamides with BDD and Pt Electrodes** – H. Li, J. Ye, and C. Zhu (IEDA, CAAS)
- 09:20 1094 **“Buried” Surfaces: Membrane-like Coatings for Favorable Electrocatalytic Selectivity** – B. T. Mei (University of Twente), B. Endrodi (University of Szeged - Hungarian Academy of Sciences), V. Smulders (University of Twente), A. Gomes, M. Widlock, N. Simic (Nouryon), G. Mul (University of Twente), and A. Cornell (KTH - Royal Institute of Technology)
- 09:40 **Break**
- 10:00 1095 **Electrochemical Oxidation of Lignin Using a Novel Lead-Free Electrocatalyst** – R. Ghahremani and J. A. Staser (Ohio University)
- 10:20 1096 **Development of Biosensor-Based Device for Urea Concentration Measurement in Industrial Fertilizer Samples** – M. Dagys, V. Gureviciene, and J. Razumiene (Life Sciences Center, Vilnius University, UAB “Bioanalizes sistemas”, Ltd)
- 10:40 1097 **Organic Contamination on Ionic Liquid Polymer Brush and Its Analysis By Raman Spectroscopy** – H. Kanematsu (National Institute of Technology Suzuka College), A. Oizumi (National Institute of Technology, Suzuka College), T. Sato, T. Kamijo, S. Honma (National Institute of Technology, Tsuruoka College), D. M. Barry (Clarkson University, SUNNY CANTON), A. Ogawa, N. Hirai, T. Kogo, D. Kuroda (National Institute of Technology Suzuka College), K. Tsunashima (National Institute of Technology Wakayama College), and M. Yoshitake (National Institute for Materials Science)

Multiscale Modeling, Simulation and Design 3: Enhancing Understanding, and Extracting Knowledge from Data

Industrial Electrochemistry and Electrochemical Engineering / Energy Technology

Pearl 4, Dallas Sheraton Hotel

Multiscale Modeling, Simulation and Design 3: Enhancing Understanding, and Extracting Knowledge from Data - Session 5 – 08:00 – 11:40

Chair(s): Ankur Jain

- 08:00 1152 **(Invited) Differential Reference Concentration Cell Method for Determination of Thermodynamic Factors in Concentrated Binary Electrolytes** – A. Wang, T. Hou, and C. W. Monroe (Department of Engineering Science, University of Oxford)
- 08:40 1153 **Electrochemical Modeling and Simulation of a Three-Electrode Lead Acid Cell** – A. Subramaniam, T. Jang, S. Kolluri (University of Washington), D. Majumdar, R. Charab, F. Trinidad, D. Jimenez (Exide Technologies), and V. R. Subramanian (University of Washington)
- 09:00 1154 **Fast Simulation of Nonlinear Electrochemical Impedance of Lithium-Ion Batteries** – L. Teo (University of Washington), M. Pathak (University of Washington, BattGenie Inc.), T. Jang, M. D. Murbach, D. T. Schwartz (University of Washington), and V. R. Subramanian (University of Washington, Pacific Northwest National Laboratory)
- 09:20 1155 **Incorporating GIS Data into a Battery Performance Model for Electric and Hybrid-Electric Buses** – E. E. Eggleton and D. T. Schwartz (University of Washington)
- 09:40 **Break**
- 10:00 1156 **Power Hardware in the Loop (PHIL) Simulation of Battery Packs** – M. Uppaluri, C. Pathak, S. Kolluri, T. Jang (University of Washington), E. J. Dufek (Idaho National Laboratory), V. R. Subramanian, and D. T. Schwartz (University of Washington)
- 10:20 1157 **A Mass and Charge Conserving Tanks-in-series Model for Lithium-Ion Batteries** – A. Subramaniam (University of Washington), S. Kolluri (University of Washington, BattGenie Inc, Seattle), C. D. Parke (University of Washington), M. Pathak (BattGenie Inc, Seattle), S. Santhanagopalan (National Renewable Energy Laboratory), and V. R. Subramanian (Pacific Northwest National Laboratory, University of Washington)
- 10:40 1158 **Comsol Simulation of Hierarchical Ordered Porous Microstructure Electrode** – M. Azami-Ghadkolai, S. E. Creager, and R. Bordia (Clemson University)
- 11:00 1159 **A Tanks-in-Series Electrochemical Engineering Model for Lithium Sulfur Batteries** – C. D. Parke, A. Subramaniam, S. Kolluri (University of Washington), M. Pathak (BattGenie Inc.), and V. R. Subramanian (University of Washington)

- 11:20 1160 **Investigation on the Role of Coating Layer Thickness in CeO₂ Coated LiMn₂O₄ Particles for Li-Ion Batteries** – Y. Zhu, Y. He, X. Liang, and J. Park (Missouri University of Science and Technology)

Multiscale Modeling, Simulation and Design 3: Enhancing Understanding, and Extracting Knowledge from Data - Session 6 – 14:00 – 15:40

Chair(s): Venkat R. Subramanian and Scott Calabrese Barton

- 14:00 1161 **A Highly Efficient Computational Model of Energy Storage Systems for Microgrid Applications** – D. M. Ajiboye, J. Kimball, R. Landers, and J. Park (Missouri University of Science and Technology)
- 14:20 1162 **(Invited) Joint Time-frequency Analysis of Lithium-ion Batteries Undergoing Dynamic EIS** – D. T. Schwartz (University of Washington)
- 15:00 1163 **(Invited) Lithium Metal Plating and Stripping Stability with a Solid Electrolyte Separator across Length Scales from the nm to the mm** – P. Albertus (University of Maryland)

Hydrogen or Oxygen Evolution Catalysis for Water Electrolysis 5

Energy Technology / Industrial Electrochemistry and Electrochemical Engineering / Physical and Analytical Electrochemistry

State Room 2, Dallas Sheraton Convention Center

Reversible Fuel Cells – 07:55 – 10:10

Chair(s): Nemanja Danilovic and Jing Yu

- 07:55 **Welcoming Remarks**
- 08:00 1460 **(Invited) Highly Active and Durable Ir-Pt Bifunctional Electrocatalyst for Oxygen Evolution and Hydrogen Oxidation Reactions** – N. N. Kariuki, M. Gebhard, A. U. Mane, M. Ferrandon, A. A. Farghaly, J. W. Elam (Argonne National Laboratory), N. Danilovic (Lawrence Berkeley National Laboratory), and D. J. Myers (Argonne National Laboratory)
- 08:30 1461 **Bifunctional PGM-Free Hydrogen Evolution and Oxidation Electrocatalysts for AEM Electrodes** – A. Serov, A. Lubers, S. McKinney (Pajarito Powder, LLC), G. McCool (Pajarito Powder LLC), H. Romero (Pajarito Powder, LLC), M. Odgaard (IRD Fuel Cells), I. Kendrick (Northeastern University), S. Pann, S. Mukerjee (Chemistry and Chemical Biology, Northeastern University), C. B. Capuano, K. Ayers (Nel Hydrogen), and B. Zulevi (Pajarito Powder LLC)
- 08:50 1462 **Experimental Analysis of Operating Conditions of Proton Exchange Membrane Based Unitized Regenerative Fuel Cells for Efficient and Economic Energy Conversion** – Y. N. Regmi (Lawrence Berkeley National Lab), J. Fornaciari (Lawrence Berkeley National Laboratory), M. Wei (Lawrence Berkeley National Lab), D. Myers (Argonne National Laboratory), A. Z. Weber, and N. Danilovic (Lawrence Berkeley National Laboratory)

- 09:10 1463 **Two-Dimensional Nanoframes for High Activity Bifunctional Acidic Oxygen Reduction and Evolution Electrocatalysts** – F. Godinez-Salomon, L. Albiter, and C. P. Rhodes (Texas State University)
- 09:30 1464 **Cups Ultrafine Nanoparticles Anchored into N-Doped Carbon Framework for Bifunctional Water Splitting** – J. Yu (Harbin Engineering University)
- 09:50 1465 **Pt-Mn/C and Pd-Mn/C Nanoparticles As ORR Electrocatalysts** – M. Ahmadi (Cornell university) and H. D. Abruña (Cornell University)
- 08:20 1570 **Probing Acetonitrile Solvation in Perfluorsulfonate Ion Exchange Membrane By in-Situ FTIR** – K. Lou and T. A. Zawodzinski (University of Tennessee, Knoxville, TN, Oak Ridge National Laboratory, Oak Ridge, TN)
- 08:40 1571 **Proton Transport within Acid Aggregates in a Hydrated Precise Sulfophenylated Polyethylene** – B. Paren (University of Pennsylvania), L. Picard (CEA-Grenoble, LITEN/ DEHT/ SCGE/ LGI, France), P. Rannou (CEA-Grenoble, INAC/SPRAM, UMR 5819, France), M. Marechal (CNRS, INAC-SPRAM, CEA), W. Neary, A. Kendrick, J. Kennemur (Florida State University), A. L. Frischknecht (Sandia National Labs), and K. Winey (University of Pennsylvania)
- 09:00 1572 **Thickness Dependence Impact on Proton Transport Proton Properties of Nafion® Thin-Film on Platinum Model Electrode** – T. Uchiyama, X. Gao (Kyoto University), K. Yamamoto (Graduate School of Human and Environmental Studies), N. Takao (Device-functional analysis Department, NISSAN ARC, Ltd.), M. Matsumoto, H. Imai (Device Analysis Department, NISSAN ARC, Ltd.), S. Sugawara (FC-Cubic Technology Research Association), K. Shinohara (Fuel Cell Cutting-edge Research Center (FC-Cubic)), and Y. Uchimoto (Kyoto University)
- 09:20 1573 **Studies on Proton Transmission across Graphene in Proton-Exchange Membrane Structures** – S. Bukola, L. M. Silva (Clemson University), C. Korzeniewski (Texas Tech University), J. M. Harris (University of Utah), and S. E. Creager (Clemson University)
- 09:40 **Break**
- 10:10 1466 **(Invited) Structural Design Via Group Energy Materials for High-Efficient Photoelectrochemical Hydrogen Evolution Reaction** – X. Zheng and Y. Cui (Stanford University)
- 10:40 1467 **Electronic Properties of the Co₃O₄ Photoelectrode: Predictions from First-Principles Calculations** – T. A. Pham (Lawrence Livermore National Laboratory), T. Smart, Y. Ping (University of California, Santa Cruz), and T. Ogitsu (Lawrence Livermore National Laboratory)
- 11:00 1468 **Interface Effects and Band Edge Engineering in Photocatalytic Bi₂WO₆** – E. Bainglass and M. N. Huda (University of Texas at Arlington)
- 11:20 1469 **Methylamine Treated Mn₃O₄ Nanoparticles for Efficient Water Oxidation Catalyst at Neutral Condition** – Y. H. Lee, S. Park, K. G. Lee, M. Y. Lee, K. H. Cho, S. J. Kim, and K. T. Nam (Seoul National University)
- 11:40 1470 **Hydrogen Evolution Reaction Catalyzed By Plasmonic Photo-Electrodes Under Visible Light Illumination** – H. Minamimoto, D. Sato, and K. Murakoshi (Hokkaido University)
- 12:00 1471 **A Conical Nanogenerator Consisted of Multi-Walled Carbon Nanotubes** – V. D. Dao, Y. Jeong, I. Yoon, and H. S. Choi (Chungnam National University)
- 12:20 1472 **The Effect of SrCrO₄ Impurity Phase in (La_{0.75}Sr_{0.25})_{0.95}Cr_xFe_{1-x}O_{3-λ} (LSCrF) Nano-Ceramic Powder Series As Catalyst for the Propane Dehydrogenation** – K. Kucuk (Illinois Institute of Technology(IIT))
- 10:20 1574 **Phosphoric Acid Loss Mechanism of High Temperature Proton Exchange Membranes** – A. S. Lee (Los Alamos National Lab), Y. K. Choe (AIST), I. Matanovic, and Y. S. Kim (Los Alamos National Laboratory)
- 10:20 1575 **Caveat of High Temperature Accelerated Stability Test for Anion Exchange Membranes** – E. J. Park, S. Maurya (Los Alamos National Laboratory), M. Hibbs, C. Fujimoto (Sandia National Laboratory), and Y. S. Kim (Los Alamos National Laboratory)
- 10:40 1576 **Advancement of Perfluorinated Alkaline Exchange Membrane Materials Toward Improved Durability** – D. Strasser (National Renewable Energy Lab), A. Neyerlin (National Renewable Energy Laboratory), K. Meek (National Renewable Energy Lab), Z. R. Owczarzyk, C. M. Antunes, and B. S. Pivovar (National Renewable Energy Laboratory)
- 11:00 1577 **High-Performance Nafion Membrane Modified Using a 1,2,4-Triazole Derivative** – J. D. Kim (National Institute for Materials Science (NIMS)), A. Ohira (National Institute of Advanced Industrial Sci. Technol.), and H. Nakao (National Institute for Materials Science (NIMS))

PEC and Other Systems – 10:10 – 12:40

Chair(s): Hui Xu, John W. Weidner and Xueli Zheng

102

Materials for Low Temperature Electrochemical Systems 5

Energy Technology / Physical and Analytical Electrochemistry
Houston Ballroom B, Dallas Sheraton Convention Center

Membrane – 08:00 – 11:40

Chair(s): Yu Seung Kim and Stephen E Creager

- 08:00 1569 **Bipolar Membrane Development for Fuel Cells and Electrolyzers** – Y. Chen, E. Klein, T. G. Deutsch, and K. C. Neyerlin (National Renewable Energy Laboratory)

11:20 1578 **Synthesis, Characterization and Performance Evaluation of Hybrid Multiblock Copolymers for Proton Exchange Membrane Fuel Cells** – B. Gaur (NATIONAL INSTITUTE OF TECHNOLOGY HAMIRPUR (H.P), INDIA) and S. Awasthi (LOVELY PROFESSIONAL UNIVERSITY, JALANDHAR)

103

Renewable Fuels via Artificial Photosynthesis or Heterocatalysis 4

Energy Technology / Sensor

State Room 3, Dallas Sheraton Convention Center

Carbon Dioxide Conversion 2 – 07:50 – 12:20

Chair(s): Pawel J. Kulesza and Jaejoon Lee

07:50 1649 **Photocatalytic Water Oxidation Using Wide-Gap Semiconductor Modified with First-Low Transition-Metal Oxides Nanoparticles Under Visible Light** – M. Okazaki and K. Maeda (Tokyo Institute of Technology)

08:05 1650 *(Invited)* **Mixed-Metal-Oxide Based Electrocatalysts for Efficient Reduction of Carbon Dioxide** – I. A. Rutkowska and P. J. Kulesza (University of Warsaw)

08:35 1651 *(Invited)* **Electrocatalytic Reduction of CO₂ in Gas-Phase Electrolyzers: Moving Towards a Relevant Use of CO₂** – T. G. Deutsch, Y. Chen, E. Klein, G. Bender, and K. C. Neyerlin (National Renewable Energy Laboratory)

09:05 1652 *(Invited)* **New Mixed-Anion Photocatalysts for Water Splitting and CO₂ Fixation** – K. Maeda (Tokyo Institute of Technology)

09:35 **Break**

09:50 1653 *(Invited)* **Synthesis of Porous Bi Electrocatalysts for Selective Production of Formate from CO₂ and Their Applications** – H. Park (Kyungpook National University)

10:20 1654 *(Invited)* **Mechanistic Studies of the Direct Electrochemical CO₂ Reduction on Non-Metallic MNC Single Site and MNC/Cu Hybrid Catalysts** – P. Strasser (Technical University Berlin)

10:50 1655 *(Invited)* **Structure, Composition, Support, and Electrolyte Effects in CO₂ Electroreduction** – B. Roldan Cuenya (Fritz Haber Institute of the Max Planck Society)

11:20 1656 *(Invited)* **Composition Dependent Performance of Au-Pd Core-Shell Nanocatalysts for CO₂ Electrochemical Reduction** – S. Zhu, X. Qin, and M. Shao (The Hong Kong University of Science and Technology)

11:50 1657 *(Invited)* **Dilute Cu Alloying in Au Nanostructures for Highly Selective and Long-Term Stability of CO₂ Reduction** – J. T. Song, J. Kim, and J. Oh (Korea Advanced Institute of Science and Technology)

Fundamental Studies on Semiconductors 2 – 13:50 – 17:00

Chair(s): Gary Wiederrecht and Sumit Verma

13:50 1658 **Modulation of Excited State Dynamics in Semiconductor Electrodes with Electrical Bias** – G. F. Samu (ELI-ALPS Research Institute, University of Szeged), Á. Balog (University of Szeged), R. A. Scheidt, P. V. Kamat (University of Notre Dame), and C. Janáky (University of Szeged, ELI-ALPS Research Institute)

14:05 1659 *(Invited)* **Ultrafast Studies of Self-Assembled Biomimetic Materials, Metal-Organic-Frameworks, and Plasmonic Metamaterials for Solar Light Harvesting** – G. Wiederrecht (Argonne National Laboratory)

14:35 1660 **Characterization of Water Oxidation Amorphous Thin Film Catalysts By X-Ray *in-Situ* analysis** – G. Kwon (Brookhaven National Laboratory, Northwestern University/Argonne National Laboratory), M. Risch (Georg-August-Universität Göttingen), B. G. Cho (Pohang Accelerator Laboratory), S. Chang, J. Heo (Chung-Ang University), H. Kim (Northwestern University), D. M. Tiede, and J. Kim (Argonne National Laboratory)

15:00 1661 **Charge Carrier Dynamics in Metal-Oxide/Nanocarbon Hybrid Photoelectrodes** – A. Kormányos (University of Szeged), A. Honarfar, T. Pullerits (University of Lund), and C. Janáky (University of Szeged)

15:15 1662 **Probing Adsorption on Platinum Group Metals to Understand Fuel Production Via Electrocatalytic Reduction** – D. Richards, J. Akinola, J. X. Liu, B. Goldsmith, and N. Singh (University of Michigan Ann Arbor)

15:30 1663 **Enhancement of Photocatalytic Hydrogen Generation of Ni Doped CdS Enabled By Improved Ultrafast Charge Transfer** – T. T. Isimjan (Saudi Arabia Basic Industries Corporation) and H. Idriss (UCL (UK))

15:45 1664 **Methanol Production By H₂ Generated from Water Using Integrated Ultra High Concentrated Solar Cells-Electrolysis and Captured CO₂: A Process Development and Techno-Economy Analysis** – T. T. Isimjan (Saudi Arabia Basic Industries Corporation) and H. Idriss (UCL (UK))

16:00 1665 **Solution Combustion Synthesis and Rapid Screening of Complex Oxides and Their Composites for Photoelectrochemical Solar Energy Conversion** – M. K. Hossain (The University of Texas) and K. Rajeshwar (University of Texas)

16:15 1666 **Photocatalytic Overall Water Splitting: Observing H₂ and O₂ Transients with Ni/NiO_x-Modified Mg:SrTiO₃** – B. T. Mei, K. Han, and G. Mul (University of Twente)

16:30 1667 **Defect Engineering of Titania and Hematite Thin Films By Advanced Plasma Deposition Triggers High Photoelectrochemical Water Splitting Activity** – Š. Kment, A. Naldoni (RCPTM, Palacký University), Z. Hubička (Institute of Physics, ASCR, v.v.i.), and R. Zbořil (RCPTM, Palacký University)

- 16:45 1668 **Enhanced Electroreduction of Carbon Dioxide to Methanol Using Zinc Dendrites Pulse-deposited on Silver Foam** – Q. H. Low, N. W. X. Loo (National University of Singapore), F. Calle-Vallejo (IQTUCUB), and B. S. Yeo (National University of Singapore)

105

Heterogeneous Functional Materials for Energy Conversion and Storage 2

High-Temperature Energy, Materials, & Processes / Battery / Energy Technology / Physical and Analytical Electrochemistry
State Room 4, Dallas Sheraton Convention Center

Li-Ion Batteries – 08:00 – 09:40

Chair(s): Nian Liu and Vito Di Noto

- 08:00 1766 **(Keynote) Developing High Voltage Li-Ion Batteries Based on Lithium Cobalt Phosphate (LCP)** – T. R. Jow, J. L. Allen, S. A. Delp (U.S. Army Research Laboratory), D. Liu, C. Kim, M. Cho (CETEES HydroQuébec), A. Guerfi (Research Institute of Hydro-Quebec (IREQ)), and K. Zaghib (CETEES, HydroQuébec)
- 08:40 1767 **(Invited) Hybrid Li-Ion and Li-O₂ battery Enabled By Oxyhalogen-Sulfur Electrochemistry** – X. Wang (UC San Diego) and Y. S. Meng (University of California San Diego)
- 09:20 1768 **Theoretical Investigation of the Effects of Metal Cations on Oxygen Reduction Reaction in Non-Aqueous Li-Air Batteries** – S. H. Rawal (Louisiana State University), B. Drewry (University of Arkansas), W. A. Shelton, and Y. Xu (Louisiana State University)

Solid-state and non-Li Batteries – 10:00 – 12:20

Chair(s): Taiguang Richard Jow and Vito Di Noto

- 10:00 1769 **(Keynote) Effect of Architecturally Expressed Electrodes and Catalysts on Energy Storage/Conversion in Aqueous Electrolytes** – D. R. Rolison (U.S. Naval Research Laboratory), J. F. Parker (Surface Chemistry Branch (Code 6170), U.S. Naval Research Laboratory), J. S. Ko (Former NRL/NRC Postdoctoral Associate), B. J. Hopkins (NRL/National Research Council Postdoctoral Associate), C. N. Chervin (U.S. Naval Research Laboratory), P. A. DeSario (Surface Chemistry Branch, Code 6170, U.S. Naval Research Laboratory), M. B. Sassin, and J. W. Long (U.S. Naval Research Laboratory)
- 10:40 1770 **(Invited) Polymer-Ceramic Composite Electrolytes for All-Solid-State Lithium-Ion Batteries** – H. Yang and N. Wu (West Virginia University)
- 11:20 1771 **(Invited) Directing Mg-Storage Chemistry in Organic Polymers Toward High-Energy Mg Batteries** – H. Dong, Y. Liang, and Y. Yao (University of Houston)
- 12:00 1772 **Suppressing Reactivity of Sulfides in Solution Processing Enables Scalable Manufacturing of Thin, Flexible Solid-State Electrolytes** – D. H. S. Tan, A. Banerjee, Z. Deng, E. Wu, H. Nguyen, J. M. Doux, X. Wang, J. H. Cheng, S. P. Ong, S. Meng, and Z. Chen (University of California, San Diego)

Zinc-air Batteries – 14:00 – 15:20

Chair(s): Vito Di Noto and Nian Liu

- 14:00 1773 **(Invited) Next-Generation Zinc-Air Batteries: Progresses, Challenges, and Perspectives** – N. Xu (Donghua University, University of Louisiana at Lafayette), J. Qiao (Donghua University), and X. D. Zhou (University of Louisiana at Lafayette)
- 14:40 1774 **(Invited) Nanoscale Material Design of Zinc Anodes for High Energy Rechargeable Aqueous Batteries** – N. Liu (Georgia Institute of Technology)

Capacitors – 15:20 – 16:20

Chair(s): Steven C. DeCaluwe and Wilson K. S. Chiu

- 15:20 1775 **Nanoporous Aluminum Oxide Templates of Arbitrary Thickness on Silicon Carrier Wafer** – G. Scisco (University of Florida), A. Skinner (Mainstream Engineering Corporation), J. J. Hill (Mainstream Engineering Corp.), K. S. Jones (University of Florida), and K. J. Ziegler (Department of Chemical Engineering)
- 15:40 1776 **Construction of NiMoO₄/Polypyrrole Nanocomposites on Carbon Cloth As Advanced Electrodes for High Performance Flexible Supercapacitors** – D. Zhu and J. Wang (Harbin Engineering University)
- 16:00 1777 **Novel Synthesis of Mn-Ni-Co Oxide(MnCO)₂@g-C₃N₄ Ternary Ribbon-like Hetero Nanocomposite for Pseudocapacitor Applications** – N. C. Mawari and S. K. Meher (Malaviya National Institute of Technology, Jaipur, India)

Catalysts – 16:20 – 17:40

Chair(s): Steven C. DeCaluwe and Wilson K. S. Chiu

- 16:20 1778 **Modulating Proton and Electron Transfer Dynamics in Molecular Electrocatalysis Using Membrane-Covered Self-Assembled Monolayers** – J. Mennel, R. Gautam, S. Supakul, and C. J. Barile (University of Nevada, Reno)
- 16:40 1779 **Copper-Cobalt Spinel Nanostructures As Multifunctional Electrocatalysts** – N. C. D. Nath (Dongguk University), H. Park (Kyungpook National University), and J. J. Lee (Dongguk University)
- 17:00 1780 **New Avenues to MOF Derived Cobalt Chalcogenides for Efficient Electrocatalysis** – D. Das and K. Nanda (Indian Institute of Science)
- 17:20 1781 **Binary Cobalt Manganese Oxide Systems for Electrocatalytic Applications** – C. H. Chen (National Sun Yat-sen University)

Sensors for Precision Medicine - Session 5 – 08:00 – 12:00

Chair(s): Leyla Soleymani and Dong-Joo Kim

- 08:00 2113 **(Invited) Using Fast Scan Cyclic Voltammetry to elucidate the mechanism of action of Deep Brain Stimulation** – K. H. Lee (Dept. of Neurologic Surgery, Mayo Clinic)
- 08:40 2114 **Aggressive Prostate Cancer Detection with an 8-Protein Biomarker Panel** – A. L. Jones, L. DhanapalaMudiyanselage (University of Connecticut), T. Baldo (Federal University of São Carlos), M. Sharafeldin (University of Connecticut), C. E. Krause (University of Hartford), N. Lee (George Washington University), and J. F. Rusling (National Univ of Ireland at Galway)
- 09:00 2115 **(Invited) Glucose Sensor Prepared By the Immobilization of Glucose Oxidase Together with Nanocarbons and Prussian Blue Using Electrodeposition Method** – M. Yasuzawa (Tokushima University), H. P. Jhong (National Taiwan University of Science and Technology, Tokushima University), M. Kurashina (Tokushima University), C. H. Wang, and W. H. Chiang (National Taiwan University of Science and Technology)
- 09:40 **Break**
- 10:00 2116 **Engineered Electroactive Solutions for Electrochemical Detection of Volatile Organic Biomarkers Associated with Disease** – C. N. Willis, M. Misra, and S. K. Mohanty (University of Utah)
- 10:20 2117 **(Invited) Facile Nickel Phosphate Nano/Micro Structure As the High-Performance Electrode for Non-Enzymatic Glucose and pH Sensors** – K. M. Razeeb, P. Narayanasamy, and H. Shao (Tyndall National Institute, University College Cork)
- 11:00 2118 **Detection of Pneumonia Volatile Organic Biomarkers Via Nanotube Sensing Platform** – Y. Saffary, L. McKinnon, C. N. Willis, K. Carlson, and S. K. Mohanty (University of Utah)
- 11:20 2119 **(Invited) Closed Bipolar Electrochemistry with Multiplex Optical Readout for Rapid Diagnostics of Sepsis Syndrome Biomarkers** – A. Lopez, C. Oh, and P. W. Bohn (University of Notre Dame)

Sensors for Precision Medicine - Session 6 – 14:00 – 17:40

Chair(s): Ajit Khosla and Peter J Hesketh

- 14:00 2120 **(Invited) Stationary Phase Coatings for a Microfabricated GC Column Integrated with Low Power Ion Trap Mass Spectrometer for Analysis of Volatile Organic Compounds** – T. H. Chang, D. Struk, M. Navaei (Georgia Institute of Technology), V. M. Doroshenko, V. Laiko, E. Moskovets, K. Novoselov (MassTech Inc.), J. M. D. Dimandja, and P. J. Hesketh (Georgia Institute of Technology)
- 14:40 2121 **Towards Precision Medicine: Rapid Microfluidic Isolation of Aptamers for Glycan Targets** – T. R. Olsen, X. Meng, M. Stojanovic, and Q. Lin (Columbia University)
- 15:00 2122 **(Invited) Stochastic Sensors As Screening Tools for Fast and Early Detection of Illnesses** – R. I. Stefan-van Staden (INCEMC)
- 15:40 **Break**
- 16:00 2123 **(Invited) Multi-Material Additive Manufacturing (3D/4D printing)** – A. Khosla, S. Basher (Yamagata University), T. Thundat (University at Buffalo), S. Bhansali (Florida International University), L. A. Nagahara (Johns Hopkins University), M. Kawakami, and H. Furukawa (Yamagata University)
- 16:40 2124 **Electrochemical Quantification of Sulfatase Activity for Point-of-Care Diagnosis** – B. Dang, P. Pham (Xavier University of Louisiana), X. Yue (LSU Health Sciences Center), and Z. Wang (Chemistry, Xavier University of Louisiana)
- 17:00 2125 **(Invited) Microfabrication and Electrochemical Activation of Amorphous Carbon Nitride a-CN_x Working Electrode Integrated in Microfluidic Chip** – M. C. Horny (CNRS C2N, Sorbonne Université), F. Billon (CNRS and Sorbonne Université), J. M. Siaugue, V. Dupuis (Sorbonne Université and CNRS), M. Lazerges (Université Paris Descartes and CNRS), C. Deslouis (CNRS and Sorbonne Université), A. Pailleret (Sorbonne Université and CNRS), and J. Gamby (CNRS C2N and Univ. Paris Saclay)

Author Index

Author Abs No.

A

A. C., Anithaa..... 2090 (M03, Wed)
 Aaron, Douglas 437 (A03, Tue),
 440 (A03, Wed), 443 (A03, Wed)
 Abbas, Saleem..... 1085 (F01, Wed)
 Abbas, Syed Ali 282 (A02, Tue)
 Abbas, Yawar 1200 (G01, Wed)
 Abbott, Daniel 1405 (I01, Mon)
 Abbott, Lauren 347 (A02, Thu)
 Abdelhafiz, Ali 639 (B01, Wed), 850 (B06, Tue),
 850 (B01-09, Tue), 1547 (I02, Wed)
 Abdellahi, Ebtisam..... 1701 (I05, Mon)
 Abdullah, Aoubakr..... 1024 (C01, Wed)
 Abdurrahman, Shahul Hameed..... 120 (A02, Sun)
 Abe, Hidetoshi 268 (A02, Tue), 653 (B01, Thu)
 Abe, Koji 268 (A02, Tue)
 Abe, Ryu 1618 (I03, Tue), 1634 (I03, Tue)
 Abella, Justin 1517 (I02, Tue)
 Abella, Laura 787 (B05, Mon), 790 (B05, Tue)
 Abernathy, Harry 1718 (I05, Tue)
 Abhinav, Vishnuram 2022 (M01, Wed)
 Abney, Michael 871 (B07, Mon)
 Abouatallah, Rami 409 (A03, Mon)
 Abramson, Igor 1046 (D01, Wed)
 Abrenica, Graniel Harne..... 1207 (G02, Tue),
 2221 (Z01, Tue)
 Abuña, Héctor..... 833 (B06, Tue),
 1465 (I01, Thu), 1501 (I02, Mon)
 Abtahi, Ashkan 857 (B07, Sun)
 Accogli, Alessandra 406 (A03, Mon)
 Acharya, Prashant 1451 (I01, Wed)
 Acharyya, Amit 2037 (M01, Wed)
 Achrai, Ben..... 1830 (I06, Wed)
 Achtyl, Jennifer 1032 (D01, Tue)
 Acosta, Gloria 985 (C01, Mon)
 Adams, Jada 199 (A02, Mon)
 Adams, Jim 130 (A02, Sun)
 Addi, Yassine..... 1065 (E01, Wed), 1911 (L01, Tue)
 Adekunle, Abolanle 1876 (K03, Wed)
 Adelowo, Ebenezer 304 (A02, Wed)
 Adhikari, Pashupati 2204 (Z01, Tue)
 Adiga, Prajwal..... 1030 (D01, Mon)
 Adio-Adepoju, Aderinsola..... 2213 (Z01, Tue)
 Aduru, Sai Varun 106 (A01, Thu)
 Adzic, Radoslav 1522 (I02, Tue),
 1672 (I04, Tue), 1785 (I06, Mon)
 Aepuru, Radhamanohar 1289 (I01, Tue)
 Aetukuri, Nagaphani 449 (A03, Wed)
 Afreen, Samira 710 (B03, Mon)
 Afsahi, Foroughazam..... 1552 (I02, Wed)
 Afzali-Ardakani, Ali 58 (A01, Tue)
 Agar, Ertan 441 (A03, Wed)
 Agarwal, Ashish..... 1351 (H02, Wed)
 Agarwal, Harsh 438 (A03, Wed)
 Agarwal, Tarun..... 1182 (G01, Tue)
 Agbo, Peter..... 1637 (I03, Tue)
 Agrawal, Ankit..... 178 (A02, Mon)
 Aguirre, Lupita 2208 (Z01, Tue)
 Ahamad, Salahuddin..... 330 (A02, Wed)
 Ahmad, Habib 2108 (M03, Wed)
 Ahmad Ishfaq, Hafiz..... 1765 (I05, Wed)
 Ahmadi, Kamyar 1891 (L01, Mon)
 Ahmadi, Mahdi 1465 (I01, Thu)
 Ahn, Chi Won..... 239 (A02, Mon)
 Ahn, Chi-Yeong 1503 (I02, Mon),
 1555 (I02, Wed)
 Ahn, Chi-Yeong 631 (B01, Wed)
 Ahn, Hyo-Jun 462 (A04, Wed)
 Ahn, Hyunwoo 218 (A02, Mon)
 Ahn, Jae-Pyoung 462 (A04, Wed)
 Ahn, Jou-Hyeon 462 (A04, Wed)
 Ahunbay, Esra 729 (B03, Tue), 729 (B01-09, Tue)
 Aidun, Ruby 420 (A03, Tue)
 Aihara, Yuichi 163 (A02, Mon)
 Airola, Marc 584 (A06, Tue)

Author Abs No.

Ajiboye, Damola..... 1161 (F04, Thu)
 Akhade, Sneha 1965 (L03, Tue)
 Akimoto, Seiji 889 (B07, Tue)
 Akinbulu, Isaac 2213 (Z01, Tue)
 Akinola, James..... 1662 (I03, Thu)
 Akinwande, Deji 825 (B06, Mon)
 Akkaraju, Giridhar 663 (B01-09, Tue),
 663 (B02, Tue), 665 (B02, Wed),
 1350 (H02, Wed)
 Ako, Takumi..... 854 (B07, Sun)
 Akolkar, Rohan 377 (A02, Thu), 1072 (F01, Wed)
 Akpan, Ekemini 1006 (C01, Tue)
 Aktas, Ozgur 1274 (H01, Tue)
 Akula, Srinu 1747 (I05, Wed)
 Al Mubarak, Zainab 2095 (M03, Wed)
 Al-Zubeidi, Alexander 1912 (L01, Tue)
 Alagar, Srinivasan 365 (A02, Thu)
 Alajlouini, Sami 1270 (H01, Mon)
 Alamgir, Faisal 639 (B01, Wed), 850 (B06, Tue),
 850 (B01-09, Tue), 1929 (L01, Wed)
 Alateeq, Faisal 2049 (M01, Wed)
 Alba-Rubio, Ana 2049 (M01, Wed)
 Alberkant, Jonathan 1364 (H03, Tue)
 Albertus, Paul 1163 (F04, Thu)
 Albin, Sacharia 1218 (G02, Tue)
 Albin, Sacharia..... 2177 (Z01, Tue),
 2178 (Z01, Tue), 2183 (Z01, Tue)
 Albitar, Luis 1463 (I01, Thu)
 Albu, Sergiu 439 (A03, Wed)
 Alcoutlabi, Mataz 184 (A02, Mon),
 185 (A02, Mon), 186 (A02, Mon),
 294 (A02, Tue)
 Aldalur, Itziar 153 (A02, Mon)
 Aldridge, Chase..... 1632 (I03, Tue)
 Ali, Yousuf..... 1397 (I01, Mon), 1446 (I01, Wed),
 1449 (I01, Wed), 1450 (I01, Wed)
 Alia, Shaun 1422 (I01, Tue), 1441 (I01, Tue)
 Alice Francis, Aneeta 1218 (G02, Tue),
 2177 (Z01, Tue), 2178 (Z01, Tue),
 2183 (Z01, Tue)
 Aliverti, Andrea 2093 (M03, Wed)
 Aljafari, Belqasem 616 (B01, Tue),
 616 (B01-09, Tue)
 Alkandry, Hicham 584 (A06, Tue)
 Alkhalidi, Noura 1295 (H01, Wed)
 Allagui, Anis 656 (B01, Thu)
 Allcorn, Eric 551 (A05, Tue)
 Allen, Jan 1766 (I05, Thu)
 Alloin, Fannie..... 546 (A05, Mon), 557 (A05, Tue)
 Alobaidi, Yasir 587 (A06, Tue)
 Alonso, Gabriel 1476 (I02, Sun)
 Alp, E 1500 (I02, Mon)
 Alp, Esen 1499 (I02, Mon)
 Alptekin, John 1015 (C01, Tue)
 Alrashidi, Abdullah 1118 (F03, Tue)
 Altomare, Marco 1204 (G02, Tue),
 2061 (M02, Wed)
 Aluru, Narayana 1145 (F04, Wed),
 1388 (I01, Sun)
 Alvarez, Angel Luis 805 (B06, Sun)
 Amado, Deysi 2228 (Z01, Tue)
 Amara, Raouf 743 (B03, Wed)
 Ambrozik, Stephen 1057 (E01, Wed)
 Amel, Alina 1829 (I06, Wed)
 Amemiya, Shigeru 670 (B02, Wed)
 Amin, Ruhul 244 (A02, Mon)
 Amine, Khalil 179 (A02, Mon), 306 (A02, Wed)
 Aminifazl, Alireza 1017 (C01, Tue)
 Amirasar, Mehdi 998 (C01, Tue)
 Amit, Moran 1374 (H03, Wed)
 Amoli, Vipin 1316 (H02, Mon)
 Amos, Charles 178 (A02, Mon)
 Anai, Yuki 1864 (K02, Tue)
 Anandan, Srinivasan 87 (A01, Wed)
 Anderson, Andrew 688 (B02, Thu)

Author Abs No.

Anderson, Grace 1422 (I01, Tue),
 1441 (I01, Wed)
 Anderson, Lawrence 1477 (I02, Sun)
 Anderson, Morgan 2087 (M03, Wed)
 Anderson, Rachel..... 976 (C01, Mon)
 Anderson, Travis 1274 (H01, Tue)
 Ando, Nobuo 2139 (Z01, Tue), 2140 (Z01, Tue)
 Ando, Takashi 1165 (G01, Mon)
 Andrade, Gabriel..... 448 (A03, Wed)
 Andreescu, Daniel..... 2011 (M01, Tue)
 Andreescu, Silvana 2011 (M01, Tue)
 Andreoli, Alfredo 251 (A02, Tue)
 Andresen, John 1581 (I03, Sun)
 Andrew, Trisha 2085 (M03, Wed)
 Andrianov, Dmitry 945 (B08, Thu)
 Andrukaitis, Ed 571 (A06, Mon)
 Angarita-Gomez, M. 374 (A02, Thu)
 Anguera, Gonzalo 954 (B08, Thu)
 Ania, Conchi 762 (B04, Thu)
 Anil, Athira 1409 (I01, Tue)
 Annabattula, Ratna 102 (A01, Thu)
 Annapurna, Kalyandurg 848 (B06, Tue),
 848 (B01-09, Tue)
 Anquillare, Emma 351 (A02, Thu)
 Ansari, Talha 992 (C01, Mon)
 Anthony, John 872 (B07, Mon)
 Anthopoulos, Thomas..... 227 (A02, Mon)
 Anton, Donald 1389 (I01, Mon)
 Antonucci, Alessandra 661 (B01-09, Tue),
 661 (B02, Tue), 684 (B02, Thu),
 728 (B03, Tue), 728 (B01-09, Tue)
 Antunes, C. 1833 (I06, Wed)
 Antunes, Christopher 1576 (I02, Thu)
 Ao, Geyou 676 (B02, Thu), 691 (B02, Thu)
 Aoki, Masahiro 189 (A02, Mon)
 Aoyagi, Koutarou 1952 (L03, Mon)
 Appenzeller, Joerg 826 (B06, Mon)
 Arachchige, Indika 1630 (I03, Tue)
 Arakawa, Shigekazu 1043 (D01, Wed)
 Arase, Hidekazu 148 (A02, Mon), 285 (A02, Tue)
 Arasimowicz, Monika 1981 (L04, Tue)
 Arava, Leela Mohana Reddy..... 2039 (M01, Wed)
 Arbiol, Jordi 1613 (I03, Mon)
 Arca, Elisabetta 252 (A02, Tue), 305 (A02, Wed)
 Arcelus, Oier 553 (A05, Tue)
 Arcon, Iztok 62 (A01, Tue)
 Ardel, Gilat 300 (A02, Wed)
 Ardo, Shane 1982 (L04, Tue)
 Ardoin, Sydney 190 (A02, Mon), 613 (B01, Tue),
 613 (B01-09, Tue), 1419 (I01, Tue)
 Ardoin, Sydney 200 (A02, Mon)
 Arehart, Aaron 1263 (H01, Mon)
 Arenz, Matthias 1554 (I02, Wed)
 Argade, Gaurav 1002 (C01, Tue)
 Arges, Christopher 1828 (I06, Wed)
 Argun, Avni 1852 (K01, Mon),
 2000 (M01, Mon), 2094 (M03, Wed)
 Aricov, Ludmila 1013 (C01, Tue)
 Arie, Arenst Andreas 650 (B01, Thu)
 Ariga, Katsuhiko 937 (B08, Wed)
 Arima, Masahito 391 (A02, Thu)
 Arisetty, Srikanth 1533 (I02, Wed)
 Arlt, Tobias 539 (A05, Mon)
 Armand, Michel 153 (A02, Mon)
 Armstrong, Beth 514 (A05, Sun)
 Árnadóttir, Líney 995 (C01, Tue), 1001 (C01, Tue)
 Arnauts, Sophia 1227 (G02, Wed)
 Arnold, Michael 712 (B03, Tue),
 846 (B06, Tue), 847 (B06, Tue)
 Arnold, Michael 695 (B03, Mon)
 Arroyo, Iker 1232 (G03, Tue)
 Arthur, David 957 (B09, Wed)
 Arthur, Ebenzer 1692 (I04, Tue)
 Artur, Camille 1891 (L01, Mon),
 1896 (L01, Mon)

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Arumugam, Prabhu	2001 (M01, Mon), 2078 (M03, Tue), 2098 (M03, Wed), 2106 (M03, Wed), 2107 (M03, Wed)	Baek, Jong-Beom	633 (B01, Wed)	Barillaro, Giuseppe	748 (B03, Wed), 2096 (M03, Wed), 2112 (M03, Wed)
Aryana, Kiumars	1171 (G01, Mon)	Baena Moncada, Angélica	1496 (I02, Sun)	Barkholtz, Heather	605 (A06, Wed)
Asadi, Hamid	2070 (M03, Tue)	Bag, Sankar	2035 (M01, Wed)	Barkholtz, Heather	569 (A06, Wed)
Asakura, Kiyotaka	1525 (I02, Tue)	Bagheri Hari, Mohiedin	1686 (I04, Tue)	Barman, Sajib	856 (B07, Sun), 1295 (H01, Mon)
Ascencio, Pedro	455 (A03, Wed)	Baghini, Maryam	2022 (M01, Wed)	Barnes, Austin	1511 (I02, Tue)
Aschbrenner, Stefan	1636 (I03, Tue)	Bagri, Prashant	1075 (F01, Wed)	Barnett, Alejandro	1396 (I01, Mon)
Ash, Uri	1521 (I02, Tue)	Bai, Jianming	536 (A05, Mon)	Barnett, Emma	2153 (Z01, Tue)
Ashraf Gandomi, Yasser	437 (A03, Tue)	Bai, Peng	145 (A02, Sun), 398 (A02, Thu)	Barnett, Scott	12 (A01, Sun), 555 (A05, Tue), 1713 (I05, Tue), 1717 (I05, Tue), 1719 (I05, Tue), 1721 (I05, Tue), 1726 (I05, Tue)
Ashton, Thomas	386 (A02, Thu)	Bai, Zhaowen	1516 (I02, Tue)	Barotta, Jack-William	500 (A04, Thu)
Ashuri, Maziar	361 (A02, Thu)	Bai, Zhenyuan	1998 (L04, Wed)	Barpanda, Prabeer	117 (A02, Sun), 121 (A02, Sun), 381 (A02, Thu), 563 (A05, Tue)
Ashuri, Maziar	246 (A02, Tue), 336 (A02, Wed)	Baik, Chae kyung	1440 (I01, Wed)	Barraugh, Collin	1632 (I03, Tue)
Asokan, Muthappan	977 (C01, Mon)	Baik, Kwang Hyeon	1282 (H01, Tue)	Barraza, Isabel	1632 (I03, Tue)
Asokan, Muthappan	978 (C01, Mon), 1015 (C01, Tue)	Baik, Seoyeon	2197 (Z01, Tue)	Barreiro, Diego	500 (A04, Thu)
Asset, Tristan	810 (B06, Sun)	Bainglass, Edan	1468 (I01, Thu), 1596 (I03, Sun)	Barrera, Carlos	2228 (Z01, Tue)
Asteazarán, Mariano	1559 (I02, Wed)	Bajaj, Rajeev	1046 (D01, Wed)	Barrera, Luisa	1639 (I03, Tue)
Atanassov, Plamen	810 (B06, Sun)	Bajdich, Michael	1428 (I01, Wed)	Barrera, Thomas	587 (A06, Tue)
Atanassov, Plamen	1814 (I06, Tue)	Baker, Andrew	1805 (I06, Tue)	Barry, Dana M.	671 (B02, Wed), 1097 (F01, Thu), 1869 (K02, Tue)
Atapour, Masoud	998 (C01, Tue)	Baker, Hanan	721 (B03, Tue)	Barry, Edward	332 (A02, Wed)
Ateba Mba, Jean-Marcel	53 (A01, Tue), 62 (A01, Tue)	Baker, Lane	2005 (M01, Tue)	Barry, Michael	565 (A06, Mon)
Attanayake, N.	508 (A04, Thu)	Baker, Samuel	2225 (Z01, Tue)	Barsukov, Yevgen	370 (A02, Thu)
Attanayake, N. Harsha	266 (A02, Tue), 457 (A03, Wed)	Baker, Sarah	1965 (L03, Tue)	Barton, John	457 (A03, Wed)
Attenkofer, Klaus	536 (A05, Mon)	Bakovic, Sergio	1677 (I04, Tue)	Barzegar, Farshad	614 (B01-09, Tue), 614 (B01, Tue)
Atwa, Marwa	1808 (I06, Tue)	Bala Chandran, Rohini	1639 (I03, Tue), 1898 (L01, Mon)	Başaran, Caner	1071 (F01, Wed)
Atwater, Harry	1212 (G02, Tue), 1223 (G02, Wed)	Balachandran, Janakiraman	1130 (F04, Tue)	Basceri, Cem	1274 (H01, Tue)
Aubin, Joris	1183 (G01, Tue)	Balaji, Nishithan	1675 (I04, Tue)	Basher, Samiul	2123 (M03, Thu)
Audichon, Thomas	1439 (I01, Wed)	Balakrishnan, Manojkumar	1116 (F03, Tue), 1117 (F03, Tue)	Basim, G. Bahar	982 (C01, Mon), 1031 (D01, Tue), 1039 (D01, Tue), 1044 (D01, Wed)
Augustyn, Veronica	488 (A04, Wed), 496 (A04, Thu), 501 (A04, Thu), 2261 (Z03, Mon)	Balbuena, Perla	273 (A02, Tue), 276 (A02, Tue), 279 (A02, Tue), 373 (A02, Thu), 374 (A02, Thu), 1132 (F04, Tue)	Bassani, Dario	869 (B07, Mon)
Auner, Gregory	2039 (M01, Wed)	Balch, Alan	768 (B05, Mon), 769 (B05, Mon)	Basu, Soumendra	1724 (I05, Tue)
Aurbach, Doron	629 (B01, Wed)	Balciünaitė, Aldona	1530 (I02, Tue), 1531 (I02, Tue), 1556 (I02, Wed)	Batara, Nicolas	1212 (G02, Tue)
Aureau, Damien	1213 (G02, Tue), 1220 (G02, Wed), 1230 (G02, Wed)	Balderas, Patricia	2228 (Z01, Tue)	Bathinapatla, Sravani	2044 (M01, Wed)
Auvity, Bruno	1742 (I05, Wed)	Baldo, Thaisa	2114 (M03, Thu)	Battaglia, Vince	182 (A02, Mon)
Aviles Acosta, Jaime	1919 (L01, Wed)	Balozovic, Milos	920 (B08, Wed)	Baturina, Olga	1991 (L04, Wed)
Avinash, Kumar	1351 (H02, Wed)	Balke, Nina	2261 (Z03, Mon)	Baughman, Ray	88 (A01, Wed), 968 (B09, Wed)
Avraham, Eran	629 (B01, Wed)	Balkus, Kenneth	659 (B01, Thu), 1976 (L04, Tue), 1994 (L04, Wed), 1997 (L04, Wed), 2151 (Z01, Tue)	Baumann, Stefan	1728 (I05, Tue)
Awasthi, Swati	1578 (I02, Thu)	Ballauff, Matthias	541 (A05, Mon)	Baumer, Richard	1098 (F02, Mon)
Ayala, Jonathan	184 (A02, Mon), 185 (A02, Mon)	Ballav, Nirmalya	920 (B08, Wed)	Bayatsarmadi, Bitu	1078 (F01, Wed)
Ayala, Paola	716 (B03, Tue)	Ballestas-Barrientos, Alfonso	2056 (M02, Wed)	Bayeh, Anteneh	8 (A01, Sun)
Ayers, Katherine	1390 (I01, Mon)	Balog, Adam	1658 (I03, Thu)	Bazan, Claudia	686 (B02, Thu), 737 (B03, Wed)
Ayers, Kathy	1461 (I01, Thu)	Baltic, Elias	1741 (I05, Wed)	Bazant, Martin	1068 (F01, Wed), 1140 (F04, Wed)
Ayme-Perrot, David	68 (A01, Tue), 489 (A04, Wed)	Baltrus, John	1000 (C01, Tue)	Bazylak, Aimy	1116 (F03, Tue), 1117 (F03, Tue), 1741 (I05, Wed)
Azam, Saad	583 (A06, Tue)	Ban, Chunmei	252 (A02, Tue), 305 (A02, Wed), 313 (A02, Wed)	Beall, Edward	1298 (H02, Mon)
Azami-Ghadkolai, Milad	460 (A04, Wed), 1158 (F04, Thu)	Ban, Hee-Jung	195 (A02, Mon), 196 (A02, Mon)	Beam, Edward	1277 (H01, Tue)
Azimi, Gisele	74 (A01, Wed), 345 (A02, Thu)	Bance-Soualhi, Rachida	1734 (I05, Wed)	Beard, Matthew	872 (B07, Mon)
Aziz, Michael	407 (A03, Mon)	Bandapati, Madhavi	1543 (I02, Wed)	Beaugar, Christian	1972 (L04, Mon)
Azmoodeh, Danny	1070 (F01, Wed)	Bandarenka, Hanna	1349 (H02, Wed)	Bechu, Solene	1220 (G02, Wed)
Azoulay, Jason	1237 (G03, Tue)	Bandeira, Nuno	1386 (I01, Sun)	Beck, Victor	436 (A03, Tue)
Azra, Charly	1829 (I06, Wed)	Bandi, Ramalingam	50 (A01, Tue)	Becker, James	1834 (K01, Mon)

B

Baba, Kamal	918 (B08, Wed), 919 (B08, Wed)
Baboli, Mohadeseh	1216 (G02, Tue)
Babu, Binson	32 (A01, Mon), 298 (A02, Wed)
Baca, Ehren	1195 (G01, Wed), 1196 (G01, Wed)
Bachilo, Sergei	696 (B03, Mon), 701 (B03, Mon), 706 (B03, Mon), 715 (B03, Tue)
Back, Oliver	918 (B08, Wed)
Badia, Antonella	68 (A01, Tue)
Badrouine, Djoumana	1220 (G02, Wed)
Bae, Chulsung	1822 (I06, Wed), 1957 (L03, Tue)
Bae, Jaemin	218 (A02, Mon)
Bae, Jinho	1266 (H01, Mon), 1291 (H01, Wed)
Bae, Jong-yong	1179 (G01, Mon)
Baek, Hyeonwoo	1483 (I02, Sun)
Baek, Jong Ung	1170 (G01, Mon)

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Bellynck, Sebastien.....	1979 (L04, Tue)	Blackburn, Jeffrey.....	623 (B01, Wed), 627 (B01, Wed), 636 (B01, Wed), 724 (B03, Tue), 727 (B03, Tue), 820 (B06, Mon), 872 (B07, Mon), 1248 (G03, Wed)	Boyer, Mathew.....	99 (A01, Thu), 1947 (L03, Mon)
Beltran, Diana.....	1811 (I06, Tue)	Blanchard, Gary.....	1983 (L04, Tue)	Braatz, Richard.....	106 (A01, Thu)
Ben Barak, Ido.....	486 (A04, Wed)	Blanchard, Pierre-Yves.....	1492 (I02, Sun), 1986 (L04, Tue)	Bradford, Philip.....	488 (A04, Wed)
Ben Yahia, Hamdi.....	244 (A02, Mon)	Blanchard, Sébastien.....	1990 (L04, Wed)	Bradshaw, Liam.....	534 (A05, Mon)
Ben-Yehuda, Chaya.....	1829 (I06, Wed)	Blanco, Maria.....	296 (A02, Wed), 329 (A02, Wed)	Brady, Nicholas.....	1122 (F04, Tue)
Benavides, Roberto.....	1566 (I02, Wed)	Blank, David.....	944 (B08, Thu)	Braga, Filipe.....	119 (A02, Sun)
Benavidez, Angelica.....	1678 (I04, Tue)	Blayac, Sylvain.....	245 (A02, Mon), 1373 (H03, Mon)	Branagan, Sean.....	1050 (E01, Wed)
Bencherif, Amira.....	686 (B02, Thu), 737 (B03, Wed)	Bleiner, Davide.....	1992 (L04, Wed)	Brandell, Daniel.....	1943 (L03, Mon)
Bender, Guido.....	1512 (I02, Tue), 1651 (I03, Thu)	Bliley, Jacqueline.....	666 (B02, Wed)	Brankovic, Stanko.....	1891 (L01, Mon), 1896 (L01, Mon)
Bender, Guido.....	1437 (I01, Wed), 1540 (I02, Wed), 1541 (I02, Wed)	Bloom, Ira.....	254 (A02, Tue), 258 (A02, Tue), 599 (A06, Wed)	Brant, Jacilynn.....	1322 (I02, Tue)
Bender, Timothy.....	921 (B08, Wed)	Blum, Monica.....	523 (A05, Sun)	Brant, Kaylin.....	1518 (I02, Tue)
Bendickson, Lee.....	1895 (L01, Mon)	Bo, Carles.....	1386 (I01, Sun)	Branzoi, Florina.....	1013 (C01, Tue)
Bengasi, Giuseppe.....	919 (B08, Wed)	Bo, Jin.....	801 (B05, Tue), 801 (B01-09, Tue)	Braun, Artur.....	1201 (G02, Tue)
Bengasi, Giuseppe.....	918 (B08, Wed)	Boardman, Richard.....	1389 (I01, Mon)	Braun, Jeffrey.....	1281 (H01, Tue)
Benner, Jingru.....	1538 (I02, Wed)	Bobaru, Florin.....	999 (C01, Tue)	Braun, Robert.....	1729 (I05, Tue)
Bennett, William.....	347 (A02, Thu)	Bobb-Semple, Dara.....	1186 (G01, Tue)	Braun, Trevor.....	1051 (E01, Wed), 1059 (E01, Wed), 1123 (F04, Tue)
Bent, Stacey.....	1186 (G01, Tue)	Bobev, Svilen.....	464 (A04, Wed)	Brennan, Michael.....	979 (C01, Mon), 980 (C01, Mon)
Benvegna, Dominic.....	1046 (D01, Wed)	Bodart, Côme.....	1250 (G03, Wed)	Brett, Dan.....	1473 (I02, Sun), 1474 (I02, Sun)
Beraud, Anouk.....	737 (B03, Wed)	Bodart Leguen, Come.....	1878 (K03, Wed)	Brett, Daniel.....	64 (A01, Tue), 512 (A05, Sun), 518 (A05, Sun), 543 (A05, Mon), 1535 (I02, Wed)
Bergemann, Kevin.....	739 (B03, Wed)	Boge, Lars-Arne.....	125 (A02, Sun), 816 (B06, Mon)	Brewer, Roger.....	108 (A01, Thu)
Berger, Felix.....	698 (B03, Mon), 736 (B03, Wed)	Boghossian, Ardemis.....	660 (B02, Tue), 660 (B01-09, Tue), 661 (B01-09, Tue), 661 (B02, Tue), 662 (B01-09, Tue), 662 (B02, Tue), 677 (B02, Thu), 684 (B02, Thu), 690 (B02, Thu), 720 (B03, Tue), 728 (B01-09, Tue), 728 (B03, Tue), 729 (B03, Tue), 729 (B01-09, Tue)	Brezesinski, Torsten.....	1225 (G02, Wed)
Berger, Michael.....	1092 (F01, Thu)	Bohossian, Ardemis.....	660 (B02, Tue), 660 (B01-09, Tue), 661 (B01-09, Tue), 661 (B02, Tue), 662 (B01-09, Tue), 662 (B02, Tue), 677 (B02, Thu), 684 (B02, Thu), 690 (B02, Thu), 720 (B03, Tue), 728 (B01-09, Tue), 728 (B03, Tue), 729 (B03, Tue), 729 (B01-09, Tue)	Bridges, Craig.....	20 (A01, Mon), 248 (A02, Tue), 264 (A02, Tue), 553 (A05, Tue)
Berhaut, Christopher.....	540 (A05, Mon)	Bohn, Paul.....	2119 (M03, Thu)	Brisard, Gessie.....	1593 (I03, Sun)
Bernardon, Paolo.....	251 (A02, Tue)	Boillat, Pierre.....	1810 (I06, Tue)	Brischetto, Martin.....	1211 (G02, Tue)
Bernasconi, Roberto.....	2093 (M03, Wed)	Bolam, Ron.....	1048 (E01, Wed)	Brito de Souza, Camila.....	752 (B04, Tue), 752 (B01-09, Tue)
Bertazzoli, Rodnei.....	2252 (Z02, Mon)	Boles, Steven.....	253 (A02, Tue)	Broadbridge, Christine.....	36 (A01, Mon)
Bertin, Erwan.....	1808 (I06, Tue)	Bonacin, Juliano.....	1407 (I01, Tue)	Broekmann, Peter.....	1060 (E01, Wed)
Bertz, Morten.....	1127 (F04, Tue)	Bonakala, Satyanarayana.....	1130 (F04, Tue)	Brogan, Lee.....	1055 (E01, Wed)
Besnard, Nicolas.....	537 (A05, Mon)	Bonnesen, Peter.....	501 (A04, Thu)	Brohmman, Maximilian.....	736 (B03, Wed)
Besser, Ronald.....	1479 (I02, Sun)	Bonnett, Jeff.....	456 (A03, Wed)	Brooks, Christopher.....	1070 (F01, Wed)
Besteiro, Lucas.....	1617 (I03, Tue)	Bonville, Leonard.....	1521 (I02, Tue), 1532 (I02, Wed), 1549 (I02, Wed)	Brothers, Michael.....	1370 (H03, Wed)
Betancor-Abreu, Abenchara.....	998 (C01, Tue)	Bordia, Rajendra.....	460 (A04, Wed), 1158 (F04, Thu)	Brouwer, Jack.....	2187 (Z01, Tue)
Bethapudi, Viswanath Sasank.....	1474 (I02, Sun)	Borisevich, Albina.....	264 (A02, Tue)	Broux, Thibault.....	468 (A04, Wed)
Beyenal, Haluk.....	1838 (K01, Mon), 1844 (K01, Mon), 2002 (M01, Mon)	Börner, Markus.....	567 (A06, Mon)	Brown, Dennis.....	1500 (I02, Mon)
Beyer, Frederick.....	157 (A02, Mon)	Börner, Markus.....	165 (A02, Mon)	Brown, Steven.....	1105 (F03, Tue)
Bhagat, Rohit.....	107 (A01, Thu)	Borovkov, Victor.....	900 (B08, Tue)	Browning, James.....	526 (A05, Sun), 1870 (K02, Tue)
Bhandari, Arihant.....	502 (A04, Thu)	Borrás, Fernando.....	805 (B06, Sun)	Browning, Katie.....	526 (A05, Sun)
Bhansali, Shekhar.....	2102 (M03, Wed), 2103 (M03, Wed), 2123 (M03, Thu)	Borrell, José I.....	954 (B08, Thu)	Bruce, Peter.....	558 (A05, Tue)
Bhardwaj, Kirti.....	1938 (L02, Tue)	Borrós, Salvador.....	954 (B08, Thu)	Brucoli, Maria.....	107 (A01, Thu)
Bhargava, Saket.....	1070 (F01, Wed), 1624 (I03, Tue)	Borsali, Redouane.....	1904 (L01, Tue)	Brushett, Fikile.....	410 (A03, Mon), 445 (A03, Wed), 457 (A03, Wed), 500 (A04, Thu), 1105 (F03, Tue)
Bhattacharya, Jishnu.....	502 (A04, Thu)	Borup, Rod.....	1792 (I06, Mon), 1805 (I06, Tue)	Bryantsev, Vyacheslav.....	1568 (I02, Wed)
Bhattacharya, Shantanu.....	81 (A01, Wed)	Boryczka, Jennifer.....	2091 (M03, Wed)	Bucher, Jan.....	1554 (I02, Wed)
Bhide, Ashlesha.....	1366 (H03, Tue)	Bos, Tom.....	986 (C01, Mon)	Büchi, Felix.....	1810 (I06, Tue)
Bhonge, Kaustubh.....	1 (A01, Sun)	Boscher, Nicolas.....	918 (B08, Wed), 919 (B08, Wed)	Buchsbaum, Steven.....	67 (A01, Tue), 708 (B03, Mon)
Bhowmick, Tynee.....	2026 (M01, Wed)	Boschetti, Micol.....	251 (A02, Tue)	Buckalew, Bryan.....	1125 (F04, Tue)
Bhunia, Asamanjoy.....	2224 (Z01, Tue)	Botka, Bea.....	699 (B03, Mon)	Buckley, D. Noel.....	418 (A03, Tue), 439 (A03, Wed)
Bi, Wenli.....	1499 (I02, Mon), 1500 (I02, Mon)	Botte, Gerardine.....	1686 (I04, Tue), 2023 (M01, Wed)	Budhathoki-Uprety, Januka.....	682 (B02, Thu), 721 (B03, Tue)
Bianchini, Federico.....	70 (A01, Wed)	Botton, Gianluigi.....	1978 (L04, Tue)	Budhraj, Vinay.....	979 (C01, Mon), 980 (C01, Mon)
Bidal, Jennifer.....	151 (A02, Mon)	Bottum, Kai.....	1300 (H02, Mon)	Buehler, Markus.....	500 (A04, Thu)
Biddinger, Elizabeth.....	1582 (I03, Sun)	Boucher, Dylan.....	1203 (G02, Tue), 1643 (I03, Mon)	Buenaventura, Ayla.....	1861 (K02, Tue)
Bieker, Peter.....	165 (A02, Mon)	Bouilly, Delphine.....	686 (B02, Thu), 737 (B03, Wed)	Buffeteau, Thierry.....	869 (B07, Mon)
Bienen, Fabian.....	1647 (I03, Wed)	Bourguignon, Natalia.....	2103 (M03, Wed)	Bui, Cuong.....	548 (A05, Mon)
Biener, Juergen.....	436 (A03, Tue), 832 (B06, Tue)	Bourmaud, Claire.....	720 (B03, Tue)	Bui, Liliya.....	1922 (L01, Wed)
Biener, Monika.....	832 (B06, Tue)	Boutemy, Muriel.....	1213 (G02, Tue), 1220 (G02, Wed), 1224 (G02, Wed), 1230 (G02, Wed)	Bukola, Saheed.....	813 (B06, Mon), 1573 (I02, Thu)
Bienkowski, Krzysztof.....	1981 (L04, Tue)	Bowen, Jacob.....	1701 (I05, Mon)	Bulmer, John.....	965 (B09, Wed)
Bienvenu, Lindsey.....	177 (A01, Mon)	Boyd, James.....	610 (B01, Tue), 610 (B01-09, Tue)	Bun, Kheam.....	2179 (Z01, Tue), 2180 (Z01, Tue)
Bilheux, Hassina.....	519 (A05, Sun)	Boyd, Shelby.....	2261 (Z03, Mon)	Bunyanidhi, Panyawee.....	170 (A02, Mon)
Bilheux, Jean.....	519 (A05, Sun)			Buratto, Steven.....	1511 (I02, Tue)
Billon, Florence.....	2125 (M03, Thu)			Bures, Filip.....	837 (B06, Tue)
Binici, Esra.....	79 (A01, Wed)			Burr, Patrick.....	515 (A05, Sun)
Birgersson, Erik.....	1151 (F04, Wed)			Burrell, Anthony.....	313 (A02, Wed)
Birss, Viola.....	1808 (I06, Tue)			Burrows, Cynthia.....	1908 (L01, Tue)
Bisbee, Cora.....	2153 (Z01, Tue)				
Bishop, Douglas.....	1165 (G01, Mon)				
Biswas, Kaushik.....	848 (B06, Tue), 848 (B01-09, Tue)				
Biswas, Sanjay.....	141 (A02, Sun)				
Bisztyga-Szklarz, Magdalena.....	1550 (I02, Wed)				
Bizuneh, Girum.....	271 (A02, Tue), 1459 (I01, Wed)				

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Butson, Joshua	1706 (I05, Mon)	Carson, Oliver	198 (A02, Mon)	Chang, Yu-Chung	8 (A01, Sun)
Byrne, Conor	11 (A01, Sun)	Carter, C.	1699 (I05, Mon)	Chang, Yu-Hao	1304 (H02, Mon)
Bystricky, Pavel	965 (B09, Wed)	Carter, C. Barry	1699 (I05, Mon)	Chang, Yu-Hsiu	302 (A02, Wed)
Byun, Doyoung	28 (A01, Mon)	Carter, Rachel	578 (A06, Tue)	Chanlek, Narong	275 (A02, Tue)
Byun, Seoungwoo	210 (A02, Mon), 228 (A02, Mon), 511 (A05, Sun)	Carter, Rachel	598 (A06, Wed)	Chao, Chi-Yang	217 (A02, Mon)
C		Carvajal-Rossainz, Christian	767 (B04, Thu)	Chao, Shih-Hsuan	1032 (D01, Tue)
Caballero, Ruben	778 (B05, Mon)	Carvalho, Jancineide	754 (B04, Tue), 754 (B01-09, Tue)	Chao, Zhen	227 (A02, Mon)
Cabana, Jordi	386 (A02, Thu)	Carvalho, Sammy	2043 (M01, Wed), 2045 (M01, Wed), 2068 (M02, Wed)	Chaoui, Hicham	1089 (F01, Wed)
Cabo-Fernandez, Laura	524 (A05, Sun)	Casado-Aguilera, Carlos	954 (B08, Thu)	Chapon, Patrick	1220 (G02, Wed)
Cadiou, François	537 (A05, Mon)	Casale, Mariana	1758 (I05, Wed)	Charab, Rayan	1153 (F04, Thu)
Cai, Chao	2202 (Z01, Tue)	Cashen, Ryan	1039 (D01, Tue)	Charbonneau, Micael	1253 (G03, Wed)
Cai, Jiyu	131 (A02, Sun), 366 (A02, Thu)	Cassenti, Brice	1736 (I05, Wed)	Charoen-amornkitt, Patcharawat	1928 (L01, Wed)
Cai, Jiyu	136 (A02, Sun), 306 (A02, Wed)	Castaneda, Homero	987 (C01, Mon)	Chart, Yvonne	1713 (I05, Tue), 1719 (I05, Tue)
Cai, Mei	112 (A02, Sun)	Castanheira, Luis	64 (A01, Tue)	Chassagneux, Yannick	719 (B03, Tue), 743 (B03, Wed)
Cai, Rong	1905 (L01, Tue)	Castano, Carlos	1899 (L01, Mon)	Chatenet, Marian	1972 (L04, Mon)
Cai, Shuangwei 1028 (C01, Wed), 1029 (C01, Wed)		Castro Luna, Ana Maria	1559 (I02, Wed)	Chatterjee, Sanghamitra	2003 (M01, Mon), 2081 (M03, Tue), 2109 (M03, Wed), 2110 (M03, Wed)
Cai, Ting	586 (A06, Tue)	Cavalheiro, Gabriel	573 (A06, Mon)	Chattot, Raphaël	1544 (I02, Wed)
Cai, Wenting	788 (B05, Tue), 790 (B05, Tue)	Cavaliere, Sara	1975 (L04, Tue)	Chaudhary, Preeti	1458 (I01, Wed)
Cai, Xiaosheng	1894 (L01, Mon)	Cavallaro, Kelsey	341 (A02, Wed)	Chaudhri, Nivedita	906 (B08, Tue), 906 (B01-09, Tue)
Cai, Yiyu	873 (B07, Mon), 1926 (L01, Wed)	Cavallo, Luigi	227 (A02, Mon)	Chauhan, Vedang	1538 (I02, Wed)
Cai, Yun	1504 (I02, Mon)	Cave, Gareth	1073 (F01, Wed)	Chauvet, Fabien	1061 (E01, Wed)
Caillon, Alexis	1377 (H03, Wed)	Ceccarelli, Raino	728 (B01-09, Tue), 728 (B03, Tue)	Chazaro Ruiz, Luis	762 (B04, Thu)
Calabrese Barton, Scott	1147 (F04, Wed)	Cedano, Mario	1877 (K03, Wed), 2214 (Z01, Tue), 2220 (Z01, Tue)	Cházaro-Ruiz, Luis	2245 (Z02, Mon)
Caldwell, Gabe	1526 (I02, Tue)	Cedeño López, Alena	1060 (E01, Wed)	Cheek, Graham	1862 (K02, Tue)
Callahan, Will	1540 (I02, Wed)	Celasun, Yagmur	357 (A02, Thu)	Chen, Aicheng	1999 (M01, Mon)
Callaway, Jumia	199 (A02, Mon)	Ceneno, Alba	834 (B06, Tue)	Chen, Bingxin	33 (A01, Mon)
Calle-Vallejo, Federico	1668 (I03, Thu)	Cerdeira, Antonio	1239 (G03, Tue)	Chen, Chien-Lin	1371 (H03, Wed)
Calnan, Sonya	1636 (I03, Tue)	Cerón, Maira	786 (B05, Mon), 832 (B06, Tue), 1066 (F01, Wed)	Chen, Chih-Chen	1301 (H02, Mon)
Calvet, Laurie	1249 (G03, Wed)	Cerro-Lopez, Monica	765 (B04, Thu), 766 (B04, Thu), 767 (B04, Thu)	Chen, Ching-Hung	2034 (M01, Wed)
Camacho-Forero, Luis	273 (A02, Tue)	Cespedes, German	1559 (I02, Wed)	Chen, Chun-Hu	1781 (I05, Thu)
Camaioni, Donald	1091 (F01, Thu), 1612 (I03, Mon), 1625 (I03, Tue)	Cha, Eunho	26 (A01, Mon)	Chen, Chun-Tse	1090 (F01, Thu)
Câmara, Stella	2252 (Z02, Mon)	Cha, Wonsuk	2262 (Z03, Mon)	Chen, Dawei	939 (B08, Thu)
Cambré, Sofie	716 (B03, Tue)	Chahal, Mandeep	937 (B08, Wed)	Chen, Dongchang	339 (A02, Wed)
Cambre, Sofie	699 (B03, Mon)	Chahal, Mandeep	901 (B08, Tue)	Chen, Gan	929 (B08, Wed)
Campbell, Dean	1033 (D01, Tue)	Chai, Geun Seok	1440 (I01, Wed)	Chen, Gaofeng	1674 (I04, Tue)
Campbell, Elizabeth	663 (B02, Tue), 663 (B01-09, Tue), 665 (B02, Wed)	Chaitree, Wasu	1529 (I02, Wed)	Chen, Guan-Ying	1342 (H02, Wed)
Campbell, Patrick	832 (B06, Tue), 1066 (F01, Wed)	Chakir, Mohamed	284 (A02, Tue)	Chen, Gugang	396 (A02, Thu)
Campidelli, Stephane	719 (B03, Tue)	Chakraborty, Bitan	89 (A01, Wed), 1848 (K01, Mon)	Chen, Guohua	1516 (I02, Tue)
Campo, Jochen	699 (B03, Mon)	Chakrapani, Vidhya	1205 (G02, Sun)	Chen, Guoying	71 (A01, Wed), 339 (A02, Wed)
Campo, Nicholas	190 (A02, Mon)	Chalamala, Babu	454 (A03, Wed), 569 (A06, Mon), 605 (A06, Wed)	Chen, Hsueh-Yu	8 (A01, Sun)
Canfield, Brian	1480 (I02, Sun)	Chamanzar, Maysam	666 (B02, Wed)	Chen, Hsun-Yi	115 (A02, Sun), 2248 (Z02, Mon)
Canfield, Nathan	456 (A03, Wed)	Chan, Candace	464 (A04, Wed)	Chen, Jie	1285 (H01, Tue)
Cannon, Andrew	479 (A04, Wed)	Chan, Ho-Wei	2248 (Z02, Mon)	Chen, Jingyi	1451 (I01, Wed), 1522 (I02, Tue)
Cantillo, Nelly	432 (A03, Tue), 1141 (F04, Wed)	Chan, Ka	676 (B02, Thu)	Chen, Jingyi	1426 (I01, Tue)
Cantwell, Michael	676 (B02, Thu)	Chan, Kwong-Yu	428 (A03, Tue)	Chen, Junhong	1300 (H02, Mon)
Cao, Guozhong	384 (A02, Thu)	Chan, Maria	1498 (I02, Mon)	Chen, Ke	471 (A04, Wed), 2146 (Z01, Tue)
Cao, Huijun	2126 (Z01, Tue)	Chan, Shuen-Wen	1348 (H02, Wed)	Chen, Li	1864 (K02, Tue)
Cao, Lei	305 (A02, Wed)	Chan, Yat Tung	1691 (I04, Tue)	Chen, Liang-Yih	1609 (I03, Mon)
Cao, Pengfei	291 (A02, Tue), 452 (A03, Wed)	Chan, Yuting	2084 (M03, Wed)	Chen, Long-Qing	1131 (F04, Tue)
Cao, Rui	930 (B08, Wed)	Chan-Park, Mary	969 (B09, Wed)	Chen, Miao	1078 (F01, Wed)
Cao, Wendy	683 (B02, Thu)	Chanda, Uttam	1482 (I02, Sun)	Chen, Mingguang	964 (B09, Wed)
Cao, Xia	167 (A02, Mon)	Chandra, Ashwini	1025 (C01, Wed)	Chen, Muqing	797 (B05, Tue), 797 (B01-09, Tue)
Cao, Ye	1693 (I05, Sun)	Chandrasekaran, Swetha	436 (A03, Tue)	Chen, Ning	788 (B05, Tue), 789 (B05, Tue), 790 (B05, Tue)
Cao, Yu	1277 (H01, Tue)	Chang, An-Yi	2078 (M03, Tue)	Chen, Ning	444 (A03, Wed)
Caperton, Joshua	1015 (C01, Tue), 2166 (Z01, Tue)	Chang, Chieh-Feng	1371 (H03, Wed)	Chen, Po-Hsuan	1301 (H02, Mon), 1309 (H02, Mon), 1317 (H02, Mon)
Capuano, Christopher	1390 (I01, Mon), 1461 (I01, Thu)	Chang, Chin-Kai	981 (C01, Mon)	Chen, Qian	138 (A02, Sun)
Carey, Patrick	1261 (H01, Mon), 1264 (H01, Mon), 2082 (M03, Tue)	Chang, Chin-Wei	1264 (H01, Mon), 2082 (M03, Tue)	Chen, Shuo	1417 (I01, Tue)
Carim, Azhar	1209 (G02, Tue), 1212 (G02, Tue), 1223 (G02, Wed)	Chang, Gi Hwan	202 (A02, Mon), 213 (A02, Mon)	Chen, Shuo-Wen	1341 (H02, Wed)
Carkhuff, Bliss	584 (A06, Tue)	Chang, Hee Jung	456 (A03, Wed)	Chen, Shuru	112 (A02, Sun)
Carlier, Dany	14 (A01, Mon), 468 (A04, Wed), 544 (A05, Mon)	Chang, Jiang	411 (A03, Mon)	Chen, Tao	505 (A04, Thu)
Carlson, Krista	2118 (M03, Thu)	Chang, Jingbo	1300 (H02, Mon)	Chen, Tzu-Ling	157 (A02, Mon)
Carmo, Marcelo	1427 (I01, Wed), 1541 (I02, Wed)	Chang, Le	1617 (I03, Tue), 1644 (I03, Wed)	Chen, Xi	164 (A02, Mon)
Carpenter, Kelly	1687 (I04, Tue)	Chang, Seohyung	1660 (I03, Thu)	Chen, Xiaohong	1904 (L01, Tue)
Carrasco, Javier	553 (A05, Tue)	Chang, Tzu-Hsuan	2120 (M03, Thu)	Chen, Xinyi	897 (B07, Tue), 1070 (F01, Wed)
Carregosa, Ingrid	2043 (M01, Wed)	Chang, Wei-Shun	1912 (L01, Wed)	Chen, Xiujuan	427 (A03, Tue)
Carrion, Alexandra	2155 (Z01, Tue)	Chang, Yao-Feng	1168 (G01, Mon)	Chen, Xubin	148 (A02, Mon), 285 (A02, Tue)

Author Index

Author.....	Abs No.	Author.....	Abs No.	Author.....	Abs No.
Chen, Yingying.....	1569 (I02, Thu), 1651 (I03, Thu)	Choi, Ho-Suk	1393 (I01, Mon), 1397 (I01, Mon), 1446 (I01, Wed), 1449 (I01, Wed), 1450 (I01, Wed), 1471 (I01, Thu)	Chyan, Yieu.....	747 (B03, Wed)
Chen, Yongsheng.....	88 (A01, Wed), 973 (B09, Thu)	Choi, Hong Je.....	803 (B06, Sun), 812 (B06, Sun), 1358 (H03, Tue)	Ci, Lijie.....	299 (A02, Wed)
Chen, Yu-Cheng.....	1346 (H02, Wed)	Choi, Hyejeong.....	1879 (K03, Wed), 2217 (Z01, Tue)	Cicoira, Fabio.....	1250 (G03, Wed), 1369 (H03, Wed), 1878 (K03, Wed)
Chen, Yu-Hsuan.....	1199 (G01, Wed)	Choi, Hyung Jong.....	1645 (I03, Wed), 1755 (I05, Wed), 1760 (I05, Wed), 1762 (I05, Wed)	Ciepielewski, Daniel.....	728 (B01-09, Tue), 728 (B03, Tue)
Chen, Yuan.....	2006 (M01, Tue)	Choi, Jaecheol.....	228 (A02, Mon)	Ciszewski, Dorian.....	68 (A01, Tue)
Chen, Yun.....	1718 (I05, Tue), 1727 (I05, Tue)	Choi, Jin-Yi.....	192 (A02, Mon)	Clare, Laurie.....	2220 (Z01, Tue)
Chen, Zhen.....	129 (A02, Sun)	Choi, Jin-Young.....	1170 (G01, Mon)	Clare, Laurie.....	1861 (K02, Tue)
Chen, Zheng.....	1772 (I05, Thu)	Choi, Jongwan.....	1259 (G03, Wed)	Clark, David.....	1892 (L01, Mon)
Chen, Zhi.....	857 (B07, Sun)	Choi, Junil.....	1751 (I05, Wed)	Clark, Dexter.....	1862 (K02, Tue)
Chen, Zhongwei.....	641 (B01, Thu), 959 (B09, Wed)	Choi, Kisik.....	1048 (E01, Wed)	Clark, Robert.....	1167 (G01, Mon)
Chen, Ziguang.....	999 (C01, Tue)	Choi, Kyoung-Shin.....	57 (A01, Tue), 1602 (I03, Sun)	Claude, Théo.....	743 (B03, Wed)
Chen, Zong-Yi.....	2035 (M01, Wed)	Choi, PyoungHo.....	111 (A02, Sun)	Claudiel, Fabien.....	1972 (L04, Mon)
Chen, Zonghai.....	179 (A02, Mon), 306 (A02, Wed)	Choi, Pyung.....	1862 (K02, Tue)	Clement, Jason.....	437 (A03, Tue)
Chen-Wiegart, Yu-chen.....	1003 (C01, Tue)	Choi, Sang-Il.....	1689 (I04, Tue)	Clevenger, Larry.....	1048 (E01, Wed)
Chen-Wiegart, Yu-chen Karen.....	536 (A05, Mon), 1698 (I05, Sun)	Choi, Sukwon.....	1272 (H01, Mon)	Clever, Caleb.....	1298 (H02, Mon)
Cheng, Chao-Min.....	1308 (H02, Wed)	Choi, Sung RYul.....	1454 (I01, Wed)	Climent, Esteban.....	805 (B06, Sun)
Cheng, Gang.....	160 (A02, Mon)	Choi, Sung RYul.....	2133 (Z01, Tue)	Cline, Joseph.....	1711 (I05, Mon)
Cheng, I-Kai.....	2025 (M01, Wed)	Choi, Won Yeong.....	26 (A01, Mon), 169 (A02, Mon), 849 (B06, Tue), 849 (B01-09, Tue), 1121 (F03, Tue)	Co, Anne.....	1710 (I05, Mon)
Cheng, Ju-hsiang.....	1772 (I05, Thu)	Choi, Wobong.....	731 (B03, Tue), 731 (B01-09, Tue), 1519 (I02, Tue)	Cobley, Andrew.....	1073 (F01, Wed)
Cheng, Mark Ming-Cheng.....	1337 (H02, Wed)	Choi, Ye.....	1519 (I02, Tue)	Coburn, Scott.....	1696 (I05, Sun)
Cheng, Wen-I.....	1286 (H01, Tue)	Choi, Yun Young.....	2040 (M01, Wed)	Coca Clemente, Jose Antonio.....	481 (A04, Wed)
Cheng, Wenlong.....	1363 (H03, Tue)	Chong, Lina.....	1443 (I01, Wed), 1498 (I02, Mon)	Cocco, Alex.....	1695 (I05, Sun)
Cheng, Xuan.....	547 (A05, Mon), 1548 (I02, Wed)	Chorkendorff, Ib.....	1404 (I01, Mon), 1527 (I02, Tue), 1589 (I03, Sun)	Cofell, Emiliana.....	1070 (F01, Wed)
Cheong, Fook.....	1034 (D01, Tue)	Chou, Shih-Cheng.....	1076 (F01, Wed), 1113 (F03, Tue)	Coffel, Jeffery.....	1115 (F03, Tue), 1350 (H02, Wed)
Cherevko, Serhiy.....	1410 (I01, Tue), 1442 (I01, Wed), 1488 (I02, Sun), 1554 (I02, Wed)	Chou, Shih-Cheng.....	1076 (F01, Wed), 1113 (F03, Tue)	Cogan, Stuart.....	89 (A01, Wed), 1208 (G02, Tue), 1847 (K01, Mon), 1848 (K01, Mon), 2160 (Z01, Tue)
Cherusseri, Jayesh.....	645 (B01, Thu), 1985 (L04, Tue)	Chou, Wen-Fang.....	1246 (G03, Wed)	Cognard, Gwenn.....	1972 (L04, Mon)
Chervin, Christopher.....	1769 (I05, Thu)	Chou, Yi-Sin.....	27 (A01, Mon)	Cognet, Laurent.....	674 (B02, Thu)
Cheung, Ghunbong.....	2056 (M02, Wed)	Chouchane, Mehdi.....	378 (A02, Thu)	Cohen, Joseph.....	747 (B03, Wed)
Cheyne, Cameron.....	1908 (L01, Tue)	Choudhury, Amitava.....	467 (A04, Wed)	Cohen, Seth.....	2224 (Z01, Tue)
Chi, Bo.....	33 (A01, Mon), 220 (A02, Mon)	Choudhury, Devika.....	334 (A02, Wed)	Cohen, Sidney.....	2004 (M01, Tue)
Chi, Xiaowei.....	473 (A04, Wed)	Choudhury, Fatema.....	638 (B01, Wed)	Cohen-Karni, Tzahi.....	666 (B02, Wed)
Chiang, Cheng-Hsuan.....	1537 (I02, Wed)	Choudhury, Tanushree.....	836 (B06, Tue)	Colclasure, Andrew.....	324 (A02, Wed), 368 (A02, Thu), 1136 (F04, Wed)
Chiang, Chien-Chih.....	3 (A01, Sun)	Chourou, Slim.....	1232 (G03, Tue)	Coleman, Eric.....	1491 (I02, Sun)
Chiang, Kuang-Hsing.....	1340 (H02, Wed)	Christensen, Steve.....	1932 (L02, Thu)	Coleman, Jonathan.....	2008 (M01, Tue)
Chiang, Wei-Hung.....	2115 (M03, Thu)	Chu, Chih-Wei.....	282 (A02, Tue)	Colin, Jean François.....	357 (A02, Thu)
Chiang, Yet-Ming.....	500 (A04, Thu)	Chu, Deryn.....	1708 (I05, Mon), 1712 (I05, Tue)	Colinge, Jean-Pierre.....	1198 (G01, Wed)
Chien, Cheng-Yen.....	1286 (H01, Tue)	Chu, Kevin.....	1712 (I05, Tue)	Collins, John.....	58 (A01, Tue), 1165 (G01, Mon)
Chien, Yen.....	1283 (H01, Tue)	Chua, Lee.....	1125 (F04, Tue)	Collins, Sean.....	873 (B07, Mon), 1912 (L01, Tue), 1926 (L01, Wed)
Chigan, Ting.....	444 (A03, Wed)	Chuah, Xui-Fang.....	1418 (I01, Tue)	Colombo, Luigi.....	1190 (G01, Wed)
Chintam, Kavitha.....	1805 (I06, Tue)	Chuang, Abel.....	1412 (I01, Tue)	Compton, Richard.....	1894 (L01, Mon)
Chiochan, Poramane.....	162 (A02, Mon), 275 (A02, Tue), 494 (A04, Thu)	Chuang, Po-Ya Abel.....	1562 (I02, Wed), 2188 (Z01, Tue), 2189 (Z01, Tue), 2190 (Z01, Tue), 2191 (Z01, Tue), 2192 (Z01, Tue), 2193 (Z01, Tue)	Coms, Frank.....	1481 (I02, Sun)
Chitturi, Venkateswara.....	1955 (L03, Tue)	Chuang, Ricky.....	2009 (M01, Tue)	Condorelli, Guglielmo.....	1435 (I01, Wed)
Chiu, Che-Min.....	1315 (H02, Mon)	Chubarov, Mikhail.....	836 (B06, Tue)	Cong, Lei.....	901 (B08, Tue)
Chiu, Kuan-Hua.....	12 (A01, Sun)	Chudova, Nadezhda.....	236 (A02, Mon)	Conlin, Patrick.....	483 (A04, Wed)
Chiu, Tse-Ming.....	987 (C01, Mon)	Chung, Chi Yuen.....	550 (A05, Mon)	Connell, John.....	649 (B01, Thu)
Chiu, Wilson.....	1736 (I05, Wed)	Chung, Choong-Heui.....	861 (B07, Sun)	Consiglio, Steven.....	1167 (G01, Mon)
Cho, Byeong-Gwan.....	1660 (I03, Thu)	Chung, Dong Jae.....	205 (A02, Mon), 255 (A02, Tue)	Cook, Christine.....	1699 (I05, Mon)
Cho, Changhyeon.....	1311 (H02, Mon)	Chung, Dong Young.....	1414 (I01, Tue), 1971 (L04, Mon)	Cook, Clifford.....	1712 (I05, Tue)
Cho, EunAe.....	1433 (I01, Wed), 1456 (I01, Wed), 1738 (I05, Wed)	Chung, Dong Young.....	1555 (I02, Wed)	Cook, Ryan.....	613 (B01, Tue), 613 (B01-09, Tue)
Cho, Gyu-bong.....	462 (A04, Wed)	Chung, Hoon.....	1406 (I01, Tue), 1489 (I02, Sun), 1499 (I02, Mon), 1500 (I02, Mon)	Cookson, James.....	518 (A05, Sun)
Cho, Jaesung.....	37 (A01, Mon)	Chung, Wei-An.....	1076 (F01, Wed), 1113 (F03, Tue)	Coperet, Christophe.....	1405 (I01, Mon)
Cho, Jason.....	1473 (I02, Sun), 1474 (I02, Sun)	Chung, Wen-Yaw.....	1371 (H03, Wed)	Coppard, Romain.....	1253 (G03, Wed)
Cho, Kang Hee.....	1444 (I01, Wed), 1469 (I01, Thu)	Chung, Yung Sik.....	1751 (I05, Wed)	Coppens, Marc.....	1474 (I02, Sun)
Cho, Kyeongjae.....	483 (A04, Wed), 2127 (Z01, Tue), 2128 (Z01, Tue)	Chung, Yoon Sun.....	1316 (H02, Mon)	Corà, Furio.....	387 (A02, Thu)
Cho, Kyu Taek.....	1 (A01, Sun), 2 (A01, Sun), 9 (A01, Sun)	Chura, William.....	2233 (Z01, Tue)	Coridan, Robert.....	989 (C01, Mon), 1584 (I03, Sun), 1703 (I05, Mon), 1704 (I05, Mon)
Cho, M.....	1766 (I05, Thu)	Chyan, Oliver.....	978 (C01, Mon), 2166 (Z01, Tue)	Corminboeuf, Clemence.....	662 (B01-09, Tue), 662 (B02, Tue)
Cho, Maenghyo.....	2127 (Z01, Tue), 2128 (Z01, Tue)	Chyan, Oliver.....	977 (C01, Mon)	Cornejo, Mario.....	1046 (D01, Wed)
Cho, Soo-Haeng.....	2158 (Z01, Tue)	Chyan, Oliver.....	1015 (C01, Tue)	Cornell, Ann.....	1094 (F01, Thu)
Cho, Woosuk.....	2130 (Z01, Tue)			Corona Castro, Jair.....	753 (B04, Tue), 753 (B01-09, Tue)
Cho, Yong Soo.....	803 (B06, Sun), 812 (B06, Sun), 1358 (H03, Tue), 2007 (M01, Tue)			Corona-Avenidaño, Silvia.....	750 (B01-09, Tue), 750 (B04, Tue), 751 (B04, Tue), 751 (B01-09, Tue)
Cho, Yong-Hun.....	1503 (I02, Mon)			Corr, Stuart.....	688 (B02, Thu)
Chockalingam, Ashwin.....	1046 (D01, Wed)			Corsi, John.....	1112 (F03, Tue)
Choe, Yoong-Kee.....	1574 (I02, Thu)			Cortes-Ordóñez, Harold.....	1239 (G03, Tue)
Choe, Yun Jeong.....	1987 (L04, Tue)			Cosnier, Serge.....	1904 (L01, Tue)
Choi, Han Ul.....	202 (A02, Mon)			Coughlin, Bryan.....	1511 (I02, Tue)
Choi, Hanbin.....	1311 (H02, Mon)				

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Coulthard, Riley	67 (A01, Tue), 95 (A01, Thu)	Darbandy, Ghader	1238 (G03, Tue)	Dhanapala Mudiyansele, Lasangi	1884 (K03, Wed), 2114 (M03, Thu)
Counihan, Michael	1893 (L01, Mon), 1913 (L01, Tue)	DaRos, Tatiana	669 (B02, Wed)	Dharmaratne, Asantha	2095 (M03, Wed)
Coutanceau, Christophe	1439 (I01, Wed)	Darr, Jawwad	386 (A02, Thu)	Di Natale, Corrado	898 (B08, Tue)
Couto Petro, Ana	1858 (K02, Tue)	Das, Debanjan	1382 (I01, Sun), 1780 (I05, Thu)	Di Noto, Vito	1739 (I05, Wed), 1801 (I06, Tue), 1989 (L04, Wed)
Coya, Carmen	805 (B06, Sun)	Das, Himadri	2129 (Z01, Tue)	Diau, Eric	868 (B07, Mon)
Crawford, Alasdair J.	372 (A02, Thu)	Das, Saptarshi	824 (B06, Mon)	Diaz, Susana	1930 (L02, Tue)
Creager, Stephen	460 (A04, Wed), 813 (B06, Mon), 1573 (I02, Thu)	Dasgupta, Archi	756 (B04, Thu)	Diaz Llorente, Carlos	1198 (G01, Wed)
Cresce, Arthur	69 (A01, Wed)	Datta, Dibakar	144 (A02, Sun), 806 (B06, Sun)	Dickerson, Charles	531 (A05, Mon), 595 (A06, Wed)
Cristoloveanu, Sorin	1198 (G01, Wed)	Datta, Moni	48 (A01, Tue), 1434 (I01, Wed)	Didwal, Pravin N.	233 (A02, Mon)
Croguennec, Laurence	468 (A04, Wed), 544 (A05, Mon)	Daudt, Natalia	1549 (I02, Wed)	Diederichs, Carole	719 (B03, Tue)
Cronin, Stephen	723 (B03, Tue), 1604 (I03, Mon), 1702 (I05, Mon)	Daugherty, Michael	440 (A03, Wed)	Diehm, Ralf	181 (A02, Mon)
Crooks, Richard	2167 (Z01, Tue), 2232 (Z01, Tue)	Dauidi, Guy	300 (A02, Wed)	Dietz Rago, Nancy	599 (A06, Wed)
Croy, Jason	262 (A02, Tue), 334 (A02, Wed)	Davies, Collin	2167 (Z01, Tue)	Dillet, Jérôme	1377 (H03, Wed)
Crumlin, Ethan	523 (A05, Sun), 1593 (I03, Sun)	Davis, Benjamin	448 (A03, Wed)	Dimaki, Maria	2021 (M01, Wed)
Csoros, John	2108 (M03, Wed)	Davis, Connor	1867 (K02, Tue)	Dimakis, Nicholas	1963 (L03, Tue)
Cuesta, Virginia	922 (B08, Wed)	Davis, Lloyd	1480 (I02, Sun)	Dimandja, Jean-Marie	2120 (M03, Thu)
Cui, Tongming	996 (C01, Tue), 997 (C01, Tue), 1022 (C01, Wed), 1027 (C01, Wed), 1028 (C01, Wed)	Davis, Ryan	1749 (I05, Wed)	Ding, Dong	653 (B01, Thu)
Cui, Yi	1466 (I01, Thu)	Davoodabadi, Ali	516 (A05, Sun)	Ding, Liangxin	1674 (I04, Tue)
Cui, Yubo	1275 (H01, Tue)	Davydova, Elena	1521 (I02, Tue)	Ding, Wenjiang	1498 (I02, Mon)
Cui, Zhiming	1415 (I01, Tue)	de Almeida, Juliana	2252 (Z02, Mon)	Dinh, Cao-Thang	1580 (I03, Sun), 1585 (I03, Sun)
Culbertson, James	1270 (H01, Mon)	de Andrés, Alicia	805 (B06, Sun)	Dinh, Huyen	1389 (I01, Mon)
Cullen, David	1437 (I01, Wed), 1475 (I01, Sun), 1486 (I02, Sun), 1499 (I02, Mon), 1500 (I02, Mon)	De Angelis, Salvatore	1701 (I05, Mon)	Dion, Matt	40 (A01, Mon)
Culp, Jeffrey	2015 (M01, Tue), 2024 (M01, Wed), 2028 (M01, Wed)	De Castro, Olivier	918 (B08, Wed)	Ditter, Alex	534 (A05, Mon)
Cummings, Peter	501 (A04, Thu)	De Feyter, Steven	835 (B06, Tue)	Dive, Aniruddha	101 (A01, Thu), 1139 (F04, Wed)
Cuneo, Matt	20 (A01, Mon)	De Gendt, Stefan	1207 (G02, Tue), 2221 (Z01, Tue)	Djenizian, Thierry	154 (A02, Mon), 303 (A02, Wed), 337 (A02, Wed)
Cunha, Jose	75 (B04, Thu)	de la Cruz, Pilar	778 (B05, Mon), 922 (B08, Wed)	Do, Huong Tra	548 (A05, Mon)
Cupo, Christian	721 (B03, Tue)	De March, Claire	1880 (K03, Wed)	Doan, Huong	1818 (I06, Wed)
Curran, Christopher	1725 (I05, Tue)	De Porcellinis, Diana	407 (A03, Mon)	Dobele, Galina	1531 (I02, Tue)
Curran, Luke	584 (A06, Tue)	De Souza, Joel	58 (A01, Tue)	Dobley, Arthur	1699 (I05, Mon)
Curtin, Kathrine	2091 (M03, Wed)	de Vasconcelos, Luize	478 (A04, Wed)	Dodabalapur, Ananth	1254 (G03, Wed), 1257 (G03, Wed), 1258 (G03, Wed)
Curvers, Benoit	1183 (G01, Tue)	DeAngelis, Alexander	1627 (I03, Tue)	Dodson, G.	1265 (H01, Mon)
Cushing, Scott	1631 (I03, Tue)	DeAnni, Anthony	1712 (I05, Tue)	Doeff, Marca	71 (A01, Wed)
Custelcean, Radu	1568 (I02, Wed)	Debrassi, Aline	2112 (M03, Wed)	Doğan, Ömer	1000 (C01, Tue)
Cvetic, Patricia	2024 (M01, Wed)	Debucquoy, Maarten	148 (A02, Mon), 285 (A02, Tue)	Dokko, Kaoru	259 (A02, Tue)
		DeCaluwe, Steven	1740 (I05, Wed)	Dolati, Abolghasem	2012 (M01, Tue)
		Dechent, Philipp	517 (A05, Sun)	Dollé, Mickael	68 (A01, Tue), 489 (A04, Wed)
		Decurtins, Silvio	920 (B08, Wed)	Dolocan, Andrei	263 (A02, Tue)
		Deen, M.	1243 (G03, Tue)	Domen, Kazunari	1603 (I03, Sun)
		Deford, Kevin	979 (C01, Mon), 980 (C01, Mon)	Dominko, Robert	53 (A01, Tue), 62 (A01, Tue)
		Deganello, Francesca	1984 (L04, Tue)	Donakowski, Martin	383 (A02, Thu)
		Deibert, Wendelin	1728 (I05, Tue)	Dong, Bo	592 (A06, Tue)
		Dekel, Dario	1521 (I02, Tue), 1957 (L03, Tue)	Dong, Chang-Zhi	1979 (L04, Tue)
		Delices, Annette	1979 (L04, Tue)	Dong, Hongxu	180 (A02, Mon), 485 (A04, Wed)
		Delmas, Claude	14 (A01, Mon)	Dong, Hui	1771 (I05, Thu)
		Delnick, Frank	314 (A02, Wed), 450 (A03, Wed), 451 (A03, Wed), 452 (A03, Wed)	Dong, Kang	539 (A05, Mon)
		DeLongchamp, Dean	1235 (G03, Tue)	Dong, Peng	596 (A06, Wed)
		Delp, Samuel	1766 (I05, Thu)	Dong, Quanfeng	271 (A02, Tue), 1459 (I01, Wed)
		Dembec, Jacob	177 (A02, Mon)	Dong, Yong-Rong	401 (A03, Mon)
		Demirev, Plamen	584 (A06, Tue)	Dong, Ziyue	341 (A02, Wed)
		Deng, Dingrong	271 (A02, Tue)	Dongare, Avinash	1699 (I05, Mon)
		Deng, Huiqiu	1546 (I02, Wed)	Dongjun, Wu	1896 (L01, Mon)
		Deng, Shiqing	1522 (I02, Tue)	Donzel, Nicolas	1986 (L04, Tue)
		Deng, Zhi	1772 (I05, Thu)	Doorn, Stephen	745 (B03, Wed)
		Denzumi, Shigenobu	143 (A02, Sun)	Dooryhee, Eric	536 (A05, Mon)
		Deo, Makarand	1218 (G02, Tue), 2177 (Z01, Tue), 2178 (Z01, Tue), 2183 (Z01, Tue)	Dopilka, Andrew	464 (A04, Wed)
		Deria, Pravas	927 (B08, Wed)	Dorn, Harry	783 (B05, Mon), 791 (B05, Tue)
		DeSario, Paul	1769 (I05, Thu)	Dornbusch, Donald	347 (A02, Thu)
		Deschamps, Michael	537 (A05, Mon)	Doroshenko, Vladimir	2120 (M03, Thu)
		Deschamps, Michaël	537 (A05, Mon)	dos Santos, Pamyly	1407 (I01, Tue)
		Deslouis, Claude	2125 (M03, Thu)	Döschet, Henning	1633 (I03, Tue)
		Detsi, Eric	140 (A02, Sun), 349 (A02, Thu), 1112 (F03, Tue)	Doucet, Mathieu	526 (A05, Sun)
		Deutsch, Todd	1569 (I02, Thu), 1632 (I03, Tue), 1633 (I03, Tue), 1641 (I03, Wed), 1651 (I03, Thu)	Doughty, Philip	2001 (M01, Mon)
		Devi, Pooja	2032 (M01, Wed)	Doughty, Phillip	2098 (M03, Wed), 2107 (M03, Wed)
		Devkota, Jagannath	2015 (M01, Tue)	Doughty, Rachel	2056 (M02, Wed)
		Dey, Suhash	2036 (M01, Wed)	Douillard, Thierry	537 (A05, Mon)
		Dhamu, Vikram Narayanan	2051 (M01, Wed)	Dousti, Behnoush	731 (B03, Tue), 731 (B01-09, Tue), 1519 (I02, Tue)
		Dhanak, Vinod	481 (A04, Wed)	Doux, Jean-Marie	1772 (I05, Thu)

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Dovbeshko, Galina	42 (A01, Mon), 802 (B06, Sun)	Eidson, Nicolas	69 (A01, Wed)	Fan, Huafang	2087 (M03, Wed)
Drabavičius, Audrius	612 (B01-09, Tue), 612 (B01, Tue)	Eifert, László	1117 (F03, Tue)	Fan, Jingmin	271 (A02, Tue)
Dreer, Christian	181 (A02, Mon)	Ein-Eli, Yair	303 (A02, Wed)	Fan, Jingwei	2144 (Z01, Tue)
Dreiser, Jan	920 (B08, Wed)	Ejigu, Andinet	871 (B06, Tue)	Fan, Louzhen	628 (B01, Wed)
Drevon, Tark	1232 (G03, Tue)	El Helou, Assaad	1235 (H01, Tue)	Fan, Mengyang	1978 (L04, Tue)
Drewry, Benjamin	1768 (I05, Thu)	El Khakani, Soumia	68 (A01, Tue), 608 (B01, Tue), 608 (B01-09, Tue)	Fan, Yubo	82 (A01, Wed), 1333 (H02, Tue)
Drews, Andy	521 (A05, Sun)	El Mejdoubi, Asmae	1089 (F01, Wed)	Fan, Yueying	1718 (I05, Tue)
Driscoll, David	1723 (I05, Tue)	El-Kaderi, Hani	638 (B01, Wed)	Fang, Hui	198 (A02, Mon)
Dropiewski, Katherine	1352 (H02, Wed)	El-Sayed, Hany	1793 (I06, Mon)	Fang, Jason	282 (A02, Tue)
Droz, Vadym	304 (A02, Wed)	Elabd, Yossef	157 (A02, Mon), 1514 (I02, Tue)	Fang, Jie	550 (A05, Mon)
Dryfe, Robert	831 (B06, Tue), 833 (B06, Tue)	Eladgham, Ebtesam	1630 (I03, Tue)	Fang, Zhao	110 (A02, Sun)
Du, Huiling	129 (A02, Sun)	Elam, Jeffrey	155 (A02, Mon), 332 (A02, Wed), 334 (A02, Wed), 1460 (I01, Thu)	Fanjul, Pablo	1914 (L01, Tue), 1917 (L01, Wed)
Du, Li	1415 (I01, Tue)	Elangovan, Ayyappan	635 (B01, Wed)	Fardadi, Mahshid	2187 (Z01, Tue)
Du, Pingwu	795 (B05, Tue)	Elbaz, Lior	1523 (I02, Tue)	Fares, Chaker	1268 (H01, Mon)
Du, Rui	900 (B08, Tue)	Elgammal, Ramez	297 (A02, Wed)	Farghaly, Ahmed	1460 (I01, Thu), 1564 (I02, Wed), 1565 (I02, Wed)
Du, Xiaoniu	573 (A06, Mon)	Elharati, Mohamed	1844 (K01, Mon)	Farghaly, Ahmed	1902 (I02, Mon)
Du, Yanhai	1716 (I05, Tue)	Elizalde-Segovia, Rodrigo	270 (A02, Tue)	Farhat, Mahmoud	1009 (C01, Tue)
Du, Yifeng	1511 (I02, Tue)	Elizondo, Antonio	185 (A02, Mon), 186 (A02, Mon), 294 (A02, Tue)	Farias, Ravir	2045 (M01, Wed)
Du, Zhijia	73 (A01, Wed), 267 (A02, Tue), 358 (A02, Thu), 392 (A02, Thu), 599 (A06, Wed)	Eller, Jens	1810 (I06, Tue)	Farzana, Esmat	1263 (H01, Mon)
Duan, Qiaohui	290 (A02, Tue)	Ellinwood, Clayton	198 (A02, Mon)	Farzaneh, Mahsa	1902 (L01, Tue)
Duangdangchote, Salatan	162 (A02, Mon), 170 (A02, Mon), 274 (A02, Tue), 275 (A02, Tue), 493 (A04, Thu), 494 (A04, Thu), 532 (A05, Mon)	Ellison, Christopher	341 (A02, Wed)	Fauth, François	468 (A04, Wed)
Duangthaijomsuk, Surachet	2049 (M01, Wed)	Ellnabawy, Ahmed	1800 (I06, Tue)	Fear, Conner	598 (A06, Wed)
Duay, Jonathon	420 (A03, Tue)	Emerce, Nur Ber	281 (A02, Tue)	Fei, Honghan	2224 (Z01, Tue)
Dubarry, Matthieu	489 (A04, Wed)	Emge, Steffen	558 (A05, Tue)	Fei, Ling	190 (A02, Mon), 200 (A02, Mon), 613 (B01, Tue), 613 (B01-09, Tue), 1419 (I01, Tue)
Dubau, Lactitia	1544 (I02, Wed), 1972 (L04, Mon)	Emley, Benjamin	2205 (Z01, Tue)	Feinberg, Adam	666 (B02, Wed)
Dubiel, Adrian	1981 (L04, Tue)	Endisch, Christian	517 (A05, Sun), 549 (A05, Mon)	Feliu, Juan	1888 (L01, Mon)
Dudney, Nancy	147 (A02, Mon), 316 (A02, Wed), 528 (A05, Mon)	Endrodi, Balazs	1094 (F01, Thu)	Fellinger, Tim	146 (A02, Sun)
Dufek, Eric	531 (A05, Mon), 595 (A06, Wed), 1128 (F04, Tue), 1156 (F04, Thu)	Engelhard, Mark	257 (A02, Tue)	Felten, Nando	161 (A02, Mon)
Duffy, Timothy	2018 (M01, Tue)	England, Jennifer	1018 (C01, Tue)	Feng, Hongqing	1313 (H02, Mon)
Dumitrascu, Adina	412 (A03, Mon), 413 (A03, Mon)	Enriquez, Erwin	2046 (M01, Wed)	Feng, Lai	788 (B05, Tue)
Dunk, Paul	786 (B05, Mon), 792 (B05, Tue)	Enterria, Marina	553 (A05, Tue)	Feng, Ruozhu	417 (A03, Tue)
Dunklin, Jeremy	818 (B06, Mon)	Entwistle, Jake	295 (A02, Wed)	Feng, Xiaofeng	1673 (I04, Tue)
Dunlop, Alison	254 (A02, Tue), 368 (A02, Thu)	Eoh, Hongkyu	2176 (Z01, Tue), 2235 (Z01, Tue)	Feng, Xuefei	351 (A02, Thu)
Dunne, Alana	2194 (Z01, Tue)	Eom, Chuhyon	1508 (I02, Mon)	Feng, Xuning	568 (A06, Mon), 579 (A06, Tue), 581 (A06, Tue), 582 (A06, Tue), 585 (A06, Tue), 588 (A06, Tue), 590 (A06, Tue), 593 (A06, Tue)
Duoss, Eric	436 (A03, Tue), 1965 (L03, Tue)	Epshteyn, Albert	1991 (L04, Wed)	Feng, Zhenxing	362 (A02, Thu), 1403 (I01, Mon)
Dupont, Marc	1986 (L04, Tue)	Erb, Randall	1110 (F03, Tue)	Fenton, Kyle	551 (A05, Tue), 599 (A06, Wed)
Dupuis, Vincent	2125 (M03, Thu)	Erickson, Evan	315 (A02, Wed)	Ferguson, Andrew	623 (B01, Wed), 724 (B03, Tue), 727 (B03, Tue), 1248 (G03, Wed)
Dura, Joseph	527 (A05, Sun)	Erisen, Nisa	241 (A02, Mon)	Fermin, David	2062 (M02, Wed)
Durante, Christian	1492 (I02, Sun)	Eroglu, Damla	281 (A02, Tue)	Fernandez, Carlos	2213 (Z01, Tue)
Duriez, Christian	1021 (C01, Wed)	Eroglu, Damla	241 (A02, Mon)	Fernández Tavizón, Salvador	1566 (I02, Wed)
Dutta, Arghya	209 (A02, Mon), 352 (A02, Thu)	Ertugrul, Tugrul	437 (A03, Tue)	Fernández-Cori, Rey	1496 (I02, Sun)
Dutta, Gaurab	2001 (M01, Mon)	Espinoza-Lopez, Thomas	767 (B04, Thu)	Fernández-Pérez, Bibiana	998 (C01, Tue), 2268 (Z03, Mon)
Dutta, Gaurab	2078 (M03, Tue)	Essehli, Rachid	244 (A02, Mon)	Fernandez-Vera, Oscar	933 (B08, Wed)
Dutta, Gaurab	2108 (M03, Wed)	Estrada, David	817 (B06, Mon), 2086 (M03, Wed)	Ferrandon, Magali	1460 (I01, Thu), 1491 (I02, Sun)
Dvorak, Filip	837 (B06, Tue), 2060 (M02, Wed)	Estrada, Magali	1239 (G03, Tue)	Ferrari, Andrea	819 (B06, Mon)
Dweik, Badawi	1852 (K01, Mon)	Etcheberry, Arnaud	1206 (G02, Tue), 1213 (G02, Tue), 1220 (G02, Wed), 1224 (G02, Wed), 1230 (G02, Wed)	Ferraris, John	659 (B01, Thu), 1976 (L04, Tue), 1994 (L04, Wed), 1997 (L04, Wed), 2151 (Z01, Tue)
Dwyer, Jonathan	695 (B03, Mon)	Etxebarria, Ane	1593 (I03, Sun)	Ferré-Borrull, Josep	1234 (G03, Tue), 1338 (H02, Wed)
Dzakpasu, Cyril Bubu	210 (A02, Mon)	Etxebarria, Ane	523 (A05, Sun)	Ferreira, Summer	569 (A06, Mon), 605 (A06, Wed)
		Evans, K	1265 (H01, Mon)	Fevola, Giovanni	1701 (I05, Mon)
E		Evans, Michael	595 (A06, Wed)	Fezai, Fatma	2010 (M01, Tue)
E. Palo, Pierre	1895 (L01, Mon)	Evans, Russel	1993 (L04, Wed)	Fiala, Roman	1447 (I01, Wed)
Easley, Alexandra	1875 (K03, Wed), 1883 (K03, Wed), 2144 (Z01, Tue)	Evitts, Richard	1966 (L03, Tue)	Fichtner, Maximilian	346 (A02, Thu), 353 (A02, Thu)
Ebenso, Eno	1006 (C01, Tue), 1007 (C01, Tue)	Evrard, David	2010 (M01, Tue)	Fies, Whitney	2232 (Z01, Tue)
Echegoyen, Luis	786 (B05, Mon), 788 (B05, Tue), 790 (B05, Tue), 832 (B06, Tue)	Evseev, Anatoly	1850 (K01, Mon), 1851 (K01, Mon)	Figueroa-Gonzalez, Aura	765 (B04, Thu)
Edwards, Jonathan	1580 (I03, Sun), 1585 (I03, Sun)	Eypert, Celine	1220 (G02, Wed)	Filetás, Dániel	2268 (Z03, Mon)
Edwards, Martin	1908 (L01, Tue)			Fincher, Cole	533 (A05, Mon)
Edziah, Jed-Joan	433 (A03, Tue)	F		Finegan, Donal	576 (A06, Tue)
Eggleton, Erica	1155 (F04, Thu)	Fabbri, Emiliana	1405 (I01, Mon)	Fingerle, Mathias	1207 (G02, Tue), 2221 (Z01, Tue)
Egri, Gabriela	2112 (M03, Wed)	Faegh, Ehsan	2141 (Z01, Tue)	Fink, Kae	1120 (F03, Tue), 1133 (F04, Tue)
Ehlen, Niels	852 (B01-09, Tue), 852 (B06, Tue)	Fagan, Jeffrey	699 (B03, Mon), 705 (B03, Mon)	Fiروزان, Farinaz	1601 (I03, Sun)
		Fagerli, Frode	125 (A02, Sun), 816 (B06, Mon)		
		Fahrenkrug, Eli	2030 (M01, Wed)		
		Fahy, Kieran	1116 (F03, Tue), 1741 (I05, Wed)		
		Faid, Alaa	1396 (I01, Mon)		
		Fajardo, Santiago	998 (C01, Tue)		
		Fajardo-Díaz, Juan	758 (B04, Thu)		
		Fakih, Ibrahim	834 (B06, Tue)		
		Falke, Yannik	852 (B01-09, Tue), 852 (B06, Tue)		

Author Index

Author	Abs No.
Fischer, Stefanie	1541 (I02, Wed)
Fischer, Thomas	1616 (I03, Mon)
Fisher, Adrian	1151 (F04, Wed)
Fisher, Felix	845 (B06, Tue)
Fister, Timothy	386 (A02, Thu), 534 (A05, Mon)
Fitzhugh, William	63 (A01, Tue)
Fjellvåg, Helmer	70 (A01, Wed)
Flatebo, Charlotte	873 (B07, Mon), 1926 (L01, Wed)
Flavel, Benjamin	704 (B03, Mon), 705 (B03, Mon)
Fleming, Aaron	1908 (L01, Tue)
Fleutot, Benoît	151 (A02, Mon)
Flores, Marco	931 (B08, Wed)
Florian, Jacob	438 (A03, Wed)
Flouda, Paraskevi	499 (A04, Thu)
Foord, John	1894 (L01, Mon)
Ford, Hunter	498 (A04, Thu)
Fornaciari, Julie	1462 (I01, Thu)
Fornasiero, Francesco	67 (A01, Tue), 95 (A01, Thu), 708 (B03, Mon)
Former-Cuenca, Antoni	500 (A04, Thu), 1105 (F03, Tue)
Foroozan, Tara	603 (A06, Wed), 606 (A06, Wed)
Forouzan, Mehdi	394 (A02, Thu), 597 (A06, Wed)
Forseth, Sissel	566 (A06, Mon)
Fortner, Jacob	733 (B03, Tue), 733 (B01-09, Tue)
Fortner, Jacob	711 (B03, Tue)
Foster, Geoffrey	1274 (H01, Tue)
Foster, Kate	1003 (C01, Tue)
Frache, Gilles	918 (B08, Wed), 919 (B08, Wed)
Franco, Adam	13 (A01, Sun)
Franco, Alejandro	378 (A02, Thu)
Franco-Gallo, Franz	156 (A02, Mon)
Franklin, Hannah	783 (B05, Mon), 784 (B05, Mon), 798 (B01-09, Tue), 798 (B05, Tue), 799 (B01-09, Tue), 799 (B05, Tue)
Frederick, Rebecca	1208 (G02, Tue)
Freeland, John	386 (A02, Thu)
Frégnaux, Mathieu	1206 (G02, Tue), 1213 (G02, Tue), 1220 (G02, Wed), 1224 (G02, Wed), 1230 (G02, Wed)
Freiberg, Anna	559 (A05, Tue)
Fresquez, Armando	605 (A06, Wed)
Friedman, Daniel	1632 (I03, Tue)
Friedrich, Franziska	559 (A05, Tue)
Frischknecht, Amalie	1571 (I02, Thu), 1946 (L03, Mon)
Fritsch, Ingrid	2226 (Z01, Tue)
Fritz, Kevin	1583 (I03, Sun)
Frizzell-Makowski, Linda	584 (A06, Tue)
Fu, Chun-Chien	2050 (M01, Wed)
Fu, Jintao	1112 (F03, Tue)
Fu, Kang	1761 (I05, Wed)
Fu, Qiang	2134 (Z01, Tue)
Fu, Yanbao	182 (A02, Mon)
Fuchs, David	416 (A03, Mon)
Fuentes-Hernandez, Canek	1246 (G03, Wed)
Fuentevilla, Daphne	338 (A02, Wed)
Fugattini, Silvio	251 (A02, Tue)
Fujigaya, Tsuyohiko	697 (B03, Mon), 732 (B03, Tue), 732 (B01-09, Tue)
Fujimoto, Cy	1575 (I02, Thu)
Fujimoto, Kiyo	2086 (M03, Wed)
Fujimoto, Masahisa	447 (A03, Wed)
Fujimoto, Shinji	993 (C01, Tue)
Fujisawa, Kazunori	756 (B04, Thu), 831 (B06, Tue)
Fujita, Yuki	2149 (Z01, Tue)
Fujiwara, Ichiro	1181 (G01, Tue)
Fukuda, Kenjiro	2092 (M03, Wed)
Fukuda, Yoshitaka	2229 (Z01, Tue)
Fukui, Masahiro	391 (A02, Thu)

Author	Abs No.
Fukunaka, Yasuhiro	1124 (F04, Tue), 2173 (Z01, Tue)
Fuller, Thomas	1730 (I05, Wed), 1788 (I06, Mon)
Funakubo, Hiroshi	1181 (G01, Tue)
Fung, Jason	1046 (D01, Wed)
Furube, Akihiro	874 (B07, Mon), 1609 (I03, Mon)
Furukawa, Hidemitsu	2123 (M03, Thu)
Furukawa, Moeko	634 (B01, Wed)
Futagoishi, Tsukasa	189 (A02, Mon)

G

G. Theodorou, Christoforos	1198 (G01, Wed)
Gabardo, Christine	1580 (I03, Sun), 1585 (I03, Sun)
Gade, Lutz	920 (B08, Wed)
Gaiaschi, Sofia	1220 (G02, Wed)
Gaillard, Nicolas	1627 (I03, Tue)
Gaines, Linda	25 (A01, Mon)
Gaitis, Alexandre	1253 (G03, Wed)
Gajulapalle, Madhavi	2044 (M01, Wed)
Galan-Mascaros, Jose	1995 (L04, Wed)
Galassi, Thomas	691 (B02, Thu)
Galindo, Christophe	91 (A01, Wed)
Gallagher, James	1274 (H01, Tue)
Galloway, Joshua	504 (A04, Thu), 535 (A05, Mon), 506 (A04, Thu)
Gallego, Lucia	933 (B08, Wed)
Gallenkamp, Charlotte	1757 (I05, Wed)
Gallo, Alessandro	1495 (I02, Sun), 1749 (I05, Wed)
Galvez-Aranda, Diego	156 (A02, Mon)
Gamby, Jean	2125 (M03, Thu)
Gamero T, Milenka	156 (A02, Mon)
Gan, Hong	536 (A05, Mon)
Gan, Lu	1032 (D01, Tue)
Ganci, Fabrizio	1541 (I02, Wed)
Gandrud, Knut	148 (A02, Mon), 285 (A02, Tue)
Ganguly, Antra	2111 (M03, Wed)
Ganguly, Ronit	2037 (M01, Wed)
Ganin, Alexey	1383 (I01, Sun), 1386 (I01, Sun)
Ganta, Deepak	2100 (M03, Wed)
Gao, Han	306 (A02, Wed)
Gao, Hui	988 (C01, Mon)
Gao, Ping	1561 (I02, Wed), 2019 (M01, Tue), 2097 (M03, Wed)
Gao, Pu-Xian	1329 (H02, Tue)
Gao, Qiang	2261 (Z03, Mon)
Gao, Wei	1367 (H03, Wed), 1377 (H03, Wed)
Gao, Xiao	1572 (I02, Thu)
Gao, Xin	1104 (F03, Tue)
Gao, Xuefei	2091 (M03, Wed)
Gao, Yan	216 (A02, Mon), 308 (A02, Wed)
Gao, Zan	651 (B01, Thu)
Garbarino, Sebastien	1978 (L04, Tue)
Garcés-Pinedaa, Felipe	1995 (L04, Wed)
Garcia, Juan	1994 (L04, Wed)
Garcia, Susana	1705 (I05, Mon)
Garcia-Cabezon, Cristina	899 (B08, Tue)
Garcia-Hernandez, Celia	899 (B08, Tue)
García-Salaberri, Pablo	441 (A03, Wed)
Garg, Raghav	666 (B02, Wed)
Garich, Holly	1099 (F02, Mon)
Garland, Nancy	1820 (I06, Wed)
Garrick, Taylor	293 (A02, Tue)
Garrity, Oisín	704 (B03, Mon)
Garzon, Fernando	1676 (I04, Tue), 1678 (I04, Tue), 1685 (I04, Tue), 1792 (I06, Mon)
Gaskins, John	1171 (G01, Mon), 1187 (G01, Tue), 1281 (H01, Tue)
Gasper, Paul	1724 (I05, Tue)
Gasteiger, Hubert	146 (A02, Sun), 510 (A05, Sun), 559 (A05, Tue), 1793 (I06, Mon)
Gatemala, Harnchana	275 (A02, Tue)
Gattu, Bharat	48 (A01, Tue), 50 (A01, Tue)

Author	Abs No.
Gaubicher, J.	10 (A01, Sun)
Gaur, Bharti	1578 (I02, Thu)
Gautam, Rajendra	1778 (I05, Thu)
Ge, Mingyuan	1696 (I05, Sun)
Ge, Ruijing	825 (B06, Mon)
Ge, Shanhai	397 (A02, Thu)
Geary, Timothy	13 (A01, Sun)
Gebhard, Max	1460 (I01, Thu)
Gebhard, Michael	2082 (M03, Tue)
Geiger, Simon	1410 (I01, Tue), 1442 (I01, Wed)
Geise, Natalie	496 (A04, Thu)
Geisendorfer, Nicholas	12 (A01, Sun)
Geisz, John	1633 (I03, Tue)
Gendensuren, Bolormaa	208 (A02, Mon)
Geng, Dongsheng	1392 (I01, Mon), 1924 (L01, Wed)
George, Ian	607 (A06, Wed)
Georgescu, Nicholas	2265 (Z03, Mon)
Geramifard, Negar	89 (A01, Wed), 2160 (Z01, Tue)
Gerdes, Kirk	1718 (I05, Tue), 1727 (I05, Tue)
Gerhardt, Michael	1502 (I02, Mon)
Gerroll, Benjamin	1881 (K03, Wed)
Gerthsen, Dagmar	1119 (F03, Tue)
Gestin, Mathilde	1021 (C01, Wed)
Geto, Alemnew	2021 (M01, Wed)
Gewirth, Andrew	158 (A02, Mon), 175 (A02, Mon), 354 (A02, Thu), 897 (B07, Tue), 1070 (F01, Wed), 1624 (I03, Tue)
Ghaddab, Boutheina	834 (B06, Tue)
Ghadge, Shrinath	1434 (I01, Wed)
Ghahremani, Raziye	1095 (F01, Thu), 1455 (I01, Wed)
Ghashghaie, Sasan	550 (A05, Mon)
Ghatak, Kamalika	144 (A02, Sun), 806 (B06, Sun)
Ghazavi, Atefeh	1847 (K01, Mon)
Ghibaud, Gerard	1239 (G03, Tue)
Ghibaud, Gerard	1198 (G01, Wed)
Ghobadi, Sajjad	1899 (L01, Mon)
Ghorbanian, Mahyar	1104 (F03, Tue)
Ghosh, Anupama	756 (B04, Thu)
Ghosh, Chanchal	1699 (I05, Mon)
Ghosh, Sourav	141 (A02, Sun)
Ghosh, Souvik	1683 (I04, Tue)
Ghosh, Sujoy	2089 (M03, Wed)
Ghoshal, Shraboni	1422 (I01, Tue)
Giambra, Dominic	1244 (G03, Tue)
Gianellini, Matteo	406 (A03, Mon)
Giaume, Domitille	284 (A02, Tue)
Gibbons, Brenna	1749 (I05, Wed)
Gibbons, John	2265 (Z03, Mon)
Gibertini, Eugenio	406 (A03, Mon)
Gigli, Carlo	660 (B02, Tue), 660 (B01-09, Tue)
Gilbert, Richard	1855 (K01, Mon)
Giles, Spencer	1991 (L04, Wed)
Gillard, Tim	1827 (I06, Wed)
Gillen, Alice	660 (B02, Tue), 660 (B01-09, Tue), 662 (B01-09, Tue), 662 (B02, Tue), 690 (B02, Thu), 720 (B03, Tue)
Gilljam, Martin	566 (A06, Mon)
Gillmore, Jason	412 (A03, Mon), 413 (A03, Mon)
Gilmer, Dustin	451 (A03, Wed)
Gimenez, Iara	2068 (M02, Wed)
Giroud, Fabien	1904 (L01, Tue)
Girovsky, Jan	920 (B08, Wed)
Gittleman, Craig	1817 (I06, Wed)
Giubertoni, Damiano	251 (A02, Tue)
Gjestila, Marinela	251 (A02, Tue)
Glas, Jessica	687 (B02, Thu)
Glass, Jeffrey	1880 (K03, Wed)
Go, Lance	2046 (M01, Wed)
Gobeze, Habtom	912 (B08, Tue), 912 (B01-09, Tue)

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Gobeze, Haptom	782 (B05, Mon)	Grabow, Lars	1896 (L01, Mon)	Guo, Jinghua	351 (A02, Thu)
Gochi-Ponce, Yadira	1476 (I02, Sun)	Graczyk, Donald	599 (A06, Wed)	Guo, Kevin	204 (A02, Mon)
Godinez-Salomon, Fernando	1463 (I01, Thu)	Graf, Arko	743 (B03, Wed)	Guo, Qinglei	1368 (H03, Wed)
Goel, Sanket	1543 (I02, Wed)	Graham, Gabe	1125 (F04, Tue)	Guo, Xiaojing	1748 (I05, Wed)
Goeltl, Florian	846 (B06, Tue)	Graham, Kenneth	857 (B07, Sun)	Guo, Yuqi	1811 (I06, Tue)
Goenaga, Gabriel	432 (A03, Tue)	Graika, Jason	587 (A06, Tue)	Guo, Zhansheng	45 (A01, Mon), 395 (A02, Thu)
Gofron, Kazimierz	1696 (I05, Sun)	Grange, Elodie	10 (A01, Sun)	Gupta, Abhay	126 (A02, Sun), 497 (A04, Thu)
Gogotsi, Yury	815 (B06, Mon), 817 (B06, Mon)	Granitzer, Petra	1114 (F03, Tue), 1115 (F03, Tue)	Gupta, Amit	330 (A02, Wed)
Gokoglan, Tugba Ceren	441 (A03, Wed)	Granzier-Nakajima	804 (B06, Sun)	Gupta, Devanshi	331 (A02, Wed)
Gokus, Tobias	962 (B09, Wed)	Grassi, Roberto	1232 (G03, Tue)	Gupta, Prashant	90 (A01, Wed)
Gold, Benjamin	1723 (I05, Tue)	Gravely, Mitchell	685 (B02, Thu), 694 (B03, Mon)	Gupta, Ram	36 (A01, Mon)
Golden, Teresa	1002 (C01, Tue), 1018 (C01, Tue)	Graverson, Carolyn	2156 (Z01, Tue), 2163 (Z01, Tue)	Gupta, Ram B.	1630 (I03, Tue)
Golden, Teresa	1016 (C01, Tue), 1017 (C01, Tue), 1026 (C01, Wed)	Graves, John	1073 (F01, Wed)	Gupton, B.	1899 (L01, Mon)
Goldin, Mark	1850 (K01, Mon), 1851 (K01, Mon)	Grazioli, Davide	1944 (L03, Mon), 1945 (L03, Mon)	Gureviciene, Vidute	1096 (F01, Thu)
Goldsmith, Bryan	438 (A03, Wed), 1662 (I03, Thu)	Greeley, Jeffrey	332 (A02, Wed), 1126 (F04, Tue), 1498 (I02, Mon), 1546 (I02, Wed)	Gurrentz, Joseph	1643 (I03, Wed)
Golodnitsky, Diana	300 (A02, Wed)	Green, Johnny	1437 (I01, Wed)	Gutierrez, Arturo	262 (A02, Tue), 334 (A02, Wed)
Golodnitsky, Diana	486 (A04, Wed)	Green, Peter	584 (A06, Tue)	Gutiérrez Tinoco, Oliver	1091 (F01, Thu), 1612 (I03, Mon), 1625 (I03, Tue)
Golrokh Amin, Bahar	2038 (M01, Wed)	Greene, Bill	1043 (D01, Wed)	Guyomard, Dominique	10 (A01, Sun)
Golub, Tatiana	1834 (K01, Mon)	Greene, Winfield	1424 (I01, Tue)	Guzman, Carlos	2100 (M03, Wed)
Gomadani, Parthasarathy	1137 (F04, Wed)	Greenlee, Lauren	1426 (I01, Tue), 1451 (I01, Wed), 1677 (I04, Tue), 2242 (Z02, Mon)	Guzman, Marcelo	1591 (I03, Sun)
Gomes, Adriano	1094 (F01, Thu)	Greenwood, David	107 (A01, Thu)	Gyenge, Elod	1552 (I02, Wed)
Gomez, Jamie	1685 (I04, Tue)	Grew, Kyle	1695 (I05, Sun), 1736 (I05, Wed)		
Gonçalves, Anne-Marie	1206 (G02, Tue), 1213 (G02, Tue), 1220 (G02, Wed), 1224 (G02, Wed)	Grey, Clare	558 (A05, Tue)		
Gonçalves, Emerson	752 (B01-04, Tue)	Grimaudo, Valentine	1060 (E01, Wed)		
Gonçalves, Renato	1288 (H01, Tue), 2250 (Z02, Mon)	Grindal, Andrew	1517 (I02, Tue)		
Gonçalves, Roger	611 (B01-09, Tue), 611 (B01, Tue)	Grobis, Micheal	1171 (G01, Mon)		
Gond, Ritambhara	121 (A02, Sun), 563 (A05, Tue)	Gronbech-Jensen, Niels	1949 (L03, Mon)		
Gong, Bailey	976 (C01, Mon)	Gros, Pierre	2010 (M01, Tue)		
Gong, Chenggong	2098 (M03, Wed)	Gross, Andrew	1904 (L01, Tue)		
Gong, Jue	2 (A01, Sun)	Grosso, Christopher	599 (A06, Tue)		
Gong, Qing	1548 (I02, Wed)	Grover, Nitika	906 (B01-09, Tue), 906 (B01-09, Tue)		
Gonzalez, Gabriel	294 (A02, Tue)	Grueneis, Alexander	845 (B06, Tue), 852 (B01-09, Tue), 852 (B06, Tue)		
Gonzalez, Gabriel	184 (A02, Mon)	Grundish, Nicholas	1425 (I01, Tue), 178 (A02, Mon)		
Gonzalez, Gabriel	185 (A02, Mon)	Grundish, Nicholas	178 (A02, Mon)		
González, I	116 (A02, Sun)	Grunlan, Jaime	621 (B01, Wed)		
González, Jesús	1243 (G03, Tue)	Gryko, Dorota	932 (B08, Wed)		
Gonzalez, Ramiro	186 (A02, Mon)	Gu, Fei	226 (A02, Mon)		
González-García, María	1914 (L01, Tue)	GU, Qiao	2019 (M01, Tue)		
González-García, María	1917 (L01, Wed)	Gu, Wenbin	1504 (I02, Mon)		
Gonzalez-Rodriguez, Roberto	617 (B01, Tue), 617 (B01-09, Tue), 663 (B01-09, Tue), 663 (B02, Tue), 665 (B02, Wed), 1115 (F03, Tue)	Gu, Yanhong	988 (C01, Mon), 1004 (C01, Tue)		
Goodenough, John	31 (A01, Mon), 178 (A02, Mon)	Gu, Yuqian	825 (B06, Mon)		
Goodenough, John	1425 (I01, Tue)	Gualous, Hamid	1089 (F01, Wed)		
Goodman, Angela	2024 (M01, Wed)	Guan, Pengjian	602 (A06, Wed)		
Goor, Meital	486 (A04, Wed)	Guan, Runnan	797 (B05, Tue), 797 (B01-09, Tue)		
Goornavar, Virupaxi	2237 (Z01, Tue)	Guarr, Evan	1683 (I04, Tue)		
Gopalan, Padma	695 (B03, Mon)	Guarr, Thomas	412 (A03, Mon), 413 (A03, Mon)		
Gopalan, Raghavan	492 (A04, Wed)	Guay, Daniel	1978 (L04, Tue)		
Gopalan, Srikanth	1714 (I05, Tue), 1724 (I05, Tue)	Gudla, Harish	1943 (L03, Mon)		
Gordeev, Georgy	704 (B03, Mon)	Guenot, Benoît	1439 (I01, Wed)		
Gordon, John	448 (A03, Wed)	Guérain, Mathieu	1021 (C01, Wed)		
Gordon, Roy	407 (A03, Mon)	Guerfi, Abdelbast	1766 (I05, Thu)		
Goroncharovskaya, Irina	1850 (K01, Mon), 1851 (K01, Mon)	Guerrero, Trent	1540 (I02, Wed)		
Gorte, Raymond	1725 (I05, Tue)	Guignard, Marie	14 (A01, Mon)		
Goto, Ken	1262 (H01, Mon)	Guillemoles, Jean François	1230 (G02, Wed)		
Gottesfeld, Shimshon	1795 (I06, Mon)	Guillon, Olivier	1728 (I05, Tue)		
Goudarzi, Mohsen	1945 (L03, Mon)	Guisinger, Nathan	840 (B06, Tue)		
Goulet, Marc-Antoni	407 (A03, Mon)	Guiton, Beth	1591 (I03, Sun)		
Gourdin, Gerald	7 (A01, Sun)	Guldi, Dirk	780 (B05, Mon), 934 (B08, Wed)		
Govindarajan, Rubenthiran	1534 (I02, Wed)	Gulgun, Mehmet	53 (A01, Tue)		
Govorov, Alexander	1644 (I03, Wed)	Guizar, Umair	251 (A02, Tue)		
Govorov, Alexander	1617 (I03, Tue)	Gumeci, Cenk	1821 (I06, Wed)		
		Gunji, Takao	2139 (Z01, Tue), 2140 (Z01, Tue)		
		Gunji, Takao	2138 (Z01, Tue)		
		Guo, Changqing	1430 (I01, Wed), 1452 (I01, Wed)		
		Guo, Hui	190 (A02, Mon), 200 (A02, Mon), 613 (B01, Tue), 613 (B01-09, Tue), 1419 (I01, Tue)		

H

Ha, Heung Yong	1085 (F01, Wed)
Ha, Hyunwoo	1393 (I01, Mon)
Ha, Mai-Anh	1441 (I01, Wed)
Ha, Phuc	1838 (K01, Mon)
Ha, Yoon-Cheol	37 (A01, Mon)
Haarberg, Geir Martin	2247 (Z02, Mon)
Habibi-Rezaei, Mehran	961 (B09, Wed)
Habisreutinger, Severin	724 (B03, Tue)
Hack, Jennifer	1474 (I02, Sun)
Hackett, Gregory	1718 (I05, Tue)
Hackney, Stephen	528 (A05, Mon)
Hadad, Caroline	151 (A02, Mon)
Haddad, Clara	1239 (G03, Tue)
Hadler-Jacobsen, Jacob	125 (A02, Sun), 816 (B06, Mon)
Hagan, Scott	2079 (M03, Tue)
Hahn, Christopher	1919 (L01, Wed)
Hahn, Nathan	350 (A02, Thu), 351 (A02, Thu)
Haidar, Fatima	1975 (L04, Tue)
Haifeng, Zhang	1012 (C01, Tue)
Hailu, Yohannes	1953 (L03, Mon)
Haino, Takeharu	935 (B08, Wed)
Hajduk, Andreas	1207 (G02, Tue), 2221 (Z01, Tue)
Halada, Gary	1003 (C01, Tue)
Halder, Aditi	509 (A04, Thu)
Hall, Charles	515 (A05, Sun)
Hall, Derek	2018 (M01, Tue)
Hall, Timothy	966 (B09, Wed), 1099 (F02, Mon)
Hallinan, Daniel	522 (A05, Sun)
Hallstrom, Eric	979 (C01, Mon), 980 (C01, Mon)
Halpern, Jeffrey	1872 (K03, Wed)
Hamann, Kathryn	1209 (G02, Tue)
Hamann, Thomas	1226 (G02, Wed)
Hamerton, Ian	1734 (I05, Wed)
Hammar, Ryan	429 (A03, Tue)
Hammond, Carly	2153 (Z01, Tue)
Hammond, Jules	1904 (L01, Tue)
Han, Dong-Hoon	1179 (G01, Mon)
Han, Gwon Deok	1755 (I05, Wed), 1756 (I05, Wed), 1760 (I05, Wed), 1762 (I05, Wed)
Han, Gwon Deok	1645 (I03, Wed)
Han, Hyunsoo	1751 (I05, Wed)
Han, Jong-Hun	196 (A02, Mon)
Han, Jung	1260 (H01, Mon)
Han, Kai	1666 (I03, Thu)
Han, Lili	1672 (I04, Tue)
Han, Qi	2265 (Z03, Mon)
Han, Ruirui	2056 (M02, Wed)
Han, Sangwoo	105 (A01, Thu), 394 (A02, Thu), 597 (A06, Wed)

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Han, Seung Min	65 (A01, Tue)	Heenan, Thomas	512 (A05, Sun), 543 (A05, Mon)	Hirota, Inomata	2259 (Z03, Mon)
Han, Wei	1084 (F01, Wed)	Heider, Emanuel	181 (A02, Mon)	Hiroto, Satoru	903 (B08, Tue)
Han, Wei	1086 (F01, Wed), 1087 (F01, Wed)	Heinze, Katja	918 (B08, Wed), 919 (B08, Wed)	Hirsch, Lionel	869 (B07, Mon)
Han, Xiaoxiao	131 (A02, Sun)	Heinzel, Angelika	416 (A03, Mon)	Hirst, Elizabeth	1354 (H03, Tue)
Han, Xuebing	530 (A05, Mon), 593 (A06, Tue)	Heli, Jens Peter	1069 (F01, Wed)	Hisaeda, Yoshio	1864 (K02, Tue)
Hanatan, Syunsuke	1217 (G02, Tue)	Heligman, Brian	249 (A02, Tue)	Hisatomi, Takashi	1603 (I03, Sun)
Hangarter, Carlos	976 (C01, Mon)	Hell, Martin	852 (B06, Tue), 852 (B01-09, Tue)	Hisatsune, Kazuya	77 (A01, Wed)
Hankins, Kie	276 (A02, Tue)	Heller, Adam	183 (A02, Mon), 312 (A02, Wed), 342 (A02, Wed)	Hitomi, Shuji	390 (A02, Thu)
Hao, Fang	473 (A04, Wed)	Heller, Daniel	682 (B02, Thu), 691 (B02, Thu), 721 (B03, Tue), 747 (B03, Wed)	Ho, Cheng-En	1058 (E01, Wed), 2172 (Z01, Tue)
Hao, Ji	727 (B03, Tue)	Heller, William	200 (A01, Mon)	Ho, Ching-Kit	428 (A03, Tue)
Hara, Masanori	1432 (I01, Wed)	Hellstern, Thomas	1380 (I01, Sun)	Ho, Donna	1820 (I06, Wed)
Harada, Yasuhiro	172 (A02, Mon)	Hemmatifar, Ali	1068 (F01, Wed)	Hoang, Thao	897 (B07, Tue)
Haraguti, Tomohiro	189 (A02, Mon)	Henckel, Danielle	1070 (F01, Wed), 1624 (I03, Tue)	Hobart, Karl	1274 (H01, Tue)
Haram, Santosh	1897 (L01, Mon)	Hendrickson, Christopher	786 (B05, Mon)	Hoener, Benjamin	1912 (L01, Tue), 1926 (L01, Wed)
Harb, John	1079 (F01, Wed)	Hendrickson, Mary	270 (A02, Tue)	Hoff, Andrew	1855 (K01, Mon)
Hardwick, Laurence	119 (A02, Sun), 481 (A04, Wed), 524 (A05, Sun)	Henry, Michael	2000 (M01, Mon)	Hofferber, Eric	687 (B02, Thu)
Haremski, Patricia	1150 (F04, Wed), 1752 (I05, Wed)	Henton, Daniel	413 (A03, Mon)	Hoffmann, Alice	181 (A02, Mon)
Haridoss, Prathap	492 (A04, Wed)	Heo, Jineun	1660 (I03, Thu)	Hoffrogge, Paul	1150 (F04, Wed), 1752 (I05, Wed)
Harpak, Nimrod	300 (A02, Wed)	Her, Jim	2033 (M01, Wed), 2034 (M01, Wed)	Högele, Alexander	718 (B03, Tue)
Harris, Joel	813 (B06, Mon), 1573 (I02, Thu), 1905 (L01, Tue)	Herb, Jake	286 (A02, Tue), 342 (A02, Wed)	Holby, Edward	1429 (I01, Wed), 1489 (I02, Sun), 1499 (I02, Mon)
Harrison, Elisa	521 (A05, Sun)	Herbert, Erik	528 (A05, Mon)	Holden, William	534 (A05, Mon)
Hartmann, Gregory	1494 (I02, Sun)	Herbert-Walters, Meghan	311 (A02, Wed)	Holladay, Jamelyn	1091 (F01, Thu), 1625 (I03, Tue)
Hartmann, Nicolai	962 (B09, Wed)	Hernandez, Tyler	21 (A01, Mon), 1927 (L01, Wed)	Hollas, Aaron	417 (A03, Tue)
Harutyunyan, Avetik	396 (A02, Thu), 652 (B01, Thu)	Hernández-Santos, David	1914 (L01, Tue)	Holler, Mirko	1701 (I05, Mon)
Harvey, Jackson	721 (B03, Tue), 747 (B03, Wed)	Hernández-Santos, David	1917 (L01, Wed)	Hollowell, Andrew	1195 (G01, Wed), 1196 (G01, Wed)
Harzer, Gregor	1793 (I06, Mon)	Herranz, Juan	1405 (I01, Mon)	Holmes-Gentle, Isaac	1635 (I03, Tue)
Hasan, Md Tanvir	617 (B01, Tue), 617 (B01-09, Tue), 663 (B02, Tue), 663 (B01-09, Tue), 665 (B02, Wed)	Herring, Andrew	1974 (L04, Tue), 2242 (Z02, Mon)	Holsteyns, Frank	1227 (G02, Wed)
Hasanzadehshirazi, Mehmaz	1896 (L01, Mon)	Herrmann, Christoph	367 (A02, Thu)	Holstun, Tucker	362 (A02, Thu)
Hase, Yoko	2145 (Z01, Tue)	Herrmann, Niklas	722 (B03, Tue)	Homma, Takayuki	1127 (F04, Tue), 2173 (Z01, Tue)
Hashim, Ibrahim	2105 (M03, Wed)	Herron, Jeff	1800 (I06, Tue)	Honarfar, Alireza	1661 (I03, Thu)
Hashimoto, Wataru	703 (B03, Mon)	Hersam, Mark	725 (B03, Tue), 841 (B06, Tue)	Hong, Hyeonaug	1835 (K01, Mon)
Hashimoto, Yusuke	838 (B06, Tue)	Hesketh, Peter	2027 (M01, Wed), 2120 (M03, Thu)	Hong, Jong-Eun	1144 (F04, Wed), 1759 (I05, Wed), 1765 (I05, Wed)
Haskins, Justin	347 (A02, Thu), 1961 (L03, Tue)	Heythem, Salhi	1371 (H03, Wed)	Hong, Ki-Ha	861 (B07, Sun)
Hasobe, Taku	891 (B07, Tue)	Hibbs, Michael	1575 (I02, Thu)	Hong, Liang	482 (A04, Wed)
Hassan, Ali	426 (A03, Tue)	Hibino, Yusuke	838 (B06, Tue)	Hong, Seokjun	80 (A01, Wed)
Hatada, Mika	1840 (K01, Mon)	Hickey, David	52 (A01, Tue)	Hong, Suklyun	1292 (H01, Wed)
Hatton, Benjamin	1117 (F03, Tue)	Hickner, Michael	1826 (I06, Wed), 1889 (L01, Mon), 1957 (L03, Tue)	Hong, Tao	2015 (M01, Tue), 2028 (M01, Wed)
Hatton, T.	1068 (F01, Wed)	Hideshima, Sho	1524 (I02, Tue), 1560 (I02, Wed)	Hong, Young Joon	1292 (H01, Wed)
Hattori, Masashi	388 (A02, Thu)	Hidrovo, Carlos	1110 (F03, Tue), 1967 (L03, Tue)	Hong, Youngmin	1689 (I04, Tue)
Hatzell, Marta	1682 (I04, Tue), 1684 (I04, Tue)	Hietzschold, Sebastian	1867 (K02, Tue), 2263 (Z03, Mon)	Hong, Yu-Fang	1080 (F01, Wed)
Haupt, John	1092 (F01, Thu)	Higashi, Masanobu	1634 (I03, Tue)	Honma, Saika	1097 (F01, Thu)
Hausbrand, René	93 (A01, Thu)	Higashino, Tomohiro	953 (B08, Thu)	Honno, Tomohiro	1846 (K01, Mon)
Haussener, Sophia	1635 (I03, Tue)	Higashiwaki, Masataka	1262 (H01, Mon)	Hopkins, Brandon	1769 (I05, Thu)
Havens, Mallory	1856 (K01, Mon)	Hihara, Takehiko	355 (A02, Thu)	Hopkins, Patrick	804 (B06, Sun), 1281 (H01, Tue), 1171 (G01, Mon), 1187 (G01, Tue), 1279 (H01, Tue), 1290 (H01, Wed)
Hawkins, Brendan	545 (A05, Mon)	Hihara, Takehiko	1064 (E01, Wed)	Hoque, Ariful	1591 (I03, Sun)
Hawks, Steven	1066 (F01, Wed)	Hilger, André	539 (A05, Mon)	Hori, Atsushi	1181 (G01, Tue)
Hawtof, Ryan	1683 (I04, Tue)	Hill, Jonathan	937 (B08, Wed)	Horne, Mike	1078 (F01, Wed)
Hayashi, Narumi	2139 (Z01, Tue), 2140 (Z01, Tue)	Hill, Justin	1775 (I05, Thu)	Hornebecq, Virginie	150 (A02, Mon), 1111 (F03, Tue)
Haynes, Zion	59 (A01, Tue)	Hill, Madison	2156 (Z01, Tue)	Horny, Marie-Charlotte	2125 (M03, Thu)
He, Fan	1068 (F01, Wed)	Hillier, Andrew	1895 (L01, Mon)	Horton, Matthew	360 (A02, Thu)
He, Jiarui	127 (A02, Sun), 188 (A02, Mon)	Hilmi, Abdelkader	13 (A01, Sun)	Hosaka, Tomooki	143 (A02, Sun), 235 (A02, Mon)
He, Jin	1334 (H02, Wed)	Himeda, Yuya	1197 (G01, Wed)	Hoshi, Yoshinao	984 (C01, Mon)
He, Nanfei	1377 (H03, Wed)	Himmel, Hans-Joerg	1240 (G03, Tue)	Hoshii, Takuya	77 (A01, Wed), 1181 (G01, Tue), 1294 (H01, Wed)
He, Peng	498 (A04, Thu)	Himori, Shogo	1302 (H02, Mon)	Hoshina, Keigo	172 (A02, Mon)
He, Qianran	246 (A02, Tue), 336 (A02, Wed), 361 (A02, Thu)	Hinds, Gareth	64 (A01, Tue)	Hosmane, Narayan	2 (A01, Sun)
He, Xiangming	582 (A06, Tue), 588 (A06, Tue), 593 (A06, Tue)	Hines, Melissa	1219 (G02, Wed)	Hosokawa, Toshihiro	2143 (Z01, Tue)
He, Xiaoqing	308 (A02, Wed)	Hippes, K. W.	916 (B08, Wed), 917 (B08, Wed)	Hossain, Imran	2098 (M03, Wed)
He, Xiaowei	745 (B03, Wed)	Hirai, Nobumitsu	671 (B02, Wed), 1097 (F01, Thu), 1869 (K02, Tue)	Hossain, Md	2001 (M01, Mon)
He, Xinzi	134 (A02, Sun)	Hirai, Takahiro	1421 (I01, Tue)	Hossain, mohammad Kabir	1648 (I03, Wed), 1665 (I03, Thu)
He, Xun	2144 (Z01, Tue)	Hirano, Shinichi	1103 (F03, Tue)	Hosseini, Amin	2084 (M03, Wed)
He, Yang	257 (A02, Tue)	Hirano, Shinya	1043 (D01, Wed)	Hosseini, Seyyedamirhossein	1102 (F02, Mon)
He, Yufang	310 (A02, Wed), 1160 (F04, Thu)	Hirata, Mizuki	1074 (F01, Wed)	Hosseini, Seyyedamirhossein	1863 (K02, Tue), 1871 (K02, Tue)
He, Zizhou	190 (A02, Mon), 200 (A02, Mon), 613 (B01, Tue), 613 (B01-09, Tue), 1419 (I01, Tue)	Hirato, Tetsuji	1074 (F01, Wed)		
Hebert, Kurt	1142 (F04, Wed)	Hirmez, Benel	2056 (M02, Wed)		
Hedhili, Mohammed	227 (A02, Mon)	Hirose, Fumihiko	2181 (Z01, Tue)		

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Hosseini, Soraya	5 (A01, Sun)	Huang, Yu-Jie	1304 (H02, Mon)	Ingole, Pravin	1458 (I01, Wed)
Hosseini Jebeli, Seyyed Ali	1912 (L01, Tue)	Huang, Zhongjie	711 (B03, Tue)	Iniguez, Benjamin	1232 (G03, Tue)
Hosseini Narouei, Farideh	2011 (M01, Tue)	Huang, Zhongyuan	1886 (L01, Mon)	Iniguez, Benjamin	1239 (G03, Tue)
Hossen, Md Mir	1895 (L01, Mon)	Hubert, McKenzie	1428 (I01, Wed)	Inman, Maria	966 (B09, Wed), 1099 (F02, Mon)
Hoshii, Hiroyoshi	1853 (K01, Mon)	Hubička, Zdeněk	1667 (I03, Thu)	Ino, Kosuke	1845 (K01, Mon)
Hou, Chenjun	1563 (I02, Wed)	Huda, Mohammad Nurul	856 (B07, Sun), 1468 (I01, Thu), 1962 (L03, Tue)	Inoue, Kumi	1845 (K01, Mon)
Hou, Tianhong	1152 (F04, Thu)	Huda, Muhammad	1295 (H01, Wed), 1596 (I03, Sun)	Inoue, Taiki	624 (B01, Wed), 709 (B03, Mon)
Hou, Zhaozhao	1174 (G01, Mon), 1175 (G01, Mon)	Huerta, Nicolas	1000 (C01, Tue)	Inoue, Takato	355 (A02, Thu)
Hou, Zhichao	530 (A05, Mon)	Huet, Karim	1183 (G01, Tue)	Inoue, Takeshi	2143 (Z01, Tue)
Houle, Frances	1619 (I03, Tue)	Hughes, Barbara	311 (A02, Wed)	Inukai, Junji	1798 (I06, Tue)
Houser, Jacob	443 (A03, Wed)	Huie, Matthew	1055 (E01, Wed)	Iriyama, Takuto	573 (A06, Mon)
Hovancová, Jana	1933 (L02, Tue)	Humphrey, Nicholas	2030 (M01, Wed)	Irshad, Ahamed	270 (A02, Tue)
Howard, Bret	1996 (L04, Wed)	Hung, Chen-Hsiung	905 (B08, Tue)	Isaac, Ibanga	1006 (C01, Tue)
Howell, Benjamin	504 (A04, Thu)	Hung, Pei-Sung	1076 (F01, Wed), 1113 (F03, Tue)	Isgor, O. Burkan	994 (C01, Tue), 995 (C01, Tue), 1001 (C01, Tue)
Howell, Pauline	1221 (G02, Wed)	Hurst, Katherine	1422 (I01, Tue)	Isheim, Dieter	555 (A05, Tue)
Howey, David	455 (A03, Wed)	Hus, Saban	825 (B06, Mon)	Ishibashi, Tomoaki	1043 (D01, Wed)
Hsieh, Cheng-Ta	495 (A04, Thu)	Hussain, Fayyaz	2222 (Z01, Tue)	Ishihara, Akimitsu	1423 (I01, Tue)
Hsieh, Chien-TE	2050 (M01, Wed)	Hussey, Daniel	1741 (I05, Wed)	Ishihara, Akimitsu	1505 (I02, Mon)
Hsieh, Ching-Yen	1303 (H02, Mon), 1312 (H02, Mon)	Hwang, Bing-Joe	128 (A02, Sun), 1090 (F01, Thu), 1400 (I01, Mon), 1408 (I01, Tue)	Ishihara, Seiya	838 (B06, Tue)
Hsu, Chun-Han	343 (A02, Wed)	Hwang, Byung Keun	1188 (G01, Tue)	Ishii, Akihiro	741 (B03, Wed), 744 (B03, Wed)
Hsu, Hungjen	579 (A06, Tue), 581 (A06, Tue), 582 (A06, Tue)	Hwang, Cheol Seong	1178 (G01, Mon), 2164 (Z01, Tue)	Ishii, Katsutoshi	1228 (G02, Wed)
Hsu, Kuo-Min	991 (C01, Mon)	Hwang, Gyeong	99 (A01, Thu), 644 (B01, Thu), 1494 (I02, Sun), 1947 (L03, Mon)	Ishii, Satoshi	2230 (Z01, Tue)
Hsu, Wei-En	1304 (H02, Mon)	Hwang, Jang-Yeon	225 (A02, Mon)	Ishikawa, Masato	838 (B06, Tue)
Hsueh, Ting-Jen	2009 (M01, Tue)	Hwang, Monica	1514 (I02, Tue)	Ishimori, Koichiro	940 (B08, Thu)
Htoon, Han	742 (B03, Wed), 745 (B03, Wed)	Hwang, Sangyeon	28 (A01, Mon)	Ishizuka, Tomoya	902 (B08, Tue)
Hu, Bin	292 (A02, Tue)	Hwang, Soo Min	2132 (Z01, Tue)	Isimjan, Tayirjan	1663 (I03, Thu), 1664 (I03, Thu)
Hu, Chao-kun	1055 (E01, Wed)	Hwang, Su Min	1188 (G01, Tue)	Islam, Ahmad	1370 (H03, Wed)
HU, Chen	2211 (Z01, Tue)	Hwang, Taesoon	2128 (Z01, Tue)	Islam, Md.	1524 (I02, Tue)
Hu, Chi-Chang	495 (A04, Thu)	Hwang, Taesoon	2127 (Z01, Tue)	Islam, Mohammad	680 (B02, Thu)
Hu, Jue	1101 (F02, Mon), 1448 (I01, Wed), 1557 (I02, Wed), 1763 (I05, Wed)	Hwang, Wonchan	1503 (I02, Mon)	Islam, Rafiqul	1843 (K01, Mon)
Hu, Linhua	386 (A02, Thu)	Hwu, Jenn-Gwo	1199 (G01, Wed)	Islam, Shakirul	1927 (L01, Wed)
Hu, Po-Yuan	1286 (H01, Tue)	Hyun, Seung Dam	1178 (G01, Mon)	Issac, Goutham	978 (C01, Mon), 1015 (C01, Tue)
Hu, Ren Zong	322 (A02, Wed)	Hyun, Seungmin	65 (A01, Tue)	Issac, Goutham	2166 (Z01, Tue)
Hu, Shu	1598 (I03, Sun)			Itagaki, Masayuki	984 (C01, Mon)
Hu, Yang	1053 (E01, Wed)			Ito, Kimihiko	209 (A02, Mon), 352 (A02, Thu)
Hu, Yi	884 (B07, Tue), 947 (B08, Thu)			Ito, Ryohei	938 (B08, Wed)
Hu, Yi	913 (B08, Tue), 913 (B01-09, Tue)			Ito, Shuji	447 (A03, Wed)
Hu, Zongyang	1267 (H01, Mon)			Ito, Takeshi	1217 (G02, Tue)
Hua, Duy	2087 (M03, Wed)			Ito, Yasuaki	1043 (D01, Wed)
Huang, Bryant	399 (A02, Thu)			Ito, Yuka	1935 (L02, Tue)
Huang, Chao-Yu	1081 (F01, Wed)			Itoh, Reo	671 (B02, Wed), 1869 (K02, Tue)
Huang, Chen-Jui	1090 (F01, Thu)	Iasemidis, Leonidas	2001 (M01, Mon)	Ivanov, Sergei	569 (A06, Mon)
Huang, Chen-Yuan	1032 (D01, Tue)	Ibáñez, David	1914 (L01, Tue)	Ivanovskaya, Anna	436 (A03, Tue)
Huang, Cheng-Yao	990 (C01, Mon)	Ibáñez, David	1917 (L01, Wed)	Ivers-Tiffée, Ellen	1119 (F03, Tue)
Huang, Chia-sheng	1167 (G01, Mon)	Ibrahim, Gafar	2213 (Z01, Tue)	Iverson, Nicole	687 (B02, Thu)
Huang, Chien-po	399 (A02, Thu)	Ida, Kazuhiko	143 (A02, Sun)	Iwai, Taichi	2143 (Z01, Tue)
Huang, Chiu Chang	1283 (H01, Tue)	Idriss, Hicham	1229 (G02, Wed), 1663 (I03, Thu), 1664 (I03, Thu)	Iwatsuka, Haruki	1181 (G01, Tue)
Huang, Gaoshan	1368 (H03, Wed)	Idrissi, Hassane	546 (A05, Mon), 557 (A05, Thu)	Iyuke, Sunny	51 (A01, Tue)
Huang, Garrett	1733 (I05, Wed)	Iglio, Rossella	748 (B03, Wed)	Izzet, Guillaume	1990 (L04, Wed)
Huang, Hsiao-Wen	3 (A01, Sun)	Ignjatovic, Aleksandar	515 (A05, Sun)		
Huang, Hsin-Chih	8 (A01, Sun)	Iguchi, Shoji	1525 (I02, Tue)	Jabbari, Faryar	2187 (Z01, Tue)
Huang, Hsin-Hui	1432 (I01, Wed)	Ihlefeld, Jon	1187 (G01, Tue)	Jablonskiene, Jolita	612 (B01, Tue), 612 (B01-09, Tue)
Huang, Huai	1055 (E01, Wed)	Iida, Keisuke	2223 (Z01, Tue)	Jackson, Christine	1263 (H01, Mon)
Huang, Jing-Fang	1323 (H02, Tue)	Iiyama, Akihiro	1798 (I06, Tue), 1956 (L03, Tue)	Jackson, Gregory	1729 (I05, Tue)
Huang, Jinhua	160 (A02, Mon)	Ike, Innocent	51 (A01, Tue)	Jacob, Chacko	848 (B01-09, Tue), 848 (B06, Tue)
Huang, Jui-Cheng	1304 (H02, Mon)	Ikebukuro, Kazunori	1840 (K01, Mon), 2227 (Z01, Tue)	Jacob, Stephanie	1239 (G03, Tue)
Huang, Kevin	1399 (I01, Mon)	Ikeda, Hiroshi	889 (B07, Tue)	Jacobberger, Robert	846 (B06, Tue), 847 (B06, Tue)
Huang, Kiu-Tshiong	1286 (H01, Tue)	Ikeda, Katsuyoshi	1915 (L01, Wed)	Jacobson, David	1741 (I05, Wed)
Huang, Kuo-Wei	1885 (L01, Mon)	Ikehata, Yuta	1545 (I02, Wed)	Jadhav, Ankur	535 (A05, Mon), 545 (A05, Mon)
Huang, Mianyan	403 (A03, Mon)	Ikeitani, Chinami	1421 (I01, Tue)	Jadhav, Yogesh	1897 (L01, Mon)
Huang, Qiang	1053 (E01, Wed), 1062 (E01, Wed)	Ikeuchi, Hayato	2269 (Z03, Mon)	Jadon, Nimsha	1900 (L01, Mon)
Huang, Qiang	795 (B05, Tue)	Im, Dongmin	344 (A02, Thu)	Jadwiszczak, Michal	1981 (L04, Tue)
Huang, Shan	573 (A06, Mon)	Im, Sang Won	2241 (Z02, Mon)	Jaegermann, Wolfram	93 (A01, Thu), 858 (B07, Sun), 2053 (M02, Wed)
Huang, Shengnan	701 (B03, Mon)	Imada, Hiroshi	741 (B03, Wed)	Jafari, Behnaz	2023 (M01, Wed)
Huang, Shu-Wen	1314 (H02, Mon)	Imahori, Hiroshi	793 (B05, Tue), 953 (B08, Thu)	Jafarzadeh, Siavash	999 (C01, Tue)
Huang, Xingkang	1300 (H02, Mon)	Imai, Hideto	1551 (I02, Wed), 1572 (I02, Thu)	Jafta, Charl	20 (A01, Mon), 248 (A02, Tue), 264 (A02, Tue), 541 (A05, Mon)
Huang, Xuhui	2019 (M01, Tue)	Imanishi, Akihito	893 (B07, Tue)	Jagadish, Chennupati	1706 (I05, Mon)
Huang, Yi-Chen	1340 (H02, Wed)	Imponenti, Luca	1729 (I05, Tue)	Jagannath, Badrinath	1941 (L02, Tue), 2051 (M01, Wed)
Huang, Yu	1438 (I01, Wed)	Inaba, Koichirou	189 (A02, Mon)	Jagota, Anand	693 (B03, Mon)
Huang, Yu-Chun	2009 (M01, Tue)	Inaba, Masanori	1554 (I02, Wed)		
Huang, Yu-Hsuan	1058 (E01, Wed), 2172 (Z01, Tue)	Inami, Yuta	1525 (I02, Tue)		
		Inatomi, Yuu	447 (A03, Wed)		
		Incl, Eren	320 (A02, Wed), 327 (A02, Wed)		

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Jahrman, Evan	534 (A05, Mon)	Jiang, Fachao	568 (A06, Mon)	Juneja, Rishabh	607 (A06, Wed)
Jain, Ankur	1138 (F04, Wed)	Jiang, Hongxing	1271 (H01, Mon)	Jung, Daewoong	730 (B03, Tue), 730 (B01-09, Tue)
Jain, Barsha	1167 (G01, Mon)	Jiang, Junhua	2104 (M03, Wed)	Jung, Daewoong	731 (B03, Tue), 731 (B01-09, Tue), 734 (B03, Tue), 734 (B01-09, Tue), 735 (B03, Tue), 735 (B01-09, Tue), 2041 (M01, Wed)
Jain, Prashant	877 (B07, Mon), 1608 (I03, Mon)	Jiang, Jyh-Chiang	1953 (L03, Mon)	Jung, Ha-Young	195 (A02, Mon), 196 (A02, Mon)
Jaiswal, Nandini	419 (A03, Tue)	Jiang, Kun	1629 (I03, Tue)	Jung, Hojae	206 (A02, Mon), 251 (A02, Tue)
Jampani, Prashanth	48 (A01, Tue)	Jiang, Shan	444 (A03, Wed)	Jung, Hyun Min	333 (A02, Wed)
Janáky, Csaba	808 (B06, Sun), 1621 (I03, Tue), 1658 (I03, Thu), 1661 (I03, Thu)	Jiang, Shun-Hong	197 (A02, Mon)	Jung, Kichang	226 (A02, Mon)
Jānes, Alar	142 (A02, Sun)	Jiang, Sisi	292 (A02, Tue)	Jung, Kyu-Nam	215 (A02, Mon), 219 (A02, Mon), 2131 (Z01, Tue)
Jang, Jun Ho	2241 (Z02, Mon)	Jiang, Wei	258 (A02, Sun)	Jung, Thomas	920 (B08, Wed)
Jang, Jun Ki	1193 (G01, Wed)	Jiang, Wen	1313 (H02, Mon)	Jung, Ui-Hyeon	882 (B07, Tue)
Jang, Kyung-In	1355 (H03, Tue)	Jiang, Yu	515 (A05, Sun)	Jung, WooChul	1722 (I05, Tue)
Jang, Seung Soon	648 (B01, Thu)	Jiao, Li	1384 (I01, Sun)	Jung, Ye Seul	803 (B06, Sun), 1358 (G03, Tue)
Jang, Soohwan	1282 (H01, Tue)	Jiao, Li	1394 (I01, Mon)	Jung, Yun-Chae	193 (A02, Mon)
Jang, Taejin	1128 (F04, Tue), 1129 (F04, Tue), 1153 (F04, Thu), 1154 (F04, Thu), 1156 (F04, Thu)	Jiao, Li	1402 (I01, Mon)	Jungjohann, Katherine	1699 (I05, Mon)
Jang, Yunseok	620 (B01, Tue), 620 (B01-09, Tue)	Jimenez, Daniel	1153 (F04, Thu)	Junquera-Pérez, Alejandro	1914 (L01, Tue)
Janik, Michael	1677 (I04, Tue)	Jimenez-Flores, Ivan	767 (B04, Thu)	Junquera-Pérez, Alejandro	1917 (L01, Wed)
Janish, Matthew	1699 (I05, Mon)	Jiménez-Morales, Ignacio	1975 (L04, Tue)	Jurchescu, Oana	1247 (G03, Wed)
Janke, Christopher	392 (A02, Thu)	Jiménez-Tejada, Juan	1243 (G03, Tue)	Jürgensen, Lasse	1616 (I03, Mon)
Janotti, Anderson	1627 (I03, Tue)	Jin, Binbin	41 (A01, Mon)	Jørgensen, Peter	1701 (I05, Mon)
Jansen, Andrew	368 (A02, Thu), 646 (B01, Thu)	Jin, Bing	1300 (H02, Mon)		
Jansone-Popova, Santa	1568 (I02, Wed)	Jin, Bong-Soo	414 (A03, Mon)	K	
Jaouen, Frederic	1488 (I02, Sun), 1492 (I02, Sun)	Jin, Changyong	588 (A06, Tue)	Kaare, Kätlin	1531 (I02, Tue)
Jaramillo, Thomas	1428 (I01, Wed), 1495 (I02, Sun), 1919 (L01, Wed)	Jin, Congrui	516 (A05, Sun)	Kabir, Sadia	1477 (I02, Sun), 1506 (I02, Mon)
Jaramillo, Thomas	929 (B08, Wed), 1380 (I01, Sun), 1749 (I05, Wed)	Jin, Dahee	214 (A02, Mon), 511 (A05, Sun)	Kabtam, Daniel	8 (A01, Sun)
Jarosova, Romana	1983 (L04, Tue)	Jin, Fei	797 (B05, Tue), 797 (B01-09, Tue)	Kadish, Karl	901 (B08, Tue), 951 (B08, Thu)
Jaroszeski, Mark	1855 (K01, Mon)	Jin, Junhong	1761 (I05, Wed)	Kaduk, James	336 (A02, Wed)
Jaśulaitienė, Vitalija	612 (B01-09, Tue), 612 (B01, Tue)	Jin, Kyoungsuk	1444 (I01, Wed)	Kaghazchi, Payam	1958 (L03, Tue)
Javey, Ali	1360 (H03, Tue)	Jin, Shijian	407 (A03, Mon)	Kaiser, Nahid	282 (A02, Tue)
Jawali, Puneet	1046 (D01, Wed)	Jin, Soo-Min	1166 (G01, Mon), 1169 (G01, Mon)	Kakadiaris, Eugenia	688 (B02, Thu)
Jaworski, Aleksander	1214 (G02, Tue)	Jin, Xinfang	1399 (I01, Mon)	Kakati, Nitul	1562 (I02, Wed)
Jayabal, Ezhilan	2099 (M03, Wed)	Jin, Yan	379 (A02, Thu)	Kakinuma, Katsuyoshi	1714 (I05, Tue)
Jayabal, Subramaniam	1392 (I01, Mon)	Jing, Yuhang	1388 (I01, Sun)	Kakireddy, Raghava	1046 (D01, Wed)
Jayathilake, Buddhinie	270 (A02, Tue), 408 (A03, Mon)	Jinks, Katherine	695 (B03, Mon)	Kaku, Hirokazu	401 (A03, Mon)
Jayawickramarajah, Janarthanan	941 (B08, Thu)	Jinno, Riena	1267 (H01, Mon)	Kakushima, Kuniyuki	77 (A01, Wed), 1181 (G01, Tue), 1294 (H01, Wed)
Jeerapan, Ithipon	2083 (M03, Wed)	Jinnouchi, Ryosuke	1806 (I06, Tue)	Kalamaras, Evangelos	1581 (I03, Sun)
Jeevarajan, Judith	583 (A06, Tue), 600 (A06, Wed)	Jo, Ara	2256 (Z03, Mon)	Kalami, Somayyeh	31 (A01, Mon)
Jeffrey Kuo, Chung-Feng	128 (A02, Sun)	Jo, Hyeong Ku	851 (B06, Tue), 851 (B01-09, Tue)	Kaland, Henning	125 (A02, Sun), 816 (B06, Mon)
Jehl, Zacharie	1230 (G02, Wed)	Jo, Jeongdai	620 (B01, Tue), 620 (B01-09, Tue)	Kalasina, Saran	493 (A04, Thu)
Jena, Debdeep	1267 (H01, Mon)	Jo, Yoon Ji	242 (A02, Mon)	Kalra, Vibha	114 (A02, Sun), 280 (A02, Tue), 503 (A04, Thu)
Jena, Prakrit	691 (B02, Thu), 721 (B03, Tue)	Johansen, Hans	1143 (F04, Wed)	Kalu, Egwu	59 (A01, Tue), 97 (A01, Thu), 1529 (I02, Tue), 1939 (L02, Tue)
Jensen, Grethe	20 (A01, Mon)	Johansson, Patrik	654 (B01, Thu)	Kamat, Prashant	1658 (I03, Thu)
Jensen, Lucas Frese Gronbech	1949 (L03, Mon)	Johnson, Ben	2224 (Z01, Tue)	Kamat, Vivek	2102 (M03, Wed), 2103 (M03, Wed)
Jeon, Dong Hyup	1144 (F04, Wed)	Johnson, Christopher	266 (A02, Tue)	Kameyama, Tatsuya	888 (B07, Tue)
Jeon, Hwan-Jin	239 (A02, Mon)	Johnson, Cody	1040 (D01, Tue)	Kamijo, Toshio	1097 (F01, Thu)
Jeon, Il	624 (B01, Wed), 626 (B01, Wed), 794 (B05, Tue)	Johnson, Dave	180 (A02, Mon)	Kamir, Yosef	486 (A04, Wed)
Jeon, Junha	679 (B02, Thu)	Johnson, Heidi	1285 (H01, Tue)	Kamitaka, Yuji	1806 (I06, Tue)
Jeon, Se-Hyeon	195 (A02, Mon), 196 (A02, Mon)	Johnson, Ian	386 (A02, Thu)	Kamphaus, Ethan	373 (A02, Thu)
Jeong, Goojin	206 (A02, Mon), 261 (A02, Tue)	Johnson, Justin	724 (B03, Tue), 872 (B07, Mon)	Kamyab, Niloofar	371 (A02, Thu)
Jeong, Goojin	206 (A02, Mon), 261 (A02, Tue)	Johnson, Nicholas	666 (B02, Wed)	Kanade, Chaitanya	80 (A01, Wed), 1381 (I01, Sun)
Jeong, Junseok	1292 (H01, Wed)	Johnson, Sarah	2167 (Z01, Tue)	Kanade, Vinit	80 (A01, Wed), 1381 (I01, Sun)
Jeong, Sanghwa	675 (B02, Thu)	Johs, Alexander	1870 (K02, Tue)	Kanamura, Kiyoshi	268 (A02, Tue), 388 (A02, Thu), 653 (B01, Thu)
Jeong, Yong-Cheol	1176 (G01, Mon)	Jones, Abby	1884 (K03, Wed), 2114 (M03, Thu)	Kanayama, Toshihiko	1184 (G01, Tue)
Jeong, Youngsoon	1471 (I01, Thu)	Jones, Allison	609 (B01, Tue), 609 (B01-09, Tue)	Kaneko, Yukihiro	148 (A02, Mon), 285 (A02, Tue)
Jervis, Rhodri	512 (A05, Sun)	Jones, Deborah	1492 (I02, Sun)	Kanematsu, Hideyuki	671 (B02, Wed), 1097 (F01, Thu), 1869 (K02, Tue)
Jheng, Jhu-Siang	1340 (H02, Wed)	Jones, Deborah	1975 (L04, Tue), 1986 (L04, Tue)	Kang, Donghyeon	332 (A02, Wed)
Jhong, Huan-Ping	2115 (M03, Thu)	Jones, Kevin	1273 (H01, Tue), 1775 (I05, Thu)	Kang, Eun Heui	1760 (I05, Wed)
Ji, Yunlong	407 (A03, Mon)	Jones, Paige	2153 (Z01, Tue)	Kang, Han Sol	2176 (Z01, Tue)
Jia, Hongxing	795 (B05, Tue)	Joo, Sang Hoon	924 (B08, Wed)	Kang, Hyun Suk	627 (B01, Wed), 724 (B03, Tue)
Jia, Lichao	33 (A01, Mon)	Joo, Yong	113 (A02, Sun)	Kang, In Ho	1266 (H01, Mon)
Jia, Qingying	640 (B01, Wed), 1402 (I01, Mon)	Joos, Nathaniel	409 (A03, Mon)	Kang, Jaewook	1088 (F01, Wed)
Jia, Qingying	1384 (I01, Sun), 1394 (I01, Mon), 1485 (I02, Sun)	Joplin, Anneli	1912 (L01, Tue)	Kang, Jeung Ku	326 (A02, Wed), 632 (B01, Wed)
Jia, Yibo	996 (C01, Tue), 997 (C01, Tue), 1022 (C01, Wed)	Josell, Daniel	1051 (E01, Wed), 1057 (E01, Wed), 1059 (E01, Wed), 1123 (F04, Tue)	Kang, Sung	202 (A02, Mon)
Jia, Yikai	591 (A06, Tue)	Joshi, Jarina	1865 (K02, Tue)	Kang, Zhenye	1437 (I01, Wed)
Jia, Yueju	271 (A02, Tue)	Joshi, Prema	1432 (I01, Wed)		
Jiang, Changle	83 (A01, Wed)	Joshi-Imre, Alexandra	2160 (Z01, Tue)		
Jiang, Chunsheng	305 (A02, Wed)	Joshi-Imre, Alexandra	1208 (G02, Tue), 1848 (K01, Mon)		

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Kannan, Dhevathi	1939 (L02, Tue)	Kendrick, Ian	1461 (I01, Thu), 1502 (I02, Mon), 1818 (I06, Wed)	Kim, Eom-Ji	1433 (I01, Wed)
Kannan, Dhevathi	97 (A01, Thu)	Kenis, Paul	897 (B07, Tue), 1070 (F01, Wed), 1587 (I03, Sun), 1624 (I03, Tue)	Kim, Hacksung	1660 (I03, Thu)
Kannan, Vishvak	1151 (F04, Wed)	Kennell, Glyn	1966 (L03, Tue)	Kim, Hackyoung	881 (B07, Tue), 960 (B09, Wed), 2212 (Z01, Tue)
Kanno, Isaku	2230 (Z01, Tue)	Kennemur, Justin	1571 (I02, Thu)	Kim, Hansu	205 (A02, Mon), 206 (A02, Mon), 207 (A02, Mon), 255 (A02, Tue), 261 (A02, Tue)
Kanomata, Kensaku	2181 (Z01, Tue)	Kercher, Andrew	147 (A02, Mon)	Kim, Harrison	1188 (G01, Tue)
Kao-Ian, Wathanyu	66 (A01, Tue)	Kercher, Andrew	314 (A02, Wed), 316 (A02, Wed)	Kim, Hea-Jee	1166 (G01, Mon), 1169 (G01, Mon)
Karahan, Billur	320 (A02, Wed), 327 (A02, Wed)	Kern, Neil	1104 (F03, Tue)	Kim, Hee Min	225 (A02, Mon)
Karaiskakis, Alexandros	1582 (I03, Sun)	Kerr, Emily	407 (A03, Mon)	Kim, Ho Hyeon	1178 (G01, Mon)
Karajic, Aleksandar	1679 (I04, Tue)	Keyser, Matthew	576 (A06, Tue), 1136 (F04, Wed)	Kim, Ho-Sung	195 (A02, Mon), 196 (A02, Mon)
Karakaya, Ishak	1071 (F01, Wed)	Khakpour, Iman	304 (A02, Wed), 656 (B01, Thu), 807 (B06, Sun)	Kim, Hui-Hun	462 (A04, Wed)
Karaoglu, Gozde	60 (A01, Tue)	Khalakhan, Ivan	1447 (I01, Wed)	Kim, Hun	221 (A02, Mon)
Karaseva, Elena	236 (A02, Mon), 238 (A02, Mon)	Khaleed, Abubakar	614 (B01-09, Tue)	Kim, Hyeong-U	1381 (I01, Sun)
Kariuki, Nancy	554 (A05, Tue), 1460 (I01, Thu), 1490 (I02, Sun), 1491 (I02, Sun), 1499 (I02, Mon), 1500 (I02, Mon), 1564 (I02, Wed), 1565 (I02, Wed)	Khaleghi Rahimian, Saeed	394 (A02, Thu), 597 (A06, Wed)	Kim, Hyoung Woo	1266 (H01, Mon)
Karkamkar, Abhijeet	1625 (I03, Tue)	Khamitov, Edward	1950 (L03, Mon), 1951 (L03, Mon)	Kim, Hyoung-Juhn	1478 (I02, Sun)
Karpushkin, Evgeny	415 (A03, Mon)	Khan, Asif	1164 (G01, Mon)	Kim, HyoWon	1456 (I01, Wed)
Karr, Paul	912 (B08, Tue), 912 (B01-09, Tue)	Khan, Foysal	2226 (Z01, Tue)	Kim, Hyun	811 (B06, Sun)
Karulkar, Mohan	23 (A01, Mon), 47 (A01, Tue), 577 (A06, Tue)	Khan, Niazul	2089 (M03, Wed)	Kim, Hyun You	1393 (I01, Mon)
Karunarathne, Darshan	1016 (C01, Tue)	Khan, Tamal T.	232 (A02, Mon)	Kim, Hyun-Soo	414 (A03, Mon)
Karuturi, Siva	1706 (I05, Mon)	Khandavalli, Sunilkumar	1506 (I02, Mon)	Kim, Hyungjun	2127 (Z01, Tue), 2128 (Z01, Tue)
Kasai, Shigenobu	1845 (K01, Mon), 1846 (K01, Mon), 1853 (K01, Mon)	Khani, Hadi	31 (A01, Mon), 178 (A02, Mon), 1425 (I01, Tue)	Kim, Hyunjin	344 (A02, Thu)
Kasai, Shigenobu	1854 (K01, Mon)	Khanna, Aniruddh	1046 (D01, Wed)	Kim, Icpyo	462 (A04, Wed)
Kasani, Sujan	2091 (M03, Wed)	Kharbachi, Chams	1061 (E01, Wed)	Kim, Ja Yeon	1285 (H01, Tue)
Kasemchainan, Jitti	558 (A05, Tue)	Kharwar, Yashwant	1747 (I05, Wed)	Kim, Jae Keon	2041 (M01, Wed)
Kashanian, Faezeh	961 (B09, Wed)	Kheawhom, Soorathep	4 (A01, Sun), 5 (A01, Sun), 66 (A01, Tue)	Kim, Jae Keon	734 (B03, Tue), 734 (B01-09, Tue), 735 (B03, Tue), 735 (B01-09, Tue)
Kashyap, Diwakar	1528 (I02, Tue)	Khinevich, Nadia	1349 (H02, Wed)	Kim, Jae-Hyung	223 (A02, Mon)
Kashyap, Jatin	806 (B06, Sun)	Khoo, Edwin	1140 (F04, Wed)	Kim, Jaehoon	1657 (I03, Thu)
Kashyap, Varchaswal	1735 (I05, Wed)	Khosla, Ajit	2123 (M03, Thu)	Kim, JaeKeon	730 (B01-09, Tue), 730 (B03, Tue)
Kasian, Olga	1410 (I01, Tue), 1442 (I01, Wed)	Khuat, Binh Hoang	548 (A05, Mon)	Kim, Jaewon	1085 (F01, Wed)
Kasperski, Anne	1021 (C01, Wed)	Khusnutdinova, Diana	931 (B08, Wed), 1638 (I03, Tue)	Kim, Je-Deok	1567 (I02, Wed), 1577 (I02, Thu)
Kassie Birhanu, Mulatu	1090 (F01, Thu)	Khyzhun, Oleg	42 (A01, Mon)	Kim, Jeom-Soo	309 (A02, Wed)
Katakura, Katsumi	671 (B02, Wed), 1869 (K02, Tue)	Ki, Hyeong-Seo	230 (A02, Mon)	Kim, Jeong Eun	2241 (Z02, Mon)
Kataura, Hiromichi	745 (B03, Wed)	Kibsgaard, Jakob	1404 (I01, Mon)	Kim, Ji-Yeon	1166 (G01, Mon), 1169 (G01, Mon)
Katayama, Yasushi	265 (A02, Tue)	Kiely, Christopher	1711 (I05, Mon)	Kim, Jihyun	811 (B06, Sun), 1266 (H01, Mon), 1291 (H01, Wed)
Kato, Masaru	885 (B07, Tue), 1916 (L01, Wed)	Kiessling, Aleksandr	1479 (I02, Sun)	Kim, Jinyoung	208 (A02, Mon)
Kato, Tatsuhisa	938 (B08, Wed)	Kilani, Mohamed	2077 (M03, Tue)	Kim, Jiyong	237 (A02, Mon)
Kato, Tomohisa	1043 (D01, Wed)	Kim, Ayoung	206 (A02, Mon), 261 (A02, Tue)	Kim, Jiyong	1188 (G01, Tue)
Kato, Tomonori	2247 (Z02, Mon)	Kim, Baek Su	1178 (G01, Mon)	Kim, Jong Hwa	2130 (Z01, Tue)
Kato, Yuichiro	741 (B03, Wed)	Kim, Bum Yong	1178 (G01, Mon)	Kim, Jong Min	289 (A02, Tue)
Kato, Yuichiro	744 (B03, Wed)	Kim, Chang-Hyun	1236 (G03, Tue)	Kim, Jongryoul	1231 (G02, Wed)
Katogi, Akihiro	120 (A02, Sun)	Kim, Changhyeon	462 (A04, Wed)	Kim, Jongsik	1987 (L04, Tue)
Katsiev, Khabiboulakh	1229 (G02, Wed)	Kim, Chisu	1766 (I05, Thu)	Kim, Jongsoon	465 (A04, Wed), 466 (A04, Wed)
Kauffman, Douglas	1996 (L04, Wed)	Kim, ChulOong	1837 (K01, Mon), 2206 (Z01, Tue)	Kim, Joo Sung	1316 (H02, Mon)
Kauffman, Brice	954 (B08, Thu)	Kim, Da Bin	812 (B06, Sun), 2007 (M01, Tue)	Kim, Ju Young	210 (A02, Mon)
Kauppinen, Esko	626 (B01, Wed), 794 (B05, Tue)	Kim, Da-Hye	195 (A02, Mon)	Kim, Jung Myung	1754 (I05, Wed)
Kaur, Aman	266 (A02, Tue)	Kim, Dae Kyom	30 (A01, Mon)	Kim, Jungho	1660 (I03, Thu)
Kavan, Ladislav	862 (B07, Sun)	Kim, Dae-Hyeong	1376 (H03, Wed)	Kim, Kang Lib	2176 (Z01, Tue), 2184 (Z01, Tue), 2235 (Z01, Tue)
Kawaguchi, Kenji	1421 (I01, Tue)	Kim, Do Hwan	1343 (H02, Wed)	Kim, Keum Do	1178 (G01, Mon)
Kawaguchi, Tomoya	1887 (L01, Mon)	Kim, Do Hwan	1316 (H02, Mon)	Kim, Ki Hyun	1732 (I05, Wed), 1750 (I05, Wed)
Kawai, Takeshi	2269 (Z03, Mon)	Kim, Do Hwan	1311 (H02, Mon)	Kim, Ki-Joong	2024 (M01, Wed), 2028 (M01, Wed)
Kawakami, Masaru	2123 (M03, Thu)	Kim, Do Hyung	2201 (Z01, Tue)	Kim, Kwang Man	210 (A02, Mon)
Kawanago, Takamasa	823 (B06, Mon)	Kim, Dohwan	214 (A02, Mon)	Kim, Kyuman	228 (A02, Mon)
Kawaoka, Shuhei	889 (B07, Tue)	Kim, Don-Won	491 (A04, Wed)	Kim, Mankyung	1282 (H01, Tue)
Kawde, Abdelnasser	1922 (L01, Wed)	Kim, Dong Shik	2049 (M01, Wed)	Kim, Matthew	535 (A05, Mon)
Kazanowska, Barbara	1273 (H01, Tue)	Kim, Dong Sung	1331 (H02, Tue)	Kim, Mi So	1440 (I01, Wed)
Ke, Xinyou	1077 (F01, Wed)	Kim, Dong-Hyung	6 (A01, Sun), 35 (A01, Mon), 2198 (Z01, Tue)	Kim, Mijin	733 (B03, Tue), 733 (B01-09, Tue)
Keck, Devin	2153 (Z01, Tue)	Kim, Dong-Joo	2047 (M01, Wed), 2048 (M01, Wed), 2075 (M03, Tue)	Kim, Mijin	714 (B03, Tue)
Kékedy-Nagy, László	2242 (Z02, Mon)	Kim, Dong-Won	191 (A02, Mon), 192 (A02, Mon), 193 (A02, Mon)	Kim, Min Woo	1754 (I05, Wed)
Keleher, Jason	1036 (D01, Tue), 1856 (K01, Mon), 2156 (Z01, Tue), 2161 (Z01, Tue), 2162 (Z01, Tue), 2163 (Z01, Tue), 2194 (Z01, Tue), 2215 (Z01, Tue), 2225 (Z01, Tue), 2233 (Z01, Tue)	Kim, Dong-Won	1166 (G01, Mon), 1169 (G01, Mon)	Kim, Min-Young	195 (A02, Mon), 196 (A02, Mon)
Keles, Ozgul	320 (A02, Wed)	Kim, Donghyuk	65 (A01, Tue)	Kim, Mokwon	344 (A02, Thu)
Kelly, James	1055 (E01, Wed)	Kim, Doo Young	1591 (I03, Sun)	Kim, Myung Jun	1109 (F03, Tue), 1379 (I01, Sun)
Kelly, John	1227 (G02, Wed)			Kim, Patrick	16 (A01, Mon)
Kelly, Maria	420 (A03, Tue)			Kim, Rosa	1231 (G02, Wed)
Kenppainen, Erno	1636 (I03, Tue)			Kim, Samhwan	734 (B03, Tue), 734 (B01-09, Tue)
Kendrick, Aaron	1571 (I02, Thu)			Kim, Sang Hoon	1987 (L04, Tue)
				Kim, Sang-Min	65 (A01, Tue)

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Kim, Seo-Yun.....	882 (B07, Tue)	Knudsen, Kristian	347 (A02, Thu), 1936 (L02, Tue), 1937 (L02, Tue)	Korzeniewski, Carol	813 (B06, Mon), 1573 (I02, Thu), 1905 (L01, Tue), 1918 (L01, Wed)
Kim, Seon Il	1835 (K01, Mon)	Ko, Hyunhyub.....	1356 (H03, Tue)	Kosasang, Soracha.....	275 (A02, Tue), 385 (A02, Thu)
Kim, Seung Wan.....	173 (A02, Mon)	Ko, Jesse.....	496 (A04, Thu)	Kosmala, Tomasz.....	1492 (I02, Sun)
Kim, So Young.....	1311 (H02, Mon), 1316 (H02, Mon)	Ko, Jesse.....	383 (A02, Thu), 1769 (I05, Thu), 2147 (Z01, Tue)	Kostecki, Robert	524 (A05, Sun)
Kim, Soo-Kil.....	1051 (E01, Wed)	Ko, Jonathan.....	212 (A02, Mon), 338 (A02, Wed)	Kosto, Yuliia.....	1447 (I01, Wed)
Kim, Soohwan.....	205 (A02, Mon), 207 (A02, Mon)	Ko, Tae Ho.....	1732 (I05, Wed), 1750 (I05, Wed)	Kotani, Hiroaki.....	902 (B08, Tue)
Kim, Soojeong.....	386 (A02, Thu)	Ko, Wonseok.....	465 (A04, Wed), 466 (A04, Wed)	Kotula, Paul.....	1699 (I05, Mon)
Kim, Steve.....	1370 (H03, Wed)	Kobayashi, Shun.....	1798 (I06, Tue)	Kovtun, Yuriy.....	944 (B08, Thu)
Kim, Suncheul.....	1179 (G01, Mon)	Kobayashi, Takeshi.....	501 (A04, Thu)	Kowalik, Remigiusz.....	1387 (I01, Sun), 1413 (I01, Tue), 2174 (Z01, Tue)
Kim, Sung Jin.....	1469 (I01, Thu)	Kobayashi, Wataru.....	2149 (Z01, Tue)	Kramer, Dominik.....	253 (A02, Tue)
Kim, Sungjun.....	1503 (I02, Mon)	Kobori, Yasuhiro.....	854 (B07, Sun), 889 (B07, Tue)	Kramm, Ulrike.....	1757 (I05, Wed)
Kim, Sungjun.....	1168 (G01, Mon)	Kodama, Kensaku.....	1806 (I06, Tue)	Krause, Colleen.....	2114 (M03, Thu)
Kim, Taesung.....	80 (A01, Wed), 1037 (D01, Tue), 1045 (D01, Wed), 1381 (I01, Sun)	Kodithuwakku, Udari.....	1591 (I03, Sun)	Krause, Frederick.....	177 (A02, Mon)
Kim, Taeyul.....	2195 (Z01, Tue)	Koduru, Mallikarjuna.....	2212 (Z01, Tue)	Krbal, Milos.....	837 (B06, Tue), 2060 (M02, Wed)
Kim, Un-Hyuck.....	223 (A02, Mon)	Koech, Philemon.....	1218 (G02, Tue), 2177 (Z01, Tue)	Kreder, Karl.....	249 (A02, Tue)
Kim, Wan-Bae.....	2169 (Z01, Tue)	Koech, Philemon K.....	2178 (Z01, Tue), 2183 (Z01, Tue)	Kreider, Melissa.....	1749 (I05, Wed)
Kim, Won Bae.....	218 (A02, Mon), 1751 (I05, Wed)	Koehler, Andrew.....	1274 (H01, Tue)	Kreider, Melissa.....	1495 (I02, Sun)
Kim, Woochul.....	1307 (H02, Mon)	Koehne, Jessica.....	2087 (M03, Wed)	Kreka, Kosova.....	1701 (I05, Mon)
Kim, Yeeun.....	2133 (Z01, Tue)	Koenig, Gary.....	180 (A02, Mon), 241 (A02, Mon), 331 (A02, Wed), 485 (A04, Wed), 519 (A05, Sun)	Kreller, Courtney.....	1678 (I04, Tue)
Kim, Yekyu.....	218 (A02, Mon)	Koenig, Ryan.....	783 (B05, Mon), 784 (B05, Mon), 798 (B01-09, Tue), 798 (B05, Tue)	Kremer, Lea.....	181 (A02, Mon)
Kim, Yong Jae.....	1835 (K01, Mon)	Kogo, Takeshi.....	671 (B02, Wed), 1097 (F01, Thu), 1869 (K02, Tue)	Kreuer, Klaus-Dieter.....	1787 (I06, Mon)
Kim, Yong-Chan.....	2131 (Z01, Tue)	Koh, Andrew.....	2094 (M03, Wed)	Krewer, Ulrike.....	367 (A02, Thu)
Kim, Yongchan.....	1311 (H02, Mon)	Koh, Katherine.....	1625 (I03, Tue)	Krishna, B. Murali.....	1409 (I01, Tue)
Kim, Yoong-Ahm.....	196 (A02, Mon)	Kohl, Paul.....	1733 (I05, Wed)	Krishna, Lakshmi.....	1120 (F03, Tue)
Kim, Yoongon.....	218 (A02, Mon), 1751 (I05, Wed)	Kojima, Takahiko.....	902 (B08, Tue)	Krishnamurthy, Balaji.....	1543 (I02, Wed)
Kim, Youjung.....	1056 (E01, Wed), 1231 (G02, Wed)	Kolagatla, Srikanth.....	2260 (Z03, Mon)	Krishnan, Mahadevaiyer.....	58 (A01, Tue)
Kim, Young-Jun.....	261 (A02, Tue), 491 (A04, Wed), 2132 (Z01, Tue)	Kolbasov, Genadii.....	42 (A01, Mon)	Krishnan, Sadagopan.....	1839 (K01, Mon), 1868 (K02, Tue), 1874 (K03, Wed), 1882 (K03, Wed), 2095 (M03, Wed)
Kim, Younghee.....	745 (B03, Wed)	Kolbasov, Gennadii.....	802 (B06, Sun)	Kristianto, Hans.....	650 (B01, Thu)
Kim, Yousoo.....	741 (B03, Wed)	Kolberg, Alex.....	1216 (G02, Tue)	Krittayavathananon, Atiweena.....	274 (A02, Tue), 493 (A04, Thu), 494 (A04, Thu), 532 (A05, Mon), 615 (B01-09, Tue), 615 (B01, Tue)
Kim, Yu Seung.....	448 (A03, Wed), 1406 (I01, Tue), 1475 (I02, Sun), 1574 (I02, Thu), 1575 (I02, Thu), 1678 (I04, Tue)	Kolczyk, Karolina.....	1387 (I01, Sun), 1413 (I01, Tue), 2174 (Z01, Tue)	Kronik, Leeor.....	950 (B08, Thu)
Kim, Yun Kon.....	2152 (Z01, Tue)	Kole, Subarna.....	1828 (I06, Wed)	Kropf, A. Jeremy.....	1485 (I02, Sun), 1500 (I02, Mon)
Kimball, Jonathan.....	1161 (F04, Thu)	Kolek, Martin.....	165 (A02, Mon)	Kruk, Robert.....	62 (A01, Tue)
Kimmel, Samuel.....	2147 (Z01, Tue)	Kolkhekar, Snehal.....	61 (A01, Tue)	Kruss, Sebastian.....	681 (B02, Thu), 722 (B03, Tue)
Kimura, Kensuke.....	741 (B03, Wed)	Kolla, Praveen.....	1586 (I03, Sun), 1592 (I03, Sun)	Krutko, Oleksiy.....	1258 (G03, Wed)
King, David.....	311 (A02, Wed)	Kolluri, Suryanarayana.....	106 (A01, Thu), 1129 (F04, Tue), 1153 (F04, Thu), 1156 (F04, Thu), 1157 (F04, Thu), 1159 (F04, Thu)	Kruusenberg, Ivar.....	1531 (I02, Tue)
King, Laurie.....	929 (B08, Wed), 1380 (I01, Sun)	Kolosnitsyn, Dmitrii.....	238 (A02, Mon)	Kuan, Chieh-Hsiung.....	1283 (H01, Tue), 1286 (H01, Tue)
King, Laurie.....	1428 (I01, Wed), 1495 (I02, Sun)	Kolosnitsyn, Vladimir.....	236 (A02, Mon), 238 (A02, Mon), 1950 (L03, Mon), 1951 (L03, Mon)	Kub, Fritz.....	1274 (H01, Tue)
King, Laurie.....	1749 (I05, Wed)	Komaba, Shinichi.....	15 (A01, Mon), 120 (A02, Sun), 143 (A02, Sun), 235 (A02, Mon)	Kubal, Joseph.....	1498 (I02, Mon)
King, Sean.....	1185 (G01, Tue), 1187 (G01, Tue)	Komanicky, Vladimir.....	1887 (L01, Mon)	Kübler, Markus.....	1757 (I05, Wed)
Kinloch, Ian.....	831 (B06, Tue)	Komarov, Pavel.....	1269 (H01, Mon)	Kubo, Yoshimi.....	209 (A02, Mon), 352 (A02, Thu)
Kinnamon, David.....	2080 (M03, Tue)	Komayko, Alena.....	415 (A03, Mon)	Kubota, Kei.....	15 (A01, Mon), 120 (A02, Sun), 143 (A02, Sun), 235 (A02, Mon)
Kinsler, Dacen.....	1902 (L01, Tue)	Komini Babu, Siddharth.....	1489 (I02, Sun), 1499 (I02, Mon), 1678 (I04, Tue)	Kubota, Masaaki.....	268 (A02, Tue), 653 (B01, Thu)
Kinyon, S.....	583 (A06, Tue)	Konarov, Aishuak.....	118 (A02, Sun)	Kucernak, Anthony.....	1492 (I02, Sun)
Kippelen, Bernard.....	1246 (G03, Wed)	Kondo, Kei.....	1170 (G01, Mon)	Kucuk, Kamil.....	1472 (I01, Thu)
Kiran Kumar, V.....	141 (A02, Sun)	Kondo, Toshiaki.....	895 (B07, Tue)	Kudo, Tetsuichi.....	1890 (L01, Mon)
Kirchner, Silke.....	1912 (L01, Tue)	Kondo, Toshihiro.....	325 (A02, Wed)	Kukreja, Ratandeep.....	1504 (I02, Mon)
Kireev, Dmitry.....	1296 (H02, Mon)	Konduru, Vinaykumar.....	1533 (I02, Wed)	Kulesza, Pawel.....	1650 (I03, Thu), 1970 (L04, Mon), 1973 (L04, Mon), 1979 (L04, Tue), 2055 (M02, Wed)
Kirk, Donald.....	1510 (I02, Tue)	Kondusamy, Aswin.....	1188 (G01, Tue)	Kumagai, Masashi.....	1846 (K01, Mon)
Kirner, Joel.....	646 (B01, Thu)	Kong, Shuying.....	41 (A01, Mon)	Kumagai, Ryoma.....	1846 (K01, Mon)
Kishi, Marino.....	888 (B07, Tue)	Kongkanand, Anusorn.....	1504 (I02, Mon), 1817 (I06, Wed)	Kumagai, Yoshinao.....	1262 (H01, Mon)
Kissel, Daniel.....	1856 (K01, Mon), 2196 (Z01, Tue)	Konno, Yoshiki.....	2253 (Z02, Mon)	Kumar, Ankita.....	75 (A01, Wed)
Kistler, Tobias.....	1637 (I03, Tue)	Koo, Boram.....	37 (A01, Mon), 38 (A01, Mon)	Kumar, Praveen.....	2032 (M01, Wed)
Kitajou, Ayuko.....	2149 (Z01, Tue)	Koo, Yoonbon.....	1179 (G01, Mon)	Kumar, Pushendra.....	227 (A02, Mon)
Kitayev, Anna.....	1829 (I06, Wed), 1830 (I06, Wed)	Koomson, Samuel.....	1692 (I04, Tue)	Kumar, Sandeep.....	909 (B01-09, Tue), 909 (B08, Tue)
Kitt, Jay.....	1905 (L01, Tue)	Kopjar, Dennis.....	1647 (I03, Wed)	Kumar, Siddhartha.....	2216 (Z01, Tue)
Klauk, Hagen.....	1238 (G03, Tue)	Korgel, Brian.....	871 (B07, Mon)	Kumar Rai, Sujeet.....	1351 (H02, Wed)
Klavetter, Kyle.....	2008 (M01, Tue)	Kormányos, Attila.....	1661 (I03, Thu)	Kumaraguru, Swami.....	1481 (I02, Sun), 1533 (I02, Wed)
Kleemann, Hans.....	1255 (G03, Wed)	Kornbluth, Mordechai.....	147 (A02, Mon)	Kumatani, Akichika.....	2267 (Z03, Mon)
Kleen, Gregory.....	1820 (I06, Wed)			Kumatani, Akichika.....	2259 (Z03, Mon)
Klein, Ellis.....	1512 (I02, Tue), 1540 (I02, Wed), 1569 (I02, Thu), 1651 (I03, Thu)			Kumberg, Jana.....	181 (A02, Mon)
Klein, Emily.....	578 (A06, Tue)				
Klemm, Elias.....	1647 (I03, Wed)				
Klinkert, Cedric.....	1182 (G01, Tue)				
Kloes, Alexander.....	1238 (G03, Tue)				
Klychnikova, Elena.....	1850 (K01, Mon)				
Kment, Štěpán.....	1607 (I03, Mon), 1667 (I03, Thu)				
Knights, Shanna.....	1552 (I02, Wed)				
Knipe, Jennifer.....	1066 (F01, Wed)				

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Kumbhar, Pramod	102 (A01, Thu)	Lamb, Joshua	23 (A01, Mon), 47 (A01, Tue), 454 (A03, Wed), 569 (A06, Mon), 577 (A06, Tue)	Lee, Dong Joon	344 (A02, Thu)
Kumta, Prashant	17 (A01, Mon), 48 (A01, Tue), 50 (A01, Tue), 1434 (I01, Wed)	Lambert, Alexander	977 (C01, Mon), 978 (C01, Mon), 2166 (Z01, Tue)	Lee, Dong Kyu	239 (A02, Mon)
Kunimoto, Masahiro	1127 (F04, Tue)	Lambert, Benjamin	690 (B02, Thu), 720 (B03, Tue), 728 (B01-09, Tue), 728 (B03, Tue), 729 (B03, Tue), 729 (B01-09, Tue)	Lee, Dong-Chan	1929 (L01, Wed)
Kuno, Masaru	870 (B07, Mon)	Lamy, Claude	1439 (I01, Wed)	Lee, Dongcheul	38 (A01, Mon)
Kuo, Ding-Yuan	1707 (I05, Mon)	Landers, Robert	434 (A03, Tue)	Lee, Dongryul	1291 (H01, Wed)
Kuo, Mei-Chen	1974 (L04, Tue)	Landers, Robert	1161 (F04, Thu)	Lee, Doohee	2047 (M01, Wed), 2048 (M01, Wed), 2075 (M03, Tue)
Kuo, Wen-Che	1299 (A02, Mon), 1309 (H02, Mon)	Landes, Christy	873 (B07, Mon), 875 (B07, Mon), 1912 (L01, Tue), 1926 (L01, Wed)	Lee, Eun Ae	2201 (Z01, Tue)
Kuo, Yue	1189 (G01, Tue), 1194 (G01, Wed)	Landon, James	457 (A03, Wed), 1104 (F03, Tue)	Lee, Eungie	599 (A06, Wed)
Kupis-Rozmyslowicz, Justyna	660 (B02, Tue), 660 (B01-09, Tue)	Landry, Markita	675 (B02, Thu), 683 (B02, Thu)	Lee, Eunji	2047 (M01, Wed), 2048 (M01, Wed), 2075 (M03, Tue)
Kuramata, Akito	1261 (H01, Mon), 1264 (H01, Mon), 1269 (H01, Mon)	Lang, Christopher	286 (A02, Tue), 342 (A02, Wed)	Lee, Gil	731 (B03, Tue), 731 (B01-09, Tue), 1519 (I02, Tue)
Kurashina, Masashi	2115 (M03, Thu)	Langa, Fernando	778 (B05, Mon), 922 (B08, Wed)	Lee, Gwangwon	1035 (D01, Tue)
Kure-Chu, Song-Zhu	355 (A02, Thu), 1064 (E01, Wed)	Lange, Heather	2233 (Z01, Tue)	Lee, Hee-Yeol	333 (A02, Wed)
Kurkowski, Michael	1827 (I06, Wed)	Langenbacher, Rachel	721 (B03, Tue)	Lee, Heung Chan	344 (A02, Thu)
Kurniawan, Cepi	2064 (M02, Wed)	Langendorf, Jill	551 (A05, Tue), 569 (A06, Mon)	Lee, Hojin	2164 (Z01, Tue)
Kuroda, Daisuke	671 (B02, Wed), 1097 (F01, Thu), 1869 (K02, Tue)	Langhorst, Lisa	1811 (I06, Tue)	Lee, Howard	1080 (F01, Wed)
Kuroda, Kensuke	1088 (F01, Wed)	Langlois, David	1805 (I06, Tue)	Lee, Hyeokjung	2176 (Z01, Tue), 2235 (Z01, Tue)
Kuroda, Rihito	1228 (G02, Wed)	Lanzillo, Nicholas	1048 (E01, Wed)	Lee, Hyungdong	228 (A01, Mon)
Kuroda, Yoshiyuki	1505 (I02, Mon)	Laraia, Vince	1047 (D01, Wed)	Lee, Hyunpyo	344 (A02, Thu)
Kuroda, Yoshiyuki	1423 (I01, Tue)	LaRochelle Richard, Lynne	640 (B01, Wed)	Lee, Inyoung	2227 (Z01, Tue)
Kurohagi, Masayuki	2230 (Z01, Tue)	Larrain, Felipe	1246 (G03, Wed)	Lee, Jack	825 (B06, Mon), 1168 (G01, Mon)
Kurokawa, Hiromi	943 (B08, Thu)	Larrazabal, Gaston	1069 (F01, Wed)	Lee, Jae	323 (A02, Wed), 2133 (Z01, Tue), 2152 (Z01, Tue), 2197 (Z01, Tue)
Kurra, Narendra	815 (B06, Mon)	Larsen, Ross	1441 (I01, Wed)	Lee, Jae Chun	2195 (Z01, Tue)
Kurungot, Sreekumar	1735 (I05, Wed)	Larson, David	1637 (I03, Tue)	Lee, Jae-Eon	1284 (H01, Tue)
Kúš, Peter	1447 (I01, Wed)	Lashmore, David	965 (B09, Wed)	Lee, Jae-Hyun	1381 (I01, Sun)
Kusama, Tomoe	172 (A02, Mon)	Laskowski, Carl	1827 (I06, Wed)	Lee, Jae-Joon	76 (A01, Wed), 1779 (I05, Thu)
Kusano, Tomohiro	1038 (D01, Tue)	Latini, Andrea	728 (B01-09, Tue), 728 (B03, Tue)	Lee, Jaehyun	28 (A01, Mon)
Kusoglu, Ahmet	1744 (I05, Wed)	Latini, Andrea	728 (B01-09, Tue), 728 (B03, Tue)	Lee, Jaewoo	38 (A01, Mon)
Kuss, Sabine	1843 (K01, Mon)	Laturia, Akash	1192 (G01, Wed)	Lee, Jason	1741 (I05, Wed)
Kusumoto, Takayoshi	2145 (Z01, Tue)	Lau, Derwin	283 (A02, Tue)	Lee, Ji-Eun	882 (B07, Tue)
Kutyla, Dawid	1387 (I01, Sun), 1413 (I01, Tue), 2174 (Z01, Tue)	Lau, Grace	11 (A01, Sun)	Lee, Jinhyun	1056 (E01, Wed), 1231 (G02, Wed)
Kuwabata, Susumu	888 (B07, Tue)	Laugier, Christelle	1253 (G03, Wed)	Lee, Jinwoo	637 (B01, Wed)
Kuzmany, Hans	716 (B03, Tue)	Lauret, Jean-Sébastien	719 (B03, Tue), 743 (B03, Wed)	Lee, Jiwan	206 (A02, Mon), 261 (A02, Tue)
Kuzmina, Elena	238 (A02, Mon), 1950 (L03, Mon), 1951 (L03, Mon)	Lavarda, Giulia	933 (B08, Wed)	Lee, Jon Ju	201 (A02, Mon)
Kuznetsov, Oleg	396 (A02, Thu)	Lavie, Julien	719 (B03, Tue)	Lee, Jong Dae	242 (A02, Mon)
Kuzum, Duygu	829 (B06, Mon)	Lawson, John	347 (A02, Thu), 348 (A02, Thu), 1961 (L03, Tue)	Lee, Jong-Hyeon	2169 (Z01, Tue)
Kwabi, David	407 (A03, Mon)	Laycock, Nick	1024 (C01, Wed)	Lee, Jong-Hyeon	2158 (Z01, Tue), 2182 (Z01, Tue)
Kwiecińska, Anna	1387 (I01, Sun), 2174 (Z01, Tue)	Lazerges, Mathieu	2125 (M03, Thu)	Lee, Jong-Hyeon	2175 (Z01, Tue)
Kwon, Gihan	1660 (I03, Thu)	Le, Hy	1207 (G02, Tue), 2221 (Z01, Tue)	Lee, Jong-Hyeon	2157 (Z01, Tue), 2168 (Z01, Tue)
Kwon, Hyuk Jae	344 (A02, Thu)	Le, Nguyen	1350 (H02, Wed)	Lee, Jong-Sook	1444 (I01, Wed)
Kwon, HyukSang	1456 (I01, Wed)	Le Fevre, Lewis	86 (A01, Wed)	Lee, Jong-Won	215 (A02, Mon), 219 (A02, Mon)
Kwon, Ki-Hyun	1166 (G01, Mon), 1169 (G01, Mon)	Le Royer, Cyrille	1198 (G01, Wed)	Lee, Joong Kee	650 (B01, Thu)
Kwon, Min-Ki	1285 (H01, Tue)	Leach, Andrew	512 (A05, Sun)	Lee, Ju Sung	1478 (I02, Sun)
Kwon, Suk-Cheol	2157 (Z01, Tue), 2168 (Z01, Tue)	Leach, J.	1265 (H01, Mon)	Lee, Jung-Ho	6 (A01, Sun), 35 (A01, Mon), 2198 (Z01, Tue)
Kwon, Suk-Cheol	2158 (Z01, Tue), 2169 (Z01, Tue)	Lebedev, Dmitry	1405 (I01, Mon)	Lee, Jung-Hun	2132 (Z01, Tue)
Kwon, Yong Il	1179 (G01, Mon)	Lebedev, Mikhail	1207 (G02, Tue), 2221 (Z01, Tue)	Lee, Junyeop	730 (B03, Tue), 730 (B01-09, Tue), 734 (B03, Tue), 734 (B01-09, Tue), 735 (B03, Tue), 735 (B01-09, Tue), 2041 (M01, Wed)
		Lebouin, Chrystelle	150 (A02, Mon), 1111 (F03, Tue)	Lee, Kang Min	1082 (F01, Wed)
L		Leclerc, Maxime	1593 (I03, Sun)	Lee, Kang Taek	1765 (I05, Wed)
Labata, Marc Francis	2188 (Z01, Tue)	Leddy, John	1359 (H03, Tue), 1907 (L01, Tue)	Lee, Kang-Gyu	1444 (I01, Wed), 1469 (I01, Thu)
Labuta, Jan	937 (B08, Wed)	Ledendecker, Marc	1410 (I01, Tue)	Lee, Kendall	2113 (M03, Thu)
LaCoste, Jed	613 (B01, Tue), 613 (B01-09, Tue), 1419 (I01, Tue)	Leduc, Jennifer	1616 (I03, Mon)	Lee, Ki Bong	1085 (F01, Wed)
LaCoste, Jed	190 (A02, Mon), 200 (A02, Mon)	Ledwaba, Raesibe	29 (A01, Mon)	Lee, Kwan	679 (B02, Thu)
Lagoudas, Dimitris	499 (A04, Thu), 610 (B01, Tue), 610 (B01-09, Tue)	Lee, Ada	1878 (K03, Wed)	Lee, Lawrence Yoon Suk	1420 (I01, Tue)
Lai, Jianwei	490 (A04, Wed)	Lee, Albert	1406 (I01, Tue), 1574 (I02, Thu)	Lee, Min Jae	1478 (I02, Sun)
Lai, Wei	138 (A02, Sun)	Lee, Chaerin	1056 (E01, Wed), 1231 (G02, Wed)	Lee, Minbaek	1319 (H02, Tue)
Lai, Yong-Hong	115 (A02, Sun)	Lee, Chang Hwa	1051 (E01, Wed)	Lee, Moo Young	1469 (I01, Thu)
Laiko, Victor	2120 (M03, Thu)	Lee, Chang Young	679 (B02, Thu)	Lee, Nae-Eung	1305 (H02, Mon)
LaManna, Jacob	1741 (I05, Wed)	Lee, Chang-Soo	2073 (M03, Tue)	Lee, Norman	2114 (M03, Thu)
Lamb, Joshua	599 (A06, Wed)	Lee, Cheng-Che	1286 (H01, Tue)	Lee, Pui-kit	288 (A02, Tue), 328 (A02, Wed)
		Lee, Cheng-Yu	1058 (E01, Wed), 2172 (Z01, Tue)	Lee, Ryan	1871 (K02, Tue)
		Lee, Chongmok	2256 (Z03, Mon)	Lee, Sang-Ho	1176 (G01, Mon)
		Lee, Choong-Gon	1692 (I04, Tue)	Lee, Sang-Min	309 (A02, Wed)
		Lee, Chunghyuk	1741 (I05, Wed)	Lee, Seon-Hwa	222 (A02, Mon)
		Lee, Dong Geun	255 (A02, Tue)	Lee, Seong-Hun	2175 (Z01, Tue)
				Lee, Seung Woo	1440 (I01, Wed)
				Lee, Seung Woo	1684 (I04, Tue)

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Lee, Seung-Bok	1144 (F04, Wed), 1759 (I05, Wed), 1765 (I05, Wed)	Li, Dongguo	1406 (I01, Tue), 1475 (I02, Sun)	Li, Yige	592 (A06, Tue)
Lee, Seung-Hwan	414 (A03, Mon)	Li, Dongguo	1802 (I06, Tue)	Li, Ying	258 (A02, Tue)
Lee, Seung-Hyun	620 (B01, Tue), 620 (B01-09, Tue)	Li, Fang-Fang	776 (B05, Mon)	Li, Yingjie	266 (A02, Tue)
Lee, Seung-Jae	882 (B07, Tue)	Li, Fei	1875 (K03, Wed), 1883 (K03, Wed)	Li, Yong	1420 (I01, Tue)
Lee, Seunghyun	619 (B01, Tue), 619 (B01-09, Tue)	Li, Fei	2266 (Z03, Mon)	Li, Yuanchao	429 (A03, Tue)
Lee, Seungjin	240 (A02, Mon)	Li, Gang	84 (A01, Wed), 85 (A01, Wed)	Li, Yunchao	264 (A02, Tue)
Lee, Seungjun	218 (A02, Mon)	Li, Gongjin	1368 (H03, Wed)	Li, Yunfeng	733 (B03, Tue), 733 (B01-09, Tue)
Lee, Sewook	1483 (I02, Sun)	Li, Guang	1761 (I05, Wed)	Li, Yunsong	1131 (F04, Tue)
Lee, Shiwoo	1718 (I05, Tue)	Li, Guangfu	1412 (I01, Tue)	Li, Yunsong	376 (A02, Thu)
Lee, So Young	1478 (I02, Sun)	Li, Guosheng	456 (A03, Wed)	Li, Zhaodong	636 (B01, Wed)
Lee, Sungwon	1454 (I01, Wed)	Li, Han	704 (B03, Mon), 705 (B03, Mon)	Li, Zhaolin	319 (A02, Wed)
Lee, Timothy	1112 (F03, Tue)	Li, Hongna	1093 (F01, Thu)	Li, Zhe	1313 (H02, Mon)
Lee, Ui-Hyoung	1179 (G01, Mon)	Li, Hu	82 (A01, Wed), 1333 (H02, Tue)	Li, Zhe	78 (A01, Wed)
Lee, Wah-Keat	1696 (I05, Sun)	Li, Hu	1313 (H02, Mon)	Li, Zhe	596 (A06, Wed)
Lee, Yong Bin	1178 (G01, Mon)	Li, Hui	1680 (I04, Tue)	Li, Zhenyou	353 (A02, Thu)
Lee, Yong Min	194 (A02, Mon), 210 (A02, Mon), 214 (A02, Mon), 511 (A05, Sun)	Li, Jak	1931 (L02, Tue)	Li, Zhou	78 (A01, Wed), 82 (A01, Wed), 1313 (H02, Mon), 1330 (H02, Tue), 1333 (H02, Tue), 1737 (I05, Wed)
Lee, YongMin	228 (A02, Mon)	Li, Jialang (Christine)	1808 (I06, Tue)	Lian, Keryn	643 (B01, Thu), 1517 (I02, Tue), 1931 (L02, Tue)
Lee, Yongseok	465 (A04, Wed), 466 (A04, Wed)	Li, Jian	33 (A01, Mon), 220 (A02, Mon)	Lian, Torleif	566 (A06, Mon)
Lee, Yoon Ho	1469 (I01, Thu)	Li, Jiangtian	1708 (I05, Mon)	Liang, Kelly	1254 (G03, Wed)
Lee, Young	820 (B06, Mon)	Li, Jianlin	24 (A01, Mon), 358 (A02, Thu), 366 (A02, Thu), 392 (A02, Thu), 516 (A05, Sun), 599 (A06, Wed)	Liang, Liyuan	1870 (K02, Tue)
Lee, Young Hwan	1178 (G01, Mon)	Li, Jianyu	263 (A02, Tue), 356 (A02, Thu), 2136 (Z01, Tue)	Liang, Xinhua	34 (A01, Mon), 216 (A02, Mon), 308 (A02, Wed), 310 (A02, Wed), 1160 (F04, Thu)
Lee, Young-Jun	2170 (Z01, Tue), 2175 (Z01, Tue)	Li, Jie	104 (A01, Thu)	Liang, Yanliang	473 (A04, Wed), 1771 (I05, Thu)
Lee, Youngmi	2256 (Z03, Mon)	Li, Jin	1561 (I02, Wed), 2019 (M01, Tue), 2097 (M03, Wed)	Liang, Ying	1905 (L01, Tue), 1918 (L01, Wed)
Lee, Youseung	1182 (G01, Tue)	Li, Jin	220 (A02, Mon)	Liang, Zhiming	266 (A02, Tue), 457 (A03, Wed)
Lee, Yu-Wei	1058 (E01, Wed), 2172 (Z01, Tue)	Li, Jingkun	1485 (I02, Sun)	Liang, Zhixiu	1522 (I02, Tue), 1672 (I04, Tue), 1688 (I04, Tue)
Lee, Yueh-Lien	990 (C01, Mon)	Li, Jingnan	43 (A01, Mon)	Liao, Chen	262 (A02, Tue)
Lehmann, Michelle	450 (A03, Wed), 451 (A03, Wed), 452 (A03, Wed)	Li, Jirui	2126 (Z01, Tue)	Liao, Shih-Chieh	2009 (M01, Tue)
LeHuu, Duy	1047 (D01, Wed)	Li, Jun	1580 (I03, Sun)	Liao, Yu-Te	1264 (H01, Mon), 2082 (M03, Tue)
Lei, Jiafeng	290 (A02, Tue)	Li, Jun	635 (B01, Wed), 2087 (M03, Wed)	Liaw, Boryann	531 (A05, Mon), 595 (A06, Wed)
Lei, Jie	1459 (I01, Wed)	Li, Lain-Jong	227 (A02, Mon)	Licht, Stuart	1671 (I04, Tue)
Lei, Jie	271 (A02, Tue)	Li, Li	1872 (K03, Wed)	Liebenau, Dominik	165 (A02, Mon)
Leise, Jakob	1238 (G03, Tue)	Li, Ling	1242 (G03, Tue)	Lienau, Karla	1992 (L04, Wed)
Lemaire, Peter	36 (A01, Mon)	Li, Luxi	306 (A02, Wed)	Lim, Gary	912 (B08, Tue), 912 (B01-09, Tue)
Lemarie, Quentin	546 (A05, Mon), 557 (A05, Tue)	Li, Mei	1084 (F01, Wed), 1086 (F01, Wed), 1087 (F01, Wed)	Lim, Gyu-Seok	2158 (Z01, Tue)
Lemme, Max	827 (B06, Mon)	Li, Mengliu	227 (A02, Mon)	Lim, Hyung-Tae	202 (A02, Mon)
Lenihan, Catherine	439 (A03, Wed)	Li, Ming	2072 (M03, Tue)	Lim, Hyung-Tae	1753 (I05, Wed)
Lennon, Alison	283 (A02, Tue), 515 (A05, Sun)	Li, Mingqian	1194 (G01, Wed)	Lim, Hyung-Tae	213 (A02, Mon), 1754 (I05, Wed)
Leon, Carlos	1847 (K01, Mon)	Li, Ning	182 (A02, Mon), 307 (A02, Wed)	Lim, Jeonghoon	1684 (I04, Tue)
Leon, Marino	2082 (M03, Tue)	Li, Peng	243 (A02, Mon)	Lim, JeongHoon	1738 (I05, Wed)
Léonard, François	738 (B03, Wed), 739 (B03, Wed)	Li, Qiuyan	171 (A02, Mon), 257 (A02, Tue)	Lim, Matthew	420 (A03, Tue)
Leonard, McLain	1105 (F03, Tue)	Li, Ruihu	530 (A05, Mon)	Lim, Sean	515 (A05, Sun)
Lepage, David	68 (A01, Tue), 489 (A04, Wed)	Li, Ruizhu	33 (A01, Mon), 220 (A02, Mon)	Lim, Taehoon	237 (A02, Mon)
Lercher, Johannes	1091 (F01, Thu), 1612 (I03, Mon), 1625 (I03, Tue)	Li, Runlai	1561 (I02, Wed), 2097 (M03, Wed)	Lim, Tak-Hyoung	1759 (I05, Wed), 1765 (I05, Wed)
Lerner, Betiana	2103 (M03, Wed)	Li, Shang	2202 (Z01, Tue)	Lima, Fabio	1758 (I05, Wed)
Lestriez, Bernard	537 (A05, Mon)	Li, Shiban	857 (B07, Sun)	Lima, Jéssica	2045 (M01, Wed)
Letteri, Rachel	2144 (Z01, Tue)	Li, Sipei	461 (A04, Wed)	Lima, Thiago	611 (B01, Tue), 611 (B01-09, Tue)
Leung, Benjamin	1273 (H01, Tue)	Li, Tao	251 (A02, Tue)	Lin, Chao-Cheng	1168 (G01, Mon)
Leusink, Gert	1167 (G01, Mon)	Li, Tianchi	885 (B07, Tue)	Lin, Chao-Sung	991 (C01, Mon)
LeVasseur, Grant	939 (B08, Thu)	Li, Wangda	263 (A02, Tue), 315 (A02, Wed)	Lin, Chao-Sung	981 (C01, Mon), 1081 (F01, Wed)
Levert, Joseph	1041 (D01, Tue)	Li, Wangxiang	964 (B09, Wed)	Lin, Cheng-Hung	536 (A05, Mon)
Levitas, Benjamin	1714 (I05, Tue)	Li, Wei	427 (A03, Tue)	Lin, Chih-Ting	1304 (H02, Mon), 1340 (H02, Wed), 1342 (H02, Wed)
Lewerenz, Meinert	517 (A05, Sun), 549 (A05, Mon)	Li, Weiyang	152 (A02, Mon), 389 (A02, Thu), 604 (A06, Wed)	Lin, Ching-Wei	701 (B03, Mon)
Lewis, Eric	688 (B02, Thu)	Li, Wenlong	1084 (F01, Wed)	Lin, Chuen-Chang	197 (A02, Mon)
Lewis, Nathan	1202 (G02, Tue), 1209 (G02, Tue), 1212 (G02, Tue), 1223 (G02, Wed), 2066 (M02, Wed)	Li, Wenshen	1267 (H01, Mon)	Lin, Chen-Yu	2025 (M01, Wed)
Li, An-Ping	825 (B06, Mon)	Li, Xianfeng	405 (A03, Mon), 2134 (Z01, Tue), 2135 (Z01, Tue)	Lin, Danni	1054 (E01, Wed)
Li, Bin	417 (A03, Tue)	Li, Xiaoan	1808 (I06, Tue)	Lin, Feng	139 (A02, Sun), 469 (A04, Wed), 538 (A05, Mon), 594 (A06, Tue)
Li, Bing	1453 (I01, Wed)	Li, Xiaodong	651 (B01, Thu)	Lin, Hao-Wei	1418 (I01, Tue)
Li, Bingrui	450 (A03, Wed)	Li, Xiaolian	1365 (H03, Tue)	Lin, He	1910 (L01, Tue)
Li, Bor-Ran	2249 (Z02, Mon)	Li, Xiaolin	179 (A02, Mon)	Lin, Heng-Han	343 (A02, Wed)
Li, Bor-Ran	1344 (H02, Wed)	Li, Xiaomeng	789 (B05, Tue)	Lin, Hsin-Chih	1080 (F01, Wed)
Li, Chen Zhong	1335 (H02, Wed), 2071 (M03, Tue)	Li, Xin	63 (A01, Tue)	Lin, Jenshan	1264 (H01, Mon), 2082 (M03, Tue)
Li, Chenliang	1842 (K01, Mon)	Li, Xinlin	927 (B08, Wed)	Lin, Jingyu	1271 (H01, Mon)
Li, Chi-Ying Vanessa	428 (A03, Tue)	Li, Xinyu	70 (A01, Wed)	Lin, John	1919 (L01, Wed)
Li, Chris	1032 (D01, Tue)	Li, Xue	431 (A03, Tue)	Lin, Kai chun	2080 (M03, Tue)
		Li, Xuemin	313 (A02, Wed), 1120 (F03, Tue)	Lin, Kai-Chun	2101 (M03, Wed)
		Li, Yalun	585 (A06, Tue)	Lin, Kun-Han	662 (B01-09, Tue), 662 (B02, Tue)
		Li, Yan	707 (B03, Mon)	Lin, Lei	391 (A02, Thu)
		Li, Yifan	1445 (I01, Wed), 1480 (I02, Sun)		
		Li, Yifan	1437 (I01, Wed)		

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Lin, Li-Kai	1930 (L02, Tue)	Liu, Xiang	579 (A06, Tue), 593 (A06, Tue)	Lovko, Vincent	2000 (M01, Mon)
Lin, Qiao	2121 (M03, Thu)	Liu, Xiaowei	1012 (C01, Tue), 1563 (I02, Wed)	Low, Qi	1668 (I03, Thu)
Lin, Ruoqian	1672 (I04, Tue)	Liu, Xiaoyang	783 (B05, Mon), 791 (B05, Tue)	Löwe, Armin	1647 (I03, Wed)
Lin, Tong	2071 (M03, Tue)	Liu, Xiaoyang	1003 (C01, Tue)	Lowe, James	1704 (I05, Mon)
Lin, Xiang-De	1408 (I01, Tue)	Liu, Xijun	1672 (I04, Tue)	Lowe, Michael	1098 (F02, Mon)
Lin, Xiaodong	271 (A02, Tue)	Liu, Xingbo	427 (A03, Tue)	Lozada-Ramirez, Jose Daniel	766 (B04, Thu)
Lin, Yi	649 (B01, Thu)	Liu, Xingbo	269 (A02, Tue)	Lu, Chia-Yang	217 (A02, Mon)
Lin, Yu-Jhen	1341 (H02, Wed)	Liu, Xinye	1671 (I04, Tue)	Lu, Deyu	536 (A05, Mon)
Lin, Yu-Jiung	1348 (H02, Wed)	Liu, Xitong	2246 (Z02, Mon)	Lu, Dongping	132 (A02, Sun)
Lin, Zaiwen	1457 (I01, Wed)	Liu, Yi	814 (B06, Mon)	Lu, Fei	2016 (M01, Tue)
Lin, Zong-Hong	1310 (H02, Mon), 1341 (H02, Wed), 1357 (H03, Tue)	Liu, Yi-Hung	343 (A02, Wed)	Lu, Ganhua	1300 (H02, Mon)
Lin, Zong-Hong	1348 (H02, Wed)	Liu, Yihua	1887 (L01, Mon), 2262 (Z03, Mon)	Lu, Hai	110 (A02, Sun), 129 (A02, Sun)
Lindberg, Simon	654 (B01, Thu)	Liu, Yihua	1055 (E01, Wed)	Lu, Haipeng	872 (B07, Mon)
Lindfors, Klas	845 (B06, Tue)	Liu, Ying	173 (A02, Mon), 394 (A02, Thu), 399 (A02, Thu), 597 (A06, Wed)	Lu, Jun	647 (B01, Thu)
Lindsay, Maria	1827 (I06, Wed)	Liu, Yipeng	975 (C01, Mon)	Lu, Kuo-Chang	1287 (H01, Tue)
Ling, Pinghua	1886 (L01, Mon)	Liu, Yongqiang	1924 (L01, Wed)	Lu, Languang	530 (A05, Mon), 568 (A06, Mon), 579 (A06, Tue), 581 (A06, Tue), 582 (A06, Tue), 585 (A06, Tue), 590 (A06, Tue), 593 (A06, Tue)
Ling, Sichun	1027 (C01, Wed), 1028 (C01, Wed), 1029 (C01, Wed)	Liu, Yu-Hsuan	1682 (I04, Tue)	Lu, Luwen	2166 (Z01, Tue)
Linhart, Abigail	2233 (Z01, Tue)	Liu, Yuanchao	1147 (F04, Wed)	Lu, Matthew	1713 (I05, Tue), 1719 (I05, Tue)
Link, Stephan	873 (B07, Mon), 879 (B07, Mon), 1912 (L01, Tue), 1926 (L01, Wed)	Liu, Yuanyue	830 (B06, Mon), 1327 (H02, Tue), 1959 (L03, Tue)	Lu, Nianduan	1242 (G03, Tue)
Linsenmann, Fabian	146 (A02, Sun)	Liu, Yunzhi	1495 (I02, Sun)	Lu, Ping	2016 (M01, Tue), 2017 (M01, Tue)
Liosi, Korinne	771 (B05, Mon)	Liu, Yunzhi	929 (B08, Wed)	Lu, Shao-Yung	2082 (M03, Tue)
Lister, Shawn	1811 (I06, Tue)	Liu, Yuzi	246 (A02, Tue)	Lu, Shih-Yuan	1418 (I01, Tue)
Liu, Baichen	442 (A03, Wed), 505 (A04, Thu)	Liu, Zhe	1131 (F04, Tue)	Lu, Weihao	1364 (H03, Tue)
Liu, Bin	171 (A02, Mon)	Liu, Zhixiao	103 (A01, Thu)	Lu, Wenjing	2134 (Z01, Tue)
Liu, Bin	635 (B01, Wed)	Liu, Zhonggang	1999 (M01, Mon)	Lu, Wenquan	646 (B01, Thu)
Liu, Bin	257 (A02, Tue)	Liu, Zhongxiao	596 (A06, Wed)	Lu, Xiaochuan	134 (A02, Sun), 456 (A03, Wed)
Liu, Binghe	574 (A06, Mon), 575 (A06, Mon)	Liu, Zhuo	1313 (H02, Mon)	Lu, Xuekun	518 (A05, Sun)
Liu, Chaofeng	384 (A02, Thu)	Llinas, Juan Pablo	843 (B06, Tue)	Lu, Yanchen	1724 (I05, Tue)
Liu, Chia-Chen	1310 (H02, Mon)	Llorente, Irene	998 (C01, Tue)	Lu, Yi-Chun	424 (A03, Tue)
Liu, Di-Jia	1443 (I01, Wed), 1498 (I02, Mon), 2210 (Z01, Tue)	Lo, Chiao-Yun	1301 (H02, Mon)	Lu, Yi-Sheng	990 (C01, Tue)
Liu, Dongqiang	1766 (I05, Thu)	Lobko, Yevheniia	1447 (I01, Wed)	Lu, Zhanpeng	996 (C01, Tue), 997 (C01, Tue), 1022 (C01, Wed), 1027 (C01, Wed), 1028 (C01, Wed), 1029 (C01, Wed)
Liu, Ershuai	1384 (I01, Sun), 1394 (I01, Mon), 1402 (I01, Mon)	Lobo, Anderson	754 (B04, Tue), 754 (B01-09, Tue), 756 (B04, Thu)	Lu, Zhipeng	1385 (I01, Sun)
Liu, Fupin	785 (B05, Mon)	Lobo, Brian	2082 (M03, Tue)	Lu, Zhuoxin	1430 (I01, Wed), 1452 (I01, Wed)
Liu, Gang	1620 (I03, Tue)	Lobo Checa, Jorge	920 (B08, Wed)	Lu, Zijie	130 (A02, Sun), 1539 (I02, Wed)
Liu, Gao	18 (A01, Mon)	Locatelli, Denis	1253 (G03, Wed)	Lubers, Alia	1461 (I01, Thu), 1487 (I02, Sun)
Liu, Guangdong	1546 (I02, Wed)	Lochala, Joshua	43 (A01, Mon), 474 (A04, Wed), 477 (A04, Wed), 487 (A04, Wed)	Lubomirsky, Igor	2004 (M01, Tue)
Liu, Guokun	1123 (F04, Tue)	Lockwood, David	1172 (G01, Mon)	Lucht, Brett	260 (A02, Tue)
Liu, Hao-Wen	3 (A01, Sun), 166 (A02, Mon)	Loeb, Colin	1066 (F01, Wed)	Luisier, Mathieu	1182 (G01, Tue)
Liu, Haodong	472 (A04, Wed)	Loesch, Chris	1047 (D01, Wed)	Luk, Patrick	107 (A01, Thu)
Liu, Hongjun	1745 (I05, Wed)	Loew, Noya	1840 (K01, Mon), 1935 (L02, Tue), 2227 (Z01, Tue)	Lukmanov, Rustam	1060 (E01, Wed)
Liu, Hongyun	1868 (K02, Tue)	Lombard, Stephanie	1253 (G03, Wed)	Lum, June	1354 (H03, Tue)
Liu, Jiaqi	1548 (I02, Wed)	Lombardo, Salvatore	1435 (I01, Wed)	Lumer, Juliana	1034 (D01, Tue)
Liu, Jin-Xun	1662 (I03, Thu)	Lombardo, Teo	378 (A02, Thu)	Lumley, Margaret	57 (A01, Tue)
Liu, Jinglin	2258 (Z03, Mon)	Loney, Charles	1677 (I04, Tue)	Luo, Huimin	1075 (F01, Wed)
Liu, Jingyuan	1008 (C01, Tue)	Long, Jeffrey	383 (A02, Thu), 496 (A04, Thu), 1518 (I02, Tue), 1769 (I05, Thu), 2147 (Z01, Tue)	Luo, Jianmin	604 (A06, Wed)
Liu, Jun	818 (B06, Mon), 1932 (L02, Tue)	Long, Yi-Tao	2257 (Z03, Mon)	Luo, Jun	1672 (I04, Tue)
Liu, Jun	123 (A02, Sun)	Long, Zhuoran	1954 (L03, Tue)	Luo, Liu	133 (A02, Sun), 2137 (Z01, Tue)
Liu, Jun	1040 (D01, Tue)	Loo, Nicholas	1668 (I03, Thu)	Luo, Long	1436 (I01, Wed), 2264 (Z03, Mon)
Liu, Jun	132 (A02, Sun), 379 (A02, Thu)	Lopes, Pietro	1398 (I01, Mon), 1414 (I01, Tue), 1797 (I06, Tue), 1971 (L04, Mon)	Luo, Raru	1674 (I04, Tue)
Liu, Kunlei	1104 (F03, Tue)	Lopez, Arielle	2119 (M03, Thu)	Luo, Reng-Hong	1371 (H03, Wed)
Liu, Lifeng	1416 (I01, Tue), 1640 (I03, Tue)	Lopez, Carlos	583 (A06, Tue)	Luo, Xiaoying	547 (A05, Mon)
Liu, Lin	602 (A06, Wed)	Lopez, Jorge	184 (A02, Mon), 185 (A02, Mon), 186 (A02, Mon), 294 (A02, Tue)	Luo, Xubo	1815 (I06, Wed)
Liu, Lu	925 (B08, Wed)	Lopez Ruiz, Juan A.	1091 (F01, Thu)	Luo, Yuting	533 (A05, Mon)
Liu, Meilin	1547 (I02, Wed)	Lopez-Urias, Florentino	758 (B04, Thu), 767 (B04, Thu)	Luo, Zhijun	1563 (I02, Wed)
Liu, Mengjie	1420 (I01, Tue)	Lorenz, Roxana	1240 (G03, Tue)	Lupetin, Piero	1119 (F03, Tue), 1150 (F04, Wed), 1752 (I05, Wed)
Liu, Nian	1774 (I05, Thu)	Lotfi, Ardalan	2027 (M01, Wed)	Lust, Enn	142 (A02, Sun)
Liu, Ning	1204 (G02, Tue), 2061 (M02, Wed)	Lottin, Olivier	1377 (H03, Wed)	Luther, Joseph	864 (B07, Mon)
Liu, Ping	472 (A04, Wed)	Lou, Bih	2035 (M01, Wed)	Luthra, Prabhjot	1878 (K03, Wed)
Liu, Qian	258 (A02, Tue)	Lou, Kun	432 (A03, Tue), 459 (A03, Wed), 1570 (I02, Thu)	Lutkenhaus, Jodie	499 (A04, Thu)
Liu, Qichao	1377 (H03, Wed)	Loubat, Anais	1220 (G02, Wed)	Lutkenhaus, Jodie	301 (A02, Tue), 607 (A06, Wed), 610 (B01, Tue), 610 (B01-09, Tue), 1875 (K03, Wed), 1883 (K03, Wed), 2144 (Z01, Tue)
Liu, Qing	321 (A02, Wed)	Loufakis, Dimitrios	610 (B01, Tue), 610 (B01-09, Tue)	Lüttgens, Jan	698 (B03, Mon)
Liu, Qinyuan	1721 (I05, Tue)	Lovander, Matthew	1907 (L01, Tue)	Lutz, Brian	979 (C01, Mon), 980 (C01, Mon)
Liu, Shi-Xia	920 (B08, Wed)	Love, Corey	578 (A06, Tue), 598 (A06, Wed)	Lv, Haifeng	1797 (I06, Tue)
Liu, Teng	397 (A02, Thu)	Loveridge, Melanie	561 (A05, Tue)	Lv, Hong	1453 (I01, Wed)
Liu, Ting-Ruei	8 (A01, Sun)			Lv, Yingying	164 (A02, Mon)
Liu, Tzu-Ling	1186 (G01, Tue)			Lvov, Serguei	2018 (M01, Tue)
Liu, Wanjiào	1079 (F01, Wed)			Lynch, Robert	418 (A03, Tue), 439 (A03, Wed)
Liu, Wenwen	956 (B09, Tue), 956 (B01-09, Tue)				
Liu, Wenwen	955 (B09, Tue), 955 (B01-09, Tue), 971 (B09, Thu)				

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Lyon, Jacob	1907 (L01, Tue)	Mangherini, Giulio	251 (A02, Tue)	Martinez, Ulises	1489 (I02, Sun)
Lyonnard, Sandrine	540 (A05, Mon)	Mani, Prasanna	1390 (I01, Mon)	Martinez, Xavier	36 (A01, Mon)
Lyu, Hailong	248 (A02, Tue), 264 (A02, Tue), 1568 (I02, Wed)	Manikandan, P.	16 (A01, Mon)	Martinez-Diaz, M. Victoria	933 (B08, Wed)
M					
Ma, Bingyuan	145 (A02, Sun)	Manikandan, Venkatesh	1999 (M01, Mon)	Martinez-Duarte, Rodrigo	2153 (Z01, Tue)
Ma, Dongling	1615 (I03, Mon), 2069 (M03, Tue)	Manjunatha, Revanasiddappa	1679 (I04, Tue)	Martinez-Edo, Gabriel	954 (B08, Thu)
Ma, Jiarong	996 (C01, Tue), 997 (C01, Tue), 1022 (C01, Wed), 1027 (C01, Wed), 1028 (C01, Wed), 1029 (C01, Wed)	Manke, Ingo	539 (A05, Mon)	Martinez-Hincapie, Ricardo	1888 (L01, Mon)
Ma, Ke	1983 (L04, Tue)	Mann, Florian	722 (B03, Tue)	Martinez-Ibañez, Maria	153 (A02, Mon)
Ma, Nattapol	275 (A02, Tue), 385 (A02, Thu)	Mann, Shane	412 (A03, Mon), 413 (A03, Mon)	Martinez-Morales, Alfredo	240 (A02, Mon)
Ma, Xiangkun	444 (A03, Wed)	Manoukian, Mourad	1852 (K01, Mon), 2000 (M01, Mon), 2094 (M03, Wed)	Martinez-Morales, Alfredo	226 (A02, Mon), 237 (A02, Mon)
Ma, Ying	277 (A02, Tue)	Manso, Ryan	1426 (I01, Tue)	Martinez-Pacheco, Mariana	766 (B04, Thu)
Ma, Zilong	1104 (F03, Tue)	Manso, Ryan	1451 (I01, Wed)	Martinez-Vargas, David	2245 (Z02, Mon)
Macairan, Jun-Ray	672 (B02, Wed)	Mansoor, Naqsh E.	817 (B06, Mon), 2086 (M03, Wed)	Martinie, Sebastien	1198 (G01, Wed)
Macak, Jan	837 (B06, Tue), 2060 (M02, Wed)	Mansour, Azzam	73 (A01, Wed), 96 (A01, Thu), 212 (A02, Mon), 338 (A02, Wed)	Marumoto, Kazuhiro	854 (B07, Sun)
Macaulay, Natalia	1805 (I06, Tue)	Mantelli, Harlan	1888 (L01, Mon)	Maruszczyk, Anika	1150 (F04, Wed)
Machida, Hideaki	738 (B06, Tue)	Manthiram, Arumugam	356 (A02, Thu), 2136 (Z01, Tue)	Maruyama, Benji	1370 (H03, Wed)
Machiya, Hidenori	844 (B03, Wed)	Manthiram, Arumugam	126 (A02, Sun), 249 (A02, Tue)	Maruyama, Shigeo	626 (B01, Wed), 709 (B03, Mon), 794 (B05, Tue)
Maciel Silva, Roberta	2250 (Z02, Mon)	Manthiram, Arumugam	122 (A02, Sun), 124 (A02, Sun), 133 (A02, Sun), 263 (A02, Tue), 315 (A02, Wed), 446 (A03, Wed), 2137 (Z01, Tue)	Maruyama, Takahiro	1493 (I02, Sun)
Madachy, Steven	1541 (I02, Wed)	Manthiram, Arumugam	127 (A02, Sun), 188 (A02, Mon), 497 (A04, Thu)	Mary, K. A. Ann	1391 (I01, Mon)
Maddar, Faduma	561 (A05, Tue)	Manthiram, Karthish	1670 (I04, Tue)	Maschmeyer, Thomas	2056 (M02, Wed)
Madkikar, Pankaj	1793 (I06, Mon)	Manyala, Ncholu	654 (B01, Thu)	Mashayek, Farzad	603 (A06, Wed), 606 (A06, Wed)
Mados, Edna	300 (A02, Wed)	Manyala, Ncholu	614 (B01, Tue), 614 (B01-09, Tue)	Masias, Alvaro	161 (A02, Mon), 572 (A06, Mon)
Madria, Pranal	467 (A04, Wed)	Mao, Chengyu	173 (A02, Mon), 358 (A02, Thu), 399 (A02, Thu)	Masikhwa, Tshifhiwa	614 (B01, Tue), 614 (B01-09, Tue), 654 (B01, Thu)
Maeda, Chihiro	952 (B08, Thu)	Mao, Guangzhao	2077 (M03, Tue)	Masquelier, Christian	468 (A04, Wed), 544 (A05, Mon)
Maeda, Hiromitsu	949 (B08, Thu)	Mao, Lanqun	1903 (L01, Tue)	Mastel, Stefan	962 (B09, Wed)
Maeda, Kazuhiko	1649 (I03, Thu), 1652 (I03, Thu)	Mao, Linchang	1761 (I05, Wed)	Masud, Jahangir	1411 (I01, Tue), 1642 (I03, Wed), 2038 (M01, Wed)
Maeda, Mari	2159 (Z01, Tue)	Mao, Linchang	1761 (I05, Wed)	Masuda, Hideki	895 (B07, Tue)
Maeng, Jimin	89 (A01, Wed), 1848 (K01, Mon)	Maraschky, Adam	377 (A02, Thu)	Masuda, Takuya	2064 (M02, Wed)
Maeyoshi, Yuta	268 (A02, Tue), 653 (B01, Thu)	Marbella, Lauren	558 (A05, Tue)	Masuda, Takuya	529 (A05, Mon)
Magagnin, Luca	406 (A03, Mon), 2093 (M03, Wed)	Marciano, Fernanda	754 (B04, Tue), 754 (B01-09, Tue)	Masuda, Yuya	1916 (L01, Wed)
Magee, Katherine	2107 (M03, Wed)	Marco, Jose	763 (B04, Thu)	Masurkar, Nirul	2039 (M01, Wed)
Maggard, Paul	2058 (M02, Wed)	Marechal, Manuel	1571 (I02, Thu)	Matanovic, Ivana	1406 (I01, Tue), 1574 (I02, Thu), 1676 (I04, Tue), 1685 (I04, Tue)
Magna, Gabriele	898 (B08, Tue)	Mariani, Robert	2104 (M03, Wed)	Mathias, Mark	1789 (I06, Mon)
Magsino, Prince	317 (A02, Wed)	Mariani, Stefano	748 (B03, Wed), 2112 (M03, Wed)	Mathur, Ankita	509 (A04, Thu)
Mahapatro, Anil	2251 (Z02, Mon)	Maric, Radenka	1521 (I02, Tue), 1532 (I02, Wed), 1549 (I02, Wed)	Mathur, Sanjay	1616 (I03, Mon)
Maheshwari, Shantanu	1130 (F04, Tue)	Marin, Christopher	1996 (L04, Wed)	Matic, Aleksandar	654 (B01, Thu)
Maheshwari, Sharad	1677 (I04, Tue)	Mariñas, Victor	933 (B08, Wed)	Matios, Edward	152 (A02, Mon)
Mahlendorf, Falko	416 (A03, Mon)	Markland, Thomas	1948 (L03, Mon)	Matolin, Vladimir	1447 (I01, Wed)
Mahmood, Samsuddin	1997 (L04, Wed)	Markötter, Henning	539 (A05, Mon)	Matolinová, Iva	1447 (I01, Wed)
Mahurin, Shannon	20 (A01, Mon)	Markovic, Nenad	1398 (I01, Mon), 1414 (I01, Tue), 1797 (I06, Tue), 1971 (L04, Mon)	Matos, Juan	755 (B04, Thu)
Mahvash, Farzaneh	834 (B06, Tue)	Markovitch, Angel	1705 (I03, Mon)	Matsuda, Hirofumi	1890 (L01, Mon)
Mai, Liqiang	340 (A02, Wed)	Marsal, Lluís	1234 (G03, Tue), 1338 (H02, Wed)	Matsuda, Yuki	143 (A02, Sun)
Mai, Phuoc Van	548 (A05, Mon)	Marschall, Roland	1594 (I03, Sun)	Matsue, Tomokazu	1845 (K01, Mon), 2259 (Z03, Mon), 2267 (Z03, Mon)
Mai, Weijie	324 (A02, Wed), 576 (A06, Tue), 1136 (F04, Wed)	Marschilok, Amy	316 (A02, Wed), 564 (A06, Mon)	Matsui, Hirofumi	943 (B08, Thu)
Maier, Maximilian	64 (A01, Tue)	Marshak, Michael	422 (A03, Tue), 507 (A04, Thu)	Matsui, Masaki	388 (A02, Thu)
Maillard, Frederic	1544 (I02, Wed), 1972 (L04, Mon)	Martel, Richard	700 (B03, Mon)	Matsui, Yasunori	889 (B07, Tue)
Maindan, Karan	927 (B08, Wed)	Martha, Surendra	141 (A02, Sun)	Matsukawa, Takashi	1197 (G01, Wed)
Mainka, Julia	1377 (H03, Wed)	Marti, Angel	688 (B02, Thu)	Matsuki, T.	1197 (G01, Wed)
Maire, Eric	537 (A05, Mon), 557 (A05, Tue)	Martin, Curtis	73 (A01, Wed)	Matsumoto, Futoshi	2138 (Z01, Tue), 2139 (Z01, Tue), 2140 (Z01, Tue)
Maity, Arnab	1300 (H02, Mon)	Martin, David	2258 (Z03, Mon)	Matsumoto, Masashi	1572 (I02, Thu)
Majumdar, Diptarka	1153 (F04, Thu)	Martin, Witness	487 (A04, Wed)	Matsunami, Hiroaki	1880 (K03, Wed)
Majumder, Subhasish	2026 (M01, Wed)	Martin-Martinez, Francisco	500 (A04, Thu)	Matsuo, Yutaka	774 (B05, Mon), 926 (B08, Wed)
Makagon, Evgeniy	2004 (M01, Tue)	Martin-Pedrosa, Fernando	899 (B08, Tue)	Matsuo, Yutaka	624 (B01, Wed), 626 (B01, Wed), 794 (B05, Tue)
Maldonado, Stephen	1222 (G02, Wed)	Martinati, Miles	716 (B03, Tue)	Matsuoka, Hikaru	1634 (I03, Tue)
Malekpour, Soheil	1976 (L04, Tue)	Martinet, Sebastien	357 (A02, Thu)	Matsuyama, Tatsuo	235 (A02, Mon)
Mali, Gregor	62 (A01, Tue)	Martinez, Keri	1033 (D01, Tue)	Matsuzawa, Koichi	1423 (I01, Tue), 1505 (I02, Mon)
Mali, Kunal	835 (B06, Tue)	Martinez, Madison	1422 (I01, Tue)	Mattick, Victoria	1399 (I01, Mon)
Malik, Monu	74 (A01, Wed), 345 (A02, Thu)			Matyjaszewski, Krzysztof	461 (A04, Wed)
Malladi, Sairam	2036 (M01, Wed)			Mauger, Scott	1506 (I02, Mon), 1512 (I02, Tue), 1536 (I02, Wed)
Mallikarjunan, Anupama	1032 (D01, Tue)			Mault, Travis	177 (A02, Mon)
Mandai, Toshihiko	388 (A02, Thu)			Maurya, Sandip	448 (A03, Wed), 1575 (I02, Thu), 1678 (I04, Tue)
Mandal, Animesh	247 (A02, Tue)				
Mandal, Mrinmay	1733 (I05, Wed)				
Mane, Anil	332 (A02, Wed), 334 (A02, Wed), 1460 (I01, Thu)				
Mane, Suyash	2110 (M03, Wed)				
Mangalaraja, R. V.	1289 (H01, Tue)				

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Mauter, Meagan	2171 (Z01, Tue), 2240 (Z02, Mon), 2246 (Z02, Mon)	Menezes, Shalini	2059 (M02, Wed)	Miyake, Hideaki	625 (B01, Wed)
Mauzeroll, Janine	1841 (K01, Mon)	Meng, Shirley	1772 (I05, Thu)	Miyake, Masao	1074 (F01, Wed)
Mavrikakis, Manos	1800 (I06, Tue)	Meng, Xiangbo	131 (A02, Sun), 136 (A02, Sun), 155 (A02, Mon), 306 (A02, Wed), 366 (A02, Thu), 1924 (L01, Wed)	Miyake, Takeo	1842 (K01, Mon)
Mavrikakis, Manos	846 (B06, Tue)	Meng, Xin	2121 (M03, Thu)	Miyamae, Chie	888 (B07, Tue)
Mawari, Nemi	1777 (I05, Thu)	Meng, Ying Shirley	1767 (I05, Thu)	Miyamoto, Daiki	625 (B01, Wed)
Mayer, Matthew	1479 (I02, Sun)	Meng, Zihan	2154 (Z01, Tue)	Miyashita, Tomofumi	1149 (F04, Wed)
Mayer, Steve	1125 (F04, Tue)	Menk, Lyle	1195 (G01, Wed), 1196 (G01, Wed)	Miyatake, Kenichiro	401 (A03, Mon)
Mayer, Thomas	858 (B07, Sun), 1207 (G02, Tue), 2221 (Z01, Tue)	Menkin, Svetlana	300 (A02, Wed)	Miyauuchi, Yuhei	746 (B03, Wed)
Mayilvahanan, Karthik	1122 (F04, Tue)	Mennel, Jason	1778 (I05, Thu)	Miyazaki, Reona	355 (A02, Thu)
Mayrhofer, Karl	1410 (I01, Tue), 1442 (I01, Wed)	Mermoux, Michel	1021 (C01, Wed)	Mizunuma, Mamoru	1019 (C01, Tue), 1023 (C01, Wed)
Mazur, Ursula	916 (B08, Wed), 917 (B08, Wed)	Meroni, Davide	2093 (M03, Wed)	Mizushima, Ichiro	1294 (H01, Wed)
Mazzamuto, Fulvio	1183 (G01, Tue)	Merrill, Laura	498 (A04, Thu), 542 (A05, Mon)	Mlynarski, Amy	2156 (Z01, Tue)
McAllister, James	1386 (I01, Sun)	Merrill, McKenna	1872 (K03, Wed)	Mnatsakanian, Armen	177 (A02, Mon)
McCafferty, Liam	386 (A02, Thu)	Meshtot, Eric	67 (A01, Tue), 95 (A01, Thu), 708 (M03, Mon)	Mo, Boshan	1724 (I05, Tue)
McCatty, Steve	1424 (A01, Tue)	Messinger, Robert	506 (A04, Thu), 535 (A05, Mon), 545 (A05, Mon)	Mochizuki, Dai	1524 (I02, Tue)
McCloskey, Bryan	307 (A02, Wed), 347 (A02, Thu), 1936 (L02, Tue)	Meulenberg, Wilhelm	1728 (I05, Tue)	Moffat, Thomas	1051 (E01, Wed), 1057 (E01, Wed), 1059 (E01, Wed), 1123 (F04, Tue)
McColl, Kit	387 (A02, Thu)	Meyer, Harry	248 (A02, Tue), 264 (A02, Tue), 1499 (I02, Mon)	Moganty, Surya	589 (A06, Tue)
McCool, Geoffrey	1461 (I01, Thu), 1487 (I02, Sun)	Meyer, Laura	1091 (F01, Thu), 1612 (I03, Mon), 1625 (I03, Tue)	Mohajeri, Soha	2012 (M01, Tue)
McCormack, Patrick	519 (A05, Sun)	Meyyappan, M.	2087 (M03, Wed)	Mohamed, Abdelrhman	1838 (K01, Mon), 1844 (K01, Mon)
McCormick, Byron	1782 (I06, Mon)	Mezavilla, Stefano	1589 (I03, Sun)	Mohamed, Firas	1239 (G03, Tue)
McCulley, Calla	1257 (G03, Wed)	Michaelis, Charles	241 (A02, Mon)	Mohammad, Abdul	2 (A01, Sun)
McCune, Curt	1211 (G02, Tue)	Michor, Herwig	1115 (F03, Tue)	Mohammad, Irshad	346 (A02, Thu)
McDaniel, Anthony	1389 (I01, Mon)	Middlemiss, Laurence	480 (A04, Wed)	Mohammed, Omar	867 (B07, Mon)
McDOWELL, Meredith	688 (B02, Thu)	Mier, Frank	605 (A06, Wed)	Mohan, Chandra	2029 (M01, Wed)
McGehee, Michael	21 (A01, Mon)	Mikhaylova, Veronika	1861 (K02, Tue), 2218 (Z01, Tue)	Mohan, Susmitha	1218 (G02, Tue), 2177 (Z01, Tue), 2178 (Z01, Tue), 2183 (Z01, Tue)
McGehee, Michael	1927 (L01, Wed)	Mikos, Allie	2156 (Z01, Tue), 2163 (Z01, Tue)	Mohanty, Shaswat	102 (A01, Thu)
McGlone, Joe	1263 (H01, Mon)	Milazzo, Rachela	1435 (I01, Wed)	Mohanty, Swomitra	2234 (Z01, Tue)
McGlynn, Jessica	1383 (I01, Sun), 1386 (I01, Sun)	Miller, Elisa	724 (B03, Tue), 820 (B06, Mon), 839 (B06, Tue), 872 (B07, Mon)	Mohanty, Swomitra	2116 (M03, Thu), 2118 (M03, Thu), 2238 (Z01, Tue)
McGowan, Christopher	1041 (D01, Tue)	Miller, Eric	1389 (I01, Mon)	Mohseni, Parsian	1216 (G02, Tue)
McHugh, Patrick	1925 (L01, Wed)	Miller, Hamish	1521 (I02, Tue)	Mojica, Felipe	2190 (Z01, Tue), 2191 (Z01, Tue), 2193 (Z01, Tue)
McIntosh, Steven	1711 (I05, Mon), 1725 (I05, Tue)	Miller, Mallory	1052 (E01, Wed)	Molina, Mayela	2228 (Z01, Tue)
McIntyre, Melissa	1723 (I05, Tue)	Min, Byeong-Cheol	309 (A02, Wed)	Molina-Reyes, Joel	1181 (G01, Tue)
McKenzie, Eric	1857 (K02, Tue), 1859 (K02, Tue)	Min, Ji Yun	191 (A02, Mon)	Mollart, Tim	2239 (Z02, Mon)
McKinney, Samuel	1461 (I01, Thu), 1487 (I02, Sun)	Minamimoto, Hiro	880 (B07, Mon), 1470 (I01, Thu), 1610 (I03, Mon)	Möllmann, Alexander	1616 (I03, Mon)
McKinnon, Lani	2118 (M03, Thu), 2234 (Z01, Tue)	Mineta, Shingo	1019 (C01, Tue), 1023 (C01, Wed)	Molson, Corentin	489 (A04, Wed)
Mech, Krzysztof	1550 (I02, Wed)	Ming, Jun	227 (A02, Wed)	Mondal, Abhishek	256 (A02, Tue)
Meda, Lamartine	199 (A02, Mon)	Minns, Allan	1352 (H02, Wed)	Monforte, Francesca	1435 (I01, Wed)
Medina, Alyza	1860 (K02, Tue)	Minteer, Shelley	52 (A01, Tue)	Mönig, Reiner	253 (A02, Tue)
Medina, Diana Paola	933 (B08, Wed)	Minteer, Shelley	1520 (I02, Tue), 1813 (I06, Tue), 1901 (L01, Tue), 1905 (L01, Tue)	Monnier, John	1526 (I02, Tue)
Medina, Samantha	1477 (I02, Sun), 1506 (I02, Mon), 1536 (I02, Wed)	Mir, Caroline	284 (A02, Tue)	Monroe, Charles	455 (A03, Wed), 1152 (F04, Thu), 1964 (L03, Tue)
Meek, Kelly	1576 (I02, Thu), 1833 (I06, Wed)	Miranda, Jeronimo	2030 (M01, Wed)	Montes, William	2100 (M03, Wed)
Mees, Maarten	148 (A02, Mon), 285 (A02, Tue)	Miras, Haralampos	1386 (I01, Sun)	Monti, Donato	898 (B08, Tue)
Meffert, Matthias	1119 (F03, Tue)	Mirghni, Abdulmajid	614 (B01-09, Tue), 614 (B01, Tue)	Montiel, Gonzalo	609 (B01, Tue), 609 (B01-09, Tue)
Meher, Sumanta	1777 (I05, Thu)	Misawa, Hiroaki	878 (B07, Mon)	Moon, Taehwan	1178 (G01, Mon)
Mehmood, Asad	1492 (I02, Sun)	Mishra, Pratyush	1142 (F04, Wed)	Moore, Colin	1552 (I02, Wed)
Mehrabi, Hamed	989 (C01, Mon), 1584 (I03, Sun)	Mishra, Rupesh	1374 (H03, Wed)	Moore, Gary	931 (B08, Wed), 1638 (I03, Tue)
Mehrabi, Shirin	2189 (Z01, Tue)	Mishra, Vidyanshu	1391 (I01, Mon)	Moradabadi, Ashkan	1958 (L03, Tue)
Mehta, Apurva	1495 (I02, Sun), 1749 (I05, Wed)	Mishuk, Eran	2004 (M01, Tue)	Moradnia, Mina	1285 (H01, Tue)
Mehta, Mohit	347 (A02, Thu)	Misra, Durgamadhav	1167 (G01, Mon)	Morales-Acosta, Diana	1566 (I02, Wed)
Mei, Bastian	1094 (F01, Thu), 1666 (I03, Thu)	Misra, Mano	2116 (M03, Thu), 2238 (Z01, Tue)	Morales-Martinez, Roser	788 (B05, Tue), 790 (B05, Tue)
Mei, Yongfeng	1368 (H03, Wed)	Mistry, Aashutosh	149 (A02, Mon), 287 (A02, Tue), 552 (A05, Tue), 598 (A06, Wed), 1135 (F04, Wed), 1136 (F04, Wed)	Moran, Bryan	436 (A03, Tue)
Meier, Madeline	1209 (G02, Tue), 1223 (G02, Wed)	Mistry, Hemma	1500 (I02, Mon)	Moran, Peter	286 (A02, Tue), 342 (A02, Wed)
Meireles, Martine	2010 (M01, Tue)	Mitchell, James	496 (A04, Thu), 2261 (Z03, Mon)	More, Karren	1475 (I02, Sun), 1486 (I02, Sun), 1499 (I02, Mon), 1500 (I02, Mon)
Melchior, Jan-Patrick	1568 (I02, Wed)	Mitlin, David	168 (A02, Mon), 560 (A05, Tue), 655 (B01, Thu)	Moreno-Carrero, Carlos	441 (A03, Wed)
Meliane, Yasmine	1208 (G02, Tue)	Mitra, Debanjan	2200 (Z01, Tue)	Moreno-García, Pavel	1060 (E01, Wed)
Melnikova, Anna	238 (A02, Mon)	Mitsushima, Shigenori	1505 (I02, Mon)	Moreno-Grijalva, Grecia	1476 (I02, Sun)
Melo, Mauricio	887 (B07, Tue)	Mitsushima, Shigenori	1423 (I01, Tue)	Moreno-Vicente, Antonio	786 (B05, Mon), 792 (B05, Tue)
Memon, Safia	1764 (I05, Wed)	Mittal, Jeetain	721 (B03, Tue)	Morgan, Brian	157 (A02, Mon)
Mench, Matthew	437 (A03, Tue), 440 (A03, Wed), 443 (A03, Wed)	Mittelsteadt, Courtney	1816 (I06, Wed)	Mori, Yoshihiro	1183 (G01, Tue)
Méndez, V.	1566 (I02, Wed)	Miura, Hidekazu	671 (B02, Wed)	Mori, Yoshio	1043 (D01, Wed)
Mendez-Rojas, Miguel	765 (B04, Thu), 767 (B04, Thu)	Miura, Masanori	2181 (Z01, Tue)	Moriguchi, Yukihisa	355 (A02, Thu)
Mendoza Huizar, Luis	753 (B04, Tue), 753 (B01-09, Tue)			Morimitsu, Masatsugu	1421 (I01, Tue)
				Morimoto, Kota	2145 (Z01, Tue)

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Morimoto, Yu	1806 (I06, Tue)	Murkute, Pratik	994 (C01, Tue), 995 (C01, Tue), 1001 (C01, Tue)	Nam, Ki Tae	1444 (I01, Wed), 1469 (I01, Thu), 1600 (I03, Sun), 2241 (Z02, Mon)
Moriuchi, Kiyooki	401 (A03, Mon)	Murray, Ellen	846 (B06, Tue)	Nam, Sang Yong	1732 (I05, Wed), 1750 (I05, Wed)
Morris, Larry	97 (A01, Thu)	Murray, Teresa	2098 (M03, Wed), 2107 (M03, Wed)	Nam, Su-jeong	196 (A02, Mon)
Morsy, Mohamed	1922 (L01, Wed)	Murray, Teresa	2001 (M01, Mon)	Nanaji, Katchala	87 (A01, Wed)
Mortazavi, Mehdi	1538 (I02, Wed)	Murugavel Shanthi, Pavithra	48 (A01, Tue)	Nanda, Jagjit	24 (A01, Mon), 256 (A02, Tue), 291 (A02, Tue), 305 (A02, Wed), 314 (A02, Wed), 450 (A03, Wed), 451 (A03, Wed), 452 (A03, Wed), 522 (A05, Sun)
Mortensen, John	2021 (M01, Wed)	Murugesan, Vijayakumar	417 (A03, Tue)	Nanda, Karuna	1780 (I05, Thu)
Mortimer, Nicholas	412 (A03, Mon)	Mustain, William	1515 (I02, Tue), 1735 (I05, Wed), 1823 (I06, Wed), 2141 (Z01, Tue), 2142 (Z01, Tue)	Nanda, Karuna Kar	1382 (I01, Sun)
Moskovets, Eugene	2120 (M03, Thu)	Muthukumar, Sriram	2080 (M03, Tue)	Nanda, Sanjay	126 (A02, Sun)
Moss, Austen	915 (B08, Tue), 915 (B01-09, Tue)	Muthukumar, Sriram	1366 (H03, Tue), 1941 (L02, Tue), 2101 (M03, Wed), 2105 (M03, Wed)	Nanyangwe, Sylvia	1638 (I03, Tue)
Moss, Pedro	97 (A01, Thu), 98 (A01, Thu), 393 (A02, Thu)	Myers, Debbie	1462 (I01, Thu)	Nara, Hiroki	1134 (F04, Tue)
Motola, Martin	2060 (M02, Wed)	Myers, Deborah	554 (A05, Tue), 1460 (I01, Thu), 1485 (I02, Sun), 1490 (I02, Sun), 1491 (I02, Sun), 1499 (I02, Mon), 1500 (I02, Mon), 1564 (I02, Wed), 1565 (I02, Wed)	Narangari, Parvathala Reddy	1706 (I05, Mon)
Motoyama, Koichi	1055 (E01, Wed)	Myung, Seung-Taek	118 (A02, Sun), 466 (A04, Wed)	Narayanan, S.	408 (A03, Mon), 2200 (Z01, Tue)
Mottaghizadeh, Pegah	2187 (Z01, Tue)	N		Narayanan, S. R.	270 (A02, Tue)
Motz, Andrew	1390 (I01, Mon)	N'Diaye, Jeanne	643 (B01, Thu)	Narayanan, Vijay	1165 (G01, Mon)
Moulton, James	1882 (K03, Wed)	Nabulsi, Noor	1285 (H01, Tue)	Narayanasamy, Padmanathan	2117 (M03, Thu)
Mousazadehkasini, Mohammad	2089 (M03, Wed)	Naccache, Rafik	672 (B02, Wed)	Narita, Akimitsu	719 (B03, Tue)
Moy, Derek	270 (A02, Tue)	Nachtegaal, Maarten	1405 (I01, Mon)	Nariyama, Honami	447 (A03, Wed)
Moylan, Thomas	1504 (I02, Mon)	Nadimpalli, Siva	140 (A02, Sun)	Nashed, Dina	1856 (K01, Mon)
Mu, Shenglong	1715 (I05, Tue)	Nag, Joyeeta	1171 (G01, Mon)	Nasreldin, Mohamed	44 (A01, Mon)
Mueller, Caroline	1110 (F03, Tue)	Nag, Sudip	2026 (M01, Wed)	Nasu, Mitsunori	1784 (I06, Mon)
Mugo, Samuel	1364 (H03, Tue)	Nagahara, Larry	2123 (M03, Thu)	Natarajan, Aravindan	2099 (M03, Wed)
Mukaiyama, Daisaku	1106 (F03, Tue), 1107 (F03, Tue)	Nagai, Takaaki	1505 (I02, Mon)	Nath, Manashi	1411 (I01, Tue), 1642 (I03, Wed), 2038 (M01, Wed)
Mukerjee, Sanjeev	640 (B01, Wed), 1402 (I01, Mon), 1461 (I01, Thu), 1485 (I02, Sun), 1502 (I02, Mon), 1586 (I03, Sun), 1592 (I03, Sun), 1818 (I06, Wed)	Nagamatsu, Shinichi	1525 (I02, Tue)	Nath, Narayan Chandra Deb	76 (A01, Wed), 1779 (I05, Thu)
Mukerjee, Sanjeev	1384 (I01, Sun), 1394 (I01, Mon)	Nagashima, Hiroki	889 (B07, Tue)	Natividad Rangel, Reyna	2207 (Z01, Tue)
Mukherjee, Partha	149 (A02, Mon), 287 (A02, Tue), 369 (A02, Thu), 375 (A02, Thu), 552 (A05, Tue), 598 (A06, Wed), 600 (A06, Wed), 1135 (F04, Wed), 1136 (F04, Wed)	Nagasubramanian, Ganesan	551 (A05, Tue)	Naumov, Anton	617 (B01, Tue), 617 (B01-09, Tue), 663 (B01-09, Tue), 663 (B02, Tue), 665 (B02, Wed)
Mukherjee, Partha	370 (A02, Thu)	Nagayama, Tomio	2253 (Z02, Mon), 2254 (Z02, Mon)	Navaei, Milad	2120 (M03, Thu)
Mukherjee, Shreya	1681 (I04, Tue)	Naguib, Michael	147 (A02, Mon)	Navaei, Milad	2027 (M01, Wed)
Mukherjee, Soham	75 (A01, Wed)	Nagy, Géza	2268 (Z03, Mon)	Nayfeh, Ammar	1200 (G01, Wed)
Mukherjee, Subhrangsu	1235 (G03, Tue)	Nagy, Livia	2268 (Z03, Mon)	Nazaretski, Evgeny	1696 (I05, Sun)
Mukouyama, Yoshiharu	2223 (Z01, Tue), 2229 (Z01, Tue), 2230 (Z01, Tue)	Nahm, Kee Suk	201 (A02, Mon)	Nazir, Aqsa	234 (A02, Mon)
Mukundan, Rangachary	448 (A03, Wed), 1678 (I04, Tue), 1792 (I06, Mon), 1805 (I06, Tue)	Naik, Rajesh	1370 (H03, Wed)	Neale, Nathan	292 (A02, Tue), 1932 (L02, Tue)
Mul, Guido	1094 (F01, Thu), 1666 (I03, Thu)	Naik, Seema	599 (A06, Wed)	Neary, William	1571 (I02, Thu)
Mula, Raju	848 (B01-09, Tue), 848 (B06, Tue)	Naik, Tejas	2022 (M01, Wed)	Negro, Enrico	1739 (I05, Wed), 1801 (I06, Tue), 1989 (L04, Wed)
Mulet-Gas, Marc	786 (B05, Mon)	Najjar, Elie	1049 (E01, Wed)	Nehate, Shraddha	2165 (Z01, Tue), 2186 (Z01, Tue)
Müller, Christoph	416 (A03, Mon)	Nakada, Akinobu	1634 (I03, Tue)	Nejjim, Ahmed	1232 (G03, Tue)
Muller, David	1504 (I02, Mon)	Nakagawa, Milena	752 (B04, Tue), 752 (B01-09, Tue)	Nelson, Jocienne	1707 (I05, Mon)
Müller, Rafael	1992 (L04, Wed)	Nakagawa, Ryoichi	671 (B02, Wed)	Nelson, Ruben	1939 (L02, Tue)
Mullins, Charles	183 (A02, Mon), 312 (A02, Wed)	Nakagawa, Shogo	885 (B07, Tue), 1916 (L01, Wed)	Nemykin, Victor	944 (B08, Thu)
Mullins, Charles Buddie	341 (A02, Wed)	Nakahoshihara, Ryota	885 (B07, Tue)	Nerimetla, Rajasekhara	1868 (K02, Tue)
Mulmi, Suresh	2088 (M03, Wed)	Nakajima, Nami	189 (A02, Mon)	Nersisyan, Hayk	2169 (Z01, Tue), 2170 (Z01, Tue)
Muneta, Iriya	77 (A01, Wed)	Nakamoto, Tatsuichiro	2199 (Z01, Tue)	Nestler, Britta	1150 (F04, Wed), 1752 (I05, Wed)
Munje, Rujuta	2080 (M03, Tue)	Nakamura, Junji	634 (B01, Wed)	Neumann, Elizabeth	354 (A02, Thu)
Munnangi, Anji Reddy	346 (A02, Thu)	Nakamura, Susumu	2139 (Z01, Tue), 2140 (Z01, Tue)	Neumann, Ronny	1969 (L04, Mon)
Munoz, Andres	1020 (C01, Wed)	Nakamura, Takashi	2079 (M03, Tue)	Neyerlin, Ami	1576 (I02, Thu), 1833 (I06, Wed)
Muñoz Márquez, Miguel Ángel	523 (A05, Sun)	Nakamura, Tohru	1267 (H01, Mon)	Neyerlin, K.	1569 (I02, Thu), 1651 (I03, Thu)
Munoz-Sandoval, Emilio	758 (B04, Thu), 761 (B04, Thu), 767 (B04, Thu)	Nakamura, Toshihiro	2253 (Z02, Mon), 2254 (Z02, Mon)	Neyerlin, K. C.	1477 (I02, Sun), 1486 (I02, Sun), 1506 (I02, Mon), 1512 (I02, Tue), 1513 (I02, Tue)
Muradian, David	1047 (D01, Wed)	Nakamura, Yuta	2143 (Z01, Tue)	Neyerlin, Kenneth	1536 (I02, Wed)
Murakami, Hisashi	1262 (H01, Mon)	Nakanishi, Shuji	894 (B07, Tue), 2145 (Z01, Tue)	Ng, Benjamin	1515 (I02, Tue), 2142 (Z01, Tue)
Murakami, Takuro	853 (B07, Sun)	Nakao, Hidenobu	1567 (I02, Wed), 1577 (I02, Thu)	Ng, Kok Long	74 (A01, Wed), 345 (A02, Thu)
Murakoshi, Kei	880 (B07, Mon), 1470 (I01, Thu), 1610 (I03, Mon)	Nakashima, Naotoshi	703 (B03, Mon), 732 (B03, Tue), 732 (B01-09, Tue)	Ng, Siowwoon	837 (B06, Tue), 2060 (M02, Wed)
Murali, Advait	408 (A03, Mon)	Naldoni, Alberto	1607 (I03, Mon), 1667 (I03, Thu)	Ng, Tse Nga	1237 (G03, Tue), 1374 (H03, Wed)
Muramutsa, Florent	817 (B06, Mon), 2086 (M03, Wed)	Nale, Angeloaudio	1739 (I05, Wed), 1801 (I06, Tue), 1989 (L04, Wed)	Ngaboyamahina, Edgar	1880 (K03, Wed)
Murapaka, Chandrasekar	2036 (M01, Wed)	Nam, Changwoo	1889 (L01, Mon)	Ngandjong, Alain	378 (A02, Thu)
Murat, Pavel	1352 (H02, Wed)	Nam, Do-Hwan	57 (A01, Tue)	Ngo, Chilan	1441 (I01, Wed)
Murata, Mitsuhiro	285 (A02, Tue)	Nam, Jae Seok	2132 (Z01, Tue)	Ngo, Ngan	1002 (C01, Tue)
Murata, Yasujiro	773 (B05, Mon)			Ngo, Ngan	1018 (C01, Tue)
Murbach, Matthew	1154 (F04, Thu)			Ngoepe, Phuti	29 (A01, Mon)
Muresan, Rebeca	710 (B03, Mon)			Nguyen, Han	1772 (I05, Thu)
				Nguyen, Hoa Thi	548 (A05, Mon)
				Nguyen, Hoang Bao Long	468 (A04, Wed), 544 (A05, Mon)

Author Index

Author	Abs No.
Nguyen, Hung Tran	548 (A05, Mon)
Nguyen, Ngoc Anh	1393 (I01, Mon)
Nguyen, Ngoc-Anh	1397 (I01, Mon), 1446 (I01, Wed), 1449 (I01, Wed), 1450 (I01, Wed)
Nguyen, Tan	2144 (Z01, Tue)
Nguyen, Trung	429 (A03, Tue)
Nguyen, Trung	221 (A02, Mon)
Nguyen, Van Tu	548 (A05, Mon)
Nguyen, Van-Toan	1393 (I01, Mon), 1397 (I01, Mon), 1446 (I01, Wed), 1449 (I01, Wed), 1450 (I01, Wed)
Nguyen, Đàng Thành	1444 (I01, Wed)
Nguyen Van Nhien, Albert	151 (A02, Mon)
Nguyen-Phan, Thuy-Duong	1996 (L04, Wed)
Nie, Zimin	417 (A03, Tue)
Nie, Ziyang	519 (A05, Sun)
Niida, Asako	325 (A02, Wed)
Niidome, Yoshiaki	697 (B03, Mon)
Nilsen-Hamilton, Marit	1895 (L01, Mon)
Ning, Fei	996 (C01, Tue), 997 (C01, Tue), 1022 (C01, Wed), 1027 (C01, Wed), 1028 (C01, Wed), 1029 (C01, Wed)
Nirmalchandar, Archith	408 (A03, Mon)
Niroula, Jinesh	1839 (K01, Mon), 1874 (K03, Wed), 1882 (K03, Wed)
Nishida, Jin	703 (B03, Mon)
Nishida, Tetsuaki	2149 (Z01, Tue)
Nishihara, Kaho	325 (A02, Wed)
Nishikata, Atsushi	974 (C01, Mon), 975 (C01, Mon), 2159 (Z01, Tue)
Nishimura, Takashi	2229 (Z01, Tue)
Nishimura, Toshiyuki	1567 (I02, Wed)
Nishioka, Kiho	2145 (Z01, Tue)
Nishitani, Shoichi	1302 (H02, Mon)
Nitta, Akio	1628 (I03, Tue), 2057 (M02, Wed)
Niu, Chaojiang	132 (A02, Sun), 531 (A05, Mon)
Niu, Chuang	772 (B05, Mon)
Niu, Junjie	164 (A02, Mon)
Niu, Sibao	203 (A02, Mon)
Niwa, Etsuko	1493 (I02, Sun)
Niwa, Ryosuke	1217 (G02, Tue)
Noda, Ayumi	143 (A02, Sun)
Noguchi, Hidenori	2064 (M02, Wed)
Noguchi, Naoto	1043 (D01, Wed)
Nogueira, Francisco	1288 (H01, Tue), 2250 (Z02, Mon)
Noh, Jinhyun	1270 (H01, Mon)
Noh, Yuseong	218 (A02, Mon)
Nohira, Toshiyuki	2247 (Z02, Mon)
Nojoomi, Amirali	679 (B02, Thu)
Nolis, Gene	386 (A02, Thu)
Nomoto, Kazuki	1267 (H01, Mon)
Nomura, Fumihiko	2138 (Z01, Tue)
Noori, Jafar	2021 (M01, Wed)
Norberg, Andreas	296 (A02, Wed)
Norikawa, Yutaro	2247 (Z02, Mon)
Norkus, Eugenijus	612 (B01-09, Tue), 612 (B01, Tue), 1063 (E01, Wed), 1530 (I02, Tue), 1556 (I02, Wed), 1558 (I02, Wed)
Norkus, Eugenijus	1531 (I02, Tue)
Norman, Mya	1703 (I05, Mon)
Norouzi, Nazgol	638 (B01, Wed)
Norris, Chance	287 (A02, Tue)
Northrup, Paul	536 (A05, Mon)
Nováková, Jaroslava	1447 (I01, Wed)
Novoselov, Konstantin	2120 (M03, Thu)
Novoselov, Kostya	833 (B06, Tue)
Nowakowska, Sylwia	920 (B08, Wed)
Nowakowski, Jan	920 (B08, Wed)
Nuckolls, Colin	627 (B01, Wed)
Nugen, Tyler	1859 (K02, Tue)
Nyce, Michael	61 (A01, Tue), 506 (A04, Thu)
Nziko, Vincent De Paul	1568 (I02, Wed)

O

Author	Abs No.
O'Brien, Colin	1585 (I03, Sun)
O'Neill, Mark	1032 (D01, Tue)
Oba, Tomoaki	823 (B06, Mon)
Obisesan, Olaoluwa	1876 (K03, Wed)
Obondi, Christopher	912 (B08, Tue), 912 (B01-09, Tue)
Oboroceanu, Daniela	418 (A03, Tue), 439 (A03, Wed)
Obrzut, Jan	699 (B03, Mon)
Oda, Hiroyuki	1043 (D01, Wed)
Oda, Shunri	823 (B06, Mon)
Odete, Mary Ann	1034 (D01, Tue)
Odgaard, Madeleine	1461 (I01, Thu), 1487 (I02, Sun)
Odnoblyudov, Vladimir	1274 (H01, Tue)
Odobel, Fabrice	10 (A01, Sun)
Odom, Susan	266 (A02, Tue), 457 (A03, Wed), 458 (A03, Wed), 508 (A04, Thu)
Oestli, Elise	363 (A02, Thu)
Offenhäusser, Andreas	1296 (H02, Mon)
Officer, David	928 (B08, Wed)
Ogawa, Akiko	671 (B02, Wed), 1097 (F01, Thu), 1869 (K02, Tue)
Ogawa, Shinichi	1184 (G01, Tue)
Ogini, Martins	1218 (G02, Tue), 2177 (Z01, Tue)
Ogini, Martins E.	2178 (Z01, Tue), 2183 (Z01, Tue)
Ogino, Sayaka	938 (B08, Wed)
Ogitsu, Tadashi	1389 (I01, Mon), 1467 (I01, Thu), 1627 (I03, Tue)
Ogura, Atsushi	838 (B06, Tue)
Ogura, Kazuya	885 (B07, Tue)
Oguz, Hasan	584 (A06, Tue)
Oh, Christiana	2119 (M03, Thu)
Oh, Eun-Suok	208 (A02, Mon)
Oh, Jihun	1657 (I03, Thu)
Oh, Jung Hyun	1755 (I05, Wed), 1756 (I05, Wed), 1762 (I05, Wed)
Oh, Mi Young	201 (A02, Mon)
Oh, SeKwon	1456 (I01, Wed)
Oh, Seung Kyu	1285 (H01, Tue)
Ohama, Ayano	325 (A02, Wed)
Ohira, Akihiro	1577 (I02, Thu)
Ohki, Shota	1019 (C01, Tue), 1023 (C01, Wed)
Ohkubo, Taichi	2143 (Z01, Tue)
Ohmi, Shun-ichiro	1181 (G01, Tue), 1996 (L04, Wed), 2015 (M01, Tue), 2016 (M01, Tue), 2017 (M01, Tue), 2024 (M01, Wed), 2028 (M01, Wed)
Ohsaka, Hiroki	2230 (Z01, Tue)
Ohsaka, Takeo	2138 (Z01, Tue), 2139 (Z01, Tue), 2140 (Z01, Tue)
Ohta, Toshiyuki	1842 (K01, Mon)
Ohtani, Bunsho	886 (B07, Tue), 1628 (I03, Tue), 2057 (M02, Wed)
Oizumi, Atsuya	1097 (F01, Thu)
Ojobe, Bukola	2213 (Z01, Tue)
Oka, Nobuto	2149 (Z01, Tue)
Okada, Haruki	2229 (Z01, Tue)
Okada, Naoya	1184 (G01, Tue)
Okada, Shigeto	381 (A02, Thu), 2149 (Z01, Tue)
Okada, Yoshitaka	1230 (G02, Wed)
Okada, Yuka	447 (A03, Wed)
Okagaki, Jun	1890 (L01, Mon)
Okano, Hiroshi	2143 (Z01, Tue)
Okasinski, John	535 (A05, Mon)
Okazaki, Masahiro	1609 (I03, Mon)
Okazaki, Megumi	1649 (I03, Thu)
Okazaki, Toshiya	673 (B02, Thu)
Okerberg, Brian	1079 (F01, Wed)
Okido, Masazumi	1088 (F01, Wed)
Okiei, Wesley	2213 (Z01, Tue)
Oktyabrsky, Serge	1352 (H02, Wed)
Okuda-Shimazaki, Junko	2227 (Z01, Tue)

Author	Abs No.
Okuda-Shimazaki, Junko	1935 (L02, Tue)
Okura, Kaname	2253 (Z02, Mon)
Olasunkanmi, Lukman	1006 (C01, Tue), 1007 (C01, Tue)
Olchowka, Jacob	468 (A04, Wed)
Oleksak, Richard	1000 (C01, Tue)
Oliveira, Francilio	754 (B04, Tue), 754 (B01-09, Tue)
Oliveira, Jéssica	1288 (H01, Tue)
Olmstead, Marilyn	768 (B05, Mon), 769 (B05, Mon)
Olsen, Timothy	2121 (M03, Thu)
Olson, David	804 (B06, Sun), 1171 (G01, Mon), 1281 (H01, Tue)
Omirkhan, Aigerim	986 (C01, Mon)
Omosebi, Ayokunle	1104 (F03, Tue)
Onabuta, Yusuke	1127 (F04, Tue)
Ong, Shyue Ping	1772 (I05, Thu)
Ooi, Azusa	974 (C01, Mon), 975 (C01, Mon), 2159 (Z01, Tue)
Oppeneer, Peter	920 (B08, Wed)
Orcin-Chaix, Lucile	719 (B03, Tue)
Orellana, Walter	763 (B04, Thu)
Orfanidi, Alin	1793 (I06, Mon)
Oriňáková, Renáta	1933 (L02, Tue)
Orlando, Joseph	1354 (H03, Tue)
Oropeza-Guzman, Mercedes	1476 (I02, Sun)
Orozco Gamboa, German	1984 (L04, Tue)
Ortiz Vitoriano, Nagore	553 (A05, Tue)
Osaka, Tetsuya	1134 (F04, Tue)
Osenberg, Markus	539 (A05, Mon)
Oskam, Gerko	2054 (M02, Wed)
Osmieri, Luigi	1486 (I02, Sun), 1506 (I02, Mon), 1512 (I02, Tue), 1513 (I02, Tue)
Osterloh, Frank	887 (B07, Tue), 2056 (M02, Wed)
Osterloh, Ryan	901 (B08, Tue), 951 (B08, Thu)
Ostroverkh, Anna	1447 (I01, Wed)
Ota, Ken-ichiro	1423 (I01, Tue)
Ota, Kengo	974 (C01, Mon)
Ota, Kenichiro	1505 (I02, Mon)
Otani, Minoru	1952 (L03, Mon)
Oteo, Uxue	153 (A02, Mon)
Otsuka, Keigo	741 (B03, Wed)
Ott, John	1165 (G01, Mon)
Ott, Sascha	2224 (Z01, Tue)
Offen, Alex	1855 (K01, Mon)
Ou, Pengfei	809 (B06, Sun), 1960 (L03, Tue)
Ou Yang, Liang-Yueh	1123 (F04, Tue)
Ouimet, Ryan	1532 (I02, Wed)
Outlaw, Ronald	2155 (Z01, Tue)
Ouyang, Minggao	530 (A05, Mon), 568 (A06, Mon), 579 (A06, Tue), 581 (A06, Tue), 582 (A06, Tue), 585 (A06, Tue), 588 (A06, Tue), 590 (A06, Tue), 593 (A06, Tue)
Ouyang, Zi	283 (A02, Tue)
Owczarczyk, Zbyslaw	1576 (I02, Thu), 1827 (I06, Wed), 1833 (I06, Wed)
Oyanagi, Yuya	838 (B06, Tue)
Oyedotun, Kabir	614 (B01-09, Tue), 614 (B01, Tue), 654 (B01, Thu)
Oyekunle, John A. O.	1876 (K03, Wed)
Ozbek, Sebnem	1039 (D01, Tue)
Ozden, Sehmus	810 (B06, Sun), 1678 (I04, Tue)
Ozigagu, Christopher	1026 (C01, Wed)
Ozkan, Cengiz	592 (A06, Tue)
Ozkan, Mihri	592 (A06, Tue)
Ozouf, Guillaume	1972 (L04, Mon)

P

Pace, Giuseppe	1739 (I05, Wed), 1801 (I06, Tue)
Pace, Gordon	72 (A01, Wed)
Packirisamy, M.	2074 (M03, Tue)
Pacquette, Adele	58 (A01, Tue)
Padash, Fardin	1079 (F01, Wed)

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Paddison, Stephen	1745 (I05, Wed), 1815 (I06, Wed), 1957 (L03, Tue)	Park, Hyunwoong	1653 (I03, Thu), 1779 (I05, Thu)	Pati, Soobhankar	247 (A02, Tue), 1482 (I02, Sun)
Padgett, Elliot	1504 (I02, Mon)	Park, Hyunyoung	465 (A04, Wed), 466 (A04, Wed)	Patil, Kailash	1424 (I01, Tue)
Page, Miles	1829 (I06, Wed)	Park, Jae Hyun	323 (A02, Wed), 2133 (Z01, Tue), 2152 (Z01, Tue), 2197 (Z01, Tue)	Patil, Satish	75 (A01, Wed), 419 (A03, Tue)
Page, Miles	1830 (I06, Wed)	Park, Jaehyung	1490 (I02, Sun), 1491 (I02, Sun), 1499 (I02, Mon), 1500 (I02, Mon), 1564 (I02, Wed)	Patil, Satish	449 (A03, Wed)
Pagot, Gioele	1739 (I05, Wed), 1801 (I06, Tue), 1989 (L04, Wed)	Park, Jea-Gun	882 (B07, Tue), 1166 (G01, Mon), 1169 (G01, Mon), 1170 (G01, Mon), 1284 (H01, Tue)	Patkar, Rajul	2022 (M01, Wed)
Pai, Rahul	280 (A02, Tue), 503 (A04, Thu)	Park, Jin-Seong	1284 (H01, Tue)	Patolsky, Fernando	300 (A02, Wed)
Paik, Hanjong	1707 (I05, Mon)	Park, Jinho	1684 (I04, Tue)	Patwardhan, Siddarthh	295 (A02, Wed)
Pailleret, Alain	2125 (M03, Thu)	Park, Jong Goo	861 (B07, Sun)	Patzke, Greta	1992 (L04, Wed)
Paiva, Robert	611 (B01, Tue), 611 (B01-09, Tue)	Park, Jong Hyeok	1597 (I03, Sun)	Pavithra, Chokkakula	2036 (M01, Wed)
Paixao, Marcio	611 (B01, Tue), 611 (B01-09, Tue)	Park, Jong Seon	1645 (I03, Wed), 1760 (I05, Wed)	Pavlov, Michael	1054 (E01, Wed)
Pak, Chanho	1440 (I01, Wed), 2201 (Z01, Tue)	Park, Jong Seon	1760 (I05, Wed)	Pavlova, Ksenia	1860 (K02, Tue), 2219 (Z01, Tue)
Pakštas, Vidas	612 (B01, Tue), 612 (B01-09, Tue), 1558 (I02, Wed)	Park, Jonghyun	49 (A01, Tue), 104 (A01, Thu), 310 (A02, Wed), 657 (B01, Thu), 1160 (F04, Thu), 1161 (F04, Thu)	Payne, Daniel	937 (B08, Wed)
Pal, Uday	1724 (I05, Tue)	Park, Jonghyun	216 (A02, Mon), 308 (A02, Wed), 434 (A03, Tue)	Payoyo, Jeanne	1534 (I02, Wed)
Pala, Raj	90 (A01, Wed), 2148 (Z01, Tue)	Park, Joo-Hyeong	882 (B07, Tue)	Pearton, Stephen	1261 (H01, Mon), 1264 (H01, Mon), 1268 (H01, Mon), 1269 (H01, Mon), 2082 (M03, Tue)
Palacios-Padros, Anna	518 (A05, Sun)	Park, Joon Hui	2040 (M01, Wed)	Peczonczyk, Sabrina	526 (A05, Sun)
Palakurthi, Harish	2013 (M01, Tue)	Park, Joonam	194 (A02, Mon), 214 (A02, Mon)	Peebles, Cameron	160 (A02, Mon)
Pallares, Josep	1234 (G03, Tue)	Park, Juhong	26 (A01, Mon), 849 (B06, Tue), 849 (B01-09, Tue), 1121 (F03, Tue)	Pekarek, Ryan	1932 (L02, Tue)
Pallares, Josep	1338 (H02, Wed)	Park, Jun-Young	1454 (I01, Wed)	Peled, Emanuel	486 (A04, Wed)
Palma, Matteo	689 (B02, Thu), 749 (B03, Wed)	Park, Kang-Joon	223 (A02, Mon)	Peled, Emanuel	300 (A02, Wed)
Palomar-Pardavé, Manuel	750 (B01-09, Tue), 750 (B04, Tue)	Park, Kimoon	1056 (E01, Wed)	Pellegrin, Yann	10 (A01, Sun)
Pan, Fu-Ming	2025 (M01, Wed)	Park, Min-Sik	215 (A02, Mon), 219 (A02, Mon), 2130 (Z01, Tue), 2131 (Z01, Tue)	Pellerin, Lisa	534 (A05, Mon)
Pan, Huilin	379 (A02, Thu)	Park, Minkyu	65 (A01, Tue)	Pender, Joshua	341 (A02, Wed)
Pan, Mu	2202 (Z01, Tue)	Park, Miseok	1179 (G01, Mon)	Peng, Jing	432 (A03, Tue)
Pan, Tung	2033 (M01, Wed), 2034 (M01, Wed), 2035 (M01, Wed)	Park, Myung-Soo	192 (A02, Mon)	Peng, Wei	1761 (I05, Wed)
Pan, Xiaona	594 (A06, Tue)	Park, Sang-Jun	196 (A02, Mon)	Peng, Xiong	1735 (I05, Wed), 1823 (I06, Wed)
Pan, Xiaoqing	1700 (I05, Mon)	Park, Sangho	1483 (I02, Sun)	Peracchio, Aldo	1736 (I05, Wed)
Pan, Yue	590 (A06, Tue)	Park, Sei Jin	708 (B03, Mon)	Peralta, David	357 (A02, Thu)
Panahi, Zahra	1872 (K03, Wed)	Park, Seok-Hee	1542 (I02, Wed)	Percival, Stephen	454 (A03, Wed)
Panangala, Samitha	659 (B01, Thu), 2151 (Z01, Tue)	Park, Seok-Joo	1765 (I05, Wed)	Perebeinos, Vasili	821 (B06, Mon)
Panat, Rahul	104 (A01, Thu)	Park, Seong-Jin	222 (A02, Mon)	Pereira, Drew	293 (A02, Tue)
Pandey, Gaiind	199 (A02, Mon)	Park, Seongmin	1751 (I05, Wed)	Pereira, Ernesto	611 (B01-09, Tue), 611 (B01, Tue)
Pandhi, Twinkle	817 (B06, Mon), 2086 (M03, Wed)	Park, So Min	857 (B07, Sun)	Perera, Rajitha	907 (B08, Tue), 907 (B01-09, Tue)
Pann, Serge	1461 (I01, Thu)	Park, Subin	631 (B01, Wed)	Peretti, Amanda	454 (A03, Wed)
Pantheni, Dhruba	1716 (I05, Tue)	Park, Suk Won	1755 (I05, Wed)	Perez, Carlos	2008 (M01, Tue)
Panthi, Yadu Ram	1251 (G03, Wed)	Park, Sung	2195 (Z01, Tue)	Perez, Emilio	713 (B03, Tue)
Panzeri, Gabriele	406 (A03, Mon)	Park, Sung-Guk	193 (A02, Mon)	Perez, Maximiliano	2103 (M03, Wed)
Pao, Yu-Ping	1315 (H02, Mon)	Park, Sunggak	1444 (I01, Wed), 1469 (I01, Thu)	Perez-Andrade, Jonathan	767 (B04, Thu)
Paolella, Andrea	272 (A02, Tue)	Park, Sungjun	2092 (M03, Wed)	Perez-Beltran, Saul	279 (A02, Tue)
Paollesse, Roberto	898 (B08, Tue)	Park, Tae Hyun	2176 (Z01, Tue)	Perry, Mike	435 (A03, Tue), 1812 (I06, Tue)
Paoli, Roberto	603 (A06, Wed)	Parke, Brenna	1907 (L01, Tue)	Persson, Kristin	350 (A02, Thu), 351 (A02, Thu), 360 (A02, Thu)
Papageorgopoulos, Dimitrios	1820 (I06, Wed)	Parke, Caitlin	1157 (F04, Thu), 1159 (F04, Thu)	Perticarari, Sofia	10 (A01, Sun)
Papalia, John	58 (A01, Tue)	Parker, Joseph	383 (A02, Thu), 1769 (I05, Thu), 2147 (Z01, Tue)	Perumaram Rangarajan, Sobana	369 (A02, Thu), 552 (A05, Tue)
Papp, Joseph	307 (A02, Wed)	Parkinson, Bruce	2065 (M02, Wed)	Perumaram Rangarajan, Sobana	370 (A02, Thu)
Paranthaman, Mariappan	20 (A01, Mon), 22 (A01, Mon), 248 (A02, Tue), 264 (A02, Tue)	Parnian, Javad	1808 (I06, Tue)	Petaccia, Luca	852 (B01-09, Tue), 852 (B06, Tue)
Parent, Benjamin	1571 (I02, Thu)	Parr, Daniel	1359 (H03, Tue), 1907 (L01, Tue)	Peter, Sebastian	1391 (I01, Mon)
Parette, David	2226 (Z01, Tue)	Parrondo, Javier	1821 (I06, Wed)	Peters, Dennis	1858 (K02, Tue), 1871 (K02, Tue), 1102 (F02, Mon), 1857 (K02, Tue), 1859 (K02, Tue), 1863 (K02, Tue), 1881 (K03, Wed)
Parida, Shayani	1699 (I05, Mon)	Pasebani, Somayeh	994 (C01, Tue)	Peters, Dennis	1102 (F02, Mon), 1857 (K02, Tue), 1859 (K02, Tue), 1863 (K02, Tue), 1881 (K03, Wed)
Park, Beom-Kyeong	1719 (I05, Tue)	Pasta, Mauro	380 (A02, Thu)	Peterson, David	1389 (I01, Mon), 1820 (I06, Wed)
Park, Bumjun	542 (A05, Mon)	Patel, Anish	607 (A06, Wed)	Petla, Ramesh Kumar	244 (A02, Mon)
Park, Chan-Jin	230 (A02, Mon), 231 (A02, Mon), 232 (A02, Mon), 233 (A02, Mon), 234 (A02, Mon)	Patel, Anisha	561 (A05, Tue)	Petrash, Stanislas	1003 (C01, Tue)
Park, Cheolho	255 (A02, Tue)	Patel, Anjali	1428 (I01, Wed)	Petrikov, Sergey	1850 (K01, Mon), 1851 (K01, Mon)
Park, Cheolmin	1306 (H02, Mon), 2176 (Z01, Tue), 2184 (Z01, Tue), 2235 (Z01, Tue)	Patel, Dhruv	52 (A01, Tue)	Petrucco, Enrico	518 (A05, Sun)
Park, Chong-Yun	619 (B01, Tue), 619 (B01-09, Tue), 851 (B01-09, Tue), 851 (B06, Tue)	Patel, Hetal	1699 (I05, Mon)	Peurifoy, Samuel	627 (B01, Wed)
Park, Eun Joo	448 (A03, Wed), 1575 (I02, Thu)	Paterson, Alisa	496 (A04, Thu)	Pfeifer, Claudia	181 (A02, Mon)
Park, Gumjae	414 (A03, Mon)	Pathak, Anil	247 (A02, Tue)	Pfeilsticker, Jason	1536 (I02, Wed)
Park, Hee Sung	1754 (I05, Wed)	Pathak, Chintan	1129 (F04, Tue), 1156 (F04, Thu)	Pflegler, Jiri	1251 (G03, Wed)
Park, Hyeon Woo	1178 (G01, Mon)	Pathak, Manan	106 (A01, Thu), 1129 (F04, Tue), 1157 (F04, Thu)	Pham, Hiep	49 (A01, Tue), 657 (B01, Thu)
Park, Hyeong-Il	255 (A02, Tue)	Pathak, Manan	372 (A02, Thu), 1154 (F04, Thu), 1159 (F04, Thu)	Pham, Hieu	1961 (L03, Tue)
Park, Hyun S.	2256 (Z03, Mon)	Pathak, Pravin	941 (B08, Thu)	Pham, Hieu Quang	333 (A02, Wed)
Park, Hyungsoon	1035 (D01, Tue)	Pathak, Rajesh	471 (A04, Wed), 2146 (Z01, Tue)	Pham, Patricia	2124 (M03, Thu)
Park, Hyunik	811 (B06, Sun), 1291 (H01, Wed)			Pham, Tammy	1861 (K02, Tue)

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Philip, Maria	158 (A02, Mon)	Prasad, Shalini	1366 (H03, Tue), 1940 (L02, Tue), 2051 (M01, Wed)	Raeissi, Keyvan	998 (C01, Tue)
Philips, Laura	1034 (D01, Tue)	Prasannachandran, Ranjith	1409 (I01, Tue)	Rafie, Ayda	503 (A04, Thu)
Phillip, Nathan	314 (A02, Wed), 335 (A02, Wed)	Prashant, Acharya	1426 (I01, Tue)	Rafie, Ayda	114 (A02, Sun)
Piana, Michele	559 (A05, Tue)	Prato, Maurizio	667 (B02, Wed), 692 (B03, Mon)	Rafie, Mohammad	1866 (K02, Tue)
Piao, Yuanzhe	30 (A01, Mon), 289 (A02, Tue)	Prébé, Arnaud	68 (A01, Tue), 489 (A04, Wed)	Rafou, Lily	1861 (K02, Tue)
Picard, Lionel	1571 (I02, Thu)	Preble, Stefan	1216 (G02, Tue)	Ragone, Marco	1148 (F04, Wed)
Pichler, Thomas	716 (B03, Tue)	Preger, Yuliya	569 (A06, Mon), 605 (A06, Wed)	Ragone, Marco	603 (A06, Wed), 606 (A06, Wed)
Picos, Rodrigo	1243 (G03, Tue)	Premaratne, Gayan	1839 (K01, Mon), 1868 (K02, Tue), 1874 (K03, Wed), 1882 (K03, Wed), 2095 (M03, Wed)	Rahe, Christiane	549 (A05, Mon), 562 (A05, Tue)
Pierce, Michael	1887 (L01, Mon)	Premathilake, Dilshan	2155 (Z01, Tue)	Rahman, MD Azimur	2190 (Z01, Tue), 2193 (Z01, Tue)
Pierce, Richard	2000 (M01, Mon)	Premkumar, Anjali	1212 (G02, Tue)	Rahman, Muhammad Mominur	139 (A02, Sun), 469 (A04, Wed)
Piernas-Muñoz, María José	254 (A02, Tue), 258 (A02, Tue)	Prévost, Sylvain	541 (A05, Mon)	Rais, David	1251 (G03, Wed)
Pigos, Elena	396 (A02, Thu)	Prikryl, Jan	837 (B06, Tue), 2060 (M02, Wed)	Raj, Abhi	531 (A05, Mon)
Pigos, John	1070 (F01, Wed)	Primbs, Mathias	1492 (I02, Sun)	Raja, Duraisamy	1418 (I01, Tue)
Pinals, Rebecca	683 (B02, Thu)	Primo, Emiliano	378 (A02, Thu)	Rajagopal, Rajesh	39 (A01, Mon)
Ping, Yuan	1467 (I01, Thu)	Prisbrey, Keith	2234 (Z01, Tue)	Rajagopalan Kannan, Dhevathi Rajan	98 (A01, Thu), 393 (A02, Thu)
Pintauro, Peter	256 (A02, Tue)	Prithi, J. A.	1484 (I02, Sun)	Rajalakshmi, Natarajan	1484 (I02, Sun)
Pintauro, Peter	1731 (I05, Wed), 1821 (I06, Wed)	Pritzl, Daniel	146 (A02, Sun)	Rajeshwar, Krishnan	1210 (G02, Tue), 1601 (I03, Sun), 1648 (I03, Wed), 1665 (I03, Thu), 2067 (M02, Wed)
Piraman, Shakkthivel	365 (A02, Thu)	Privitera, Stefania	1435 (I01, Wed)	Rajewski, Andrew	412 (A03, Mon)
Piszc, Michal	153 (A02, Mon)	Priya, Pikee	1145 (F04, Wed)	Rakibuddin, Md	2212 (Z01, Tue)
Pitman, Catherine	1518 (I02, Tue)	Proietto, Federica	1070 (F01, Wed)	Rakibuddin, MD	881 (B07, Tue), 960 (B09, Wed)
Pivovar, Bryan	1422 (I01, Tue), 1437 (I01, Wed), 1576 (I02, Thu), 1827 (I06, Wed), 1833 (I06, Wed)	Proshlyakov, Denis	939 (B08, Thu)	Rakotoarimanana, Patie Cendra	1206 (G02, Tue)
Plata, Desirée	67 (A01, Tue), 95 (A01, Thu)	Proshchkina, Tatyana	236 (A02, Mon)	Rakshit, Subhajit	140 (A02, Sun)
Plateau, Tazdik Patwary	657 (B01, Thu)	Proust, Anna	1990 (L04, Wed)	Ramadurai, Ranjith	2037 (M01, Wed)
Plews, Andrew	1232 (G03, Tue)	Pruefer, Jakob	1238 (G03, Tue)	Ramalinga, Bandi	48 (A01, Tue)
Plichta, Edward	270 (A02, Tue)	Pruski, Marek	501 (A04, Thu)	Ramani, Vijay	431 (A03, Tue)
Ploszajski, Anna	386 (A02, Thu)	Pu, Haihui	1300 (H02, Mon)	Ramanujam, Kothandaraman	1747 (I05, Wed)
Po, Chi-Chao	1371 (H03, Wed)	Pu, Jian	33 (A01, Mon), 220 (A02, Mon)	Ramasamy, Ramaraja	2070 (M03, Tue)
Poblet, Josep M.	786 (B05, Mon), 787 (B05, Mon), 788 (B05, Tue), 790 (B05, Tue), 792 (B05, Tue)	Puckett, Madalyn	2194 (Z01, Tue)	Ramauskas, Lukas	1873 (K03, Wed)
Poddutoori, Prashanth	948 (B08, Thu)	Pulikkathodi, Anil	1301 (H02, Mon), 1309 (H02, Mon)	Ramasubramanian, Ajaykrishna	603 (A06, Wed), 606 (A06, Wed)
Podlaha, Elizabeth	1395 (I01, Mon)	Pullerits, Tõnu	1661 (I03, Thu)	Ramesh, Govindarajan	2237 (Z01, Tue)
Podlaha, Elizabeth	2203 (Z01, Tue)	Pupek, Krzysztof	258 (A02, Tue)	Ramirez Silva, María Teresa	2207 (Z01, Tue)
Poelt, Peter	1114 (F03, Tue), 1115 (F03, Tue)	Purdy, Andrew	1991 (L04, Wed)	Ramos-Sánchez, Guadalupe	116 (A02, Sun)
Pognon, Grégory	91 (A01, Wed)	Put, Brecht	148 (A02, Mon), 285 (A02, Tue)	Ramuz, Marc	245 (A02, Mon), 1373 (H03, Wed)
Poizot, Philippe	10 (A01, Sun)	Pylypenko, Svitlana	1422 (I01, Tue), 1441 (I01, Wed), 1477 (I02, Sun)	Rana, Muhit	1852 (K01, Mon), 2000 (M01, Mon), 2094 (M03, Wed)
Pol, Laura	1338 (H02, Wed)	Pylypenko, Svitlana	1506 (I02, Mon), 1536 (I02, Wed)	Ranaweera, Ruchiranga	1436 (I01, Wed), 2264 (Z03, Mon)
Pol, Vilas	16 (A01, Mon)			Randall, Corey	1740 (I05, Wed)
Policastro, Steve	976 (C01, Mon)	Q		Randjbar Daemi, Sohrab	518 (A05, Sun), 543 (A05, Mon)
Pollack, Daniel	407 (A03, Mon)	Qi, Yongzhen	1831 (I06, Wed)	Randolph, Katie	1389 (I01, Mon)
Pollen, Harald	211 (A02, Mon)	Qi, Yue	1131 (F04, Tue)	Ranga Rao, G.	1484 (I02, Sun)
Polzin, Bryant	25 (A01, Mon), 368 (A02, Thu), 534 (A05, Mon)	Qi, ZhenBang	1580 (I03, Sun)	Rangarajan, Venkatesan	2099 (M03, Wed)
Ponce, Victor	156 (A02, Mon)	Qianxiang, Ai	1591 (I03, Sun)	Rangel, Reyna	2228 (Z01, Tue)
Ponnuswamy, Thomas	1125 (F04, Tue)	Qiao, Jinli	1646 (I03, Wed), 1746 (I05, Wed), 1748 (I05, Wed), 1773 (I05, Thu)	Rangel-Mendez, José	762 (B04, Thu), 2245 (Z02, Mon)
Poon, Po	755 (B04, Thu)	Qiao, Lin	2134 (Z01, Tue)	Ranjan, Alok	1293 (H01, Wed)
Poozhikunnath, Abhinav	1549 (I02, Wed)	Qiao, Qiquan	471 (A04, Wed)	Rannou, Patrice	1571 (I02, Thu)
Popczun, Eric	1996 (L04, Wed)	Qiao, Qiquan	2146 (Z01, Tue)	Rao, Pratap	1596 (I03, Sun)
Popov, Alexey	770 (B05, Mon), 785 (B05, Mon)	Qiao, Xiaoyao	73 (A01, Wed), 96 (A01, Thu)	Rao, Tata	87 (A01, Wed)
Popovs, Ilja	1568 (I02, Wed)	Qiao, Zhi	1802 (I06, Tue)	Rao, Yan	2202 (Z01, Tue)
Porath, Anthony	413 (A03, Mon)	Qin, Bin	428 (A03, Tue)	Rasha, Lara	1473 (I02, Sun)
Porfyarakis, Kyriakos	779 (B05, Mon)	Qin, Xueping	1401 (I01, Mon), 1656 (I03, Thu)	Rastogi, Sahil	666 (B02, Wed)
Porter, Jason	520 (A05, Sun), 580 (A06, Tue)	Qin, Yan	646 (B01, Thu)	Ratautas, Dalius	1873 (K03, Wed)
Potskhveriya, Mikhail	1850 (K01, Mon)	Qin, Yeshen	925 (B08, Wed)	Rathi, Pinki	904 (B08, Tue)
Pouget, Stéphanie	540 (A05, Mon)	Qiu, Kaipei	2257 (Z03, Mon)	Ratnakar, Ram	1130 (F04, Tue)
Pouladi, Sara	1285 (H01, Tue)	Qu, Haoran	733 (B03, Tue), 733 (B01-09, Tue)	Ratnakumar, Bugga	177 (A02, Mon)
Povia, Mauro	1405 (I01, Mon)	Quesada, Sergio	805 (B06, Sun)	Rau, Martin	1182 (G01, Tue)
Powell, Christianna	2251 (Z02, Mon)	Quezada Renteria, Javier	762 (B04, Thu)	Ravel, Bruce	1003 (C01, Tue)
Powers, Devon	1731 (I05, Wed), 1821 (I06, Wed)	Quill, Nathan	418 (A03, Tue), 439 (A03, Wed)	Ravichandran, Aravind	245 (A02, Mon), 1373 (H03, Wed)
Pozzo, Lilo	453 (A03, Wed)	Quinlan, Ronald	2155 (Z01, Tue)	Ravikumar, Musuwathi	419 (A03, Tue)
Prabhudev, Sagar	1978 (L04, Tue)			Rawal, Saurin Hiren	1768 (I05, Thu)
Prada Silvy, Ricardo	957 (B09, Wed)			Ray, Asim	1245 (G03, Wed)
Prajapati, Aditya	1675 (I04, Tue)			Ray, Suman	449 (A03, Wed)
Prakash, Kamal	951 (B08, Thu)			Raynaud, Christophe	743 (B03, Wed)
Prakash, Raju	492 (A04, Wed)			Razal, Joselito	1378 (H03, Wed)
Pralong, Valerie	121 (A02, Sun)			Razauulla, Talha	9 (A01, Sun)
Pramounmat, Nuttanut	1837 (K01, Mon), 2206 (Z01, Tue)			Razeeb, Kafil	2117 (M03, Thu)
Prasad, Ankush	1845 (K01, Mon), 1846 (K01, Mon), 1854 (K01, Mon)				
Prasad, Shalini	1941 (L02, Tue), 2080 (M03, Tue), 2101 (M03, Wed), 2105 (M03, Wed), 2111 (M03, Wed)				

Author Index

Author.....	Abs No.	Author.....	Abs No.	Author.....	Abs No.
Razumiene, Julija.....	1096 (F01, Thu)	Rim, You Seung.....	2040 (M01, Wed)	Rowley-Neale, Samuel.....	1407 (I01, Tue)
Razzino, Claudia.....	756 (B04, Thu)	Ringel, Steven.....	1263 (H01, Mon)	Roxbury, Daniel.....	685 (B02, Thu), 691 (B02, Thu),694 (B03, Mon), 721 (B03, Tue)
Reale, Erik.....	1108 (F03, Tue)	Risch, Marcel.....	1660 (I03, Thu)	Roy, Aaron.....	1492 (I02, Sun)
Rebeyre, Grégoire.....	719 (B03, Tue)	Risko, Chad.....	1591 (I03, Sun)	Roy, Dipankar.....	1040 (D01, Tue)
Redel, Engelbert.....	1252 (G03, Wed)	Risse, Sebastian.....	541 (A05, Mon)	Roy, Indroneil.....	1205 (G02, Tue)
Redfield, Daniel.....	1046 (D01, Wed)	Ritzert, Nicole.....	1051 (E01, Wed)	Roy, Mrittika.....	769 (B05, Mon)
Redinger, Lawrence.....	2013 (M01, Tue)	Rivera, Jose.....	1984 (L04, Tue)	Roy, Soumyabrata.....	1391 (I01, Mon)
Redondo, Tony.....	1783 (I06, Mon)	Rivera, Melissa.....	1860 (K02, Tue)	Roy Chaudhuri, Ayan.....	2031 (M01, Wed)
Redwing, Joan.....	1252 (B06, Tue)	Rivera-Hernández, Selene.....	750 (B01-09, Tue),750 (B04, Tue), 751 (B04, Tue),751 (B01-09, Tue)	Rozen, John.....	58 (A01, Tue), 1165 (G01, Mon),1173 (G01, Mon)
Reed, Brad.....	109 (A01, Thu)	Roa Morales, Gabriela.....	2207 (Z01, Tue)	Rozhkova, Elena.....	1622 (I03, Tue)
Reed, David.....	134 (A02, Sun), 179 (A02, Mon),379 (A02, Thu), 417 (A03, Tue)	Roa-Morales, G.....	2228 (Z01, Tue)	Rozière, Jacques.....	1975 (L04, Tue), 1986 (L04, Tue)
Reed, Peter.....	1703 (I05, Mon)	Robb, Brian.....	507 (A04, Thu)	Rozman, Kyle.....	1011 (C01, Tue)
Refugio-García, Elizabeth.....	751 (B04, Tue),751 (B01-09, Tue)	Robbiano, Valentina.....	748 (B03, Wed),2112 (M03, Wed)	Rozo, Sebastian.....	1046 (D01, Wed)
Regalbuto, John.....	1526 (I02, Tue)	Robel, Istvan.....	890 (B07, Tue)	Rubenstein, Mitchell.....	1370 (H03, Wed)
Regmi, Yagya.....	1462 (I01, Thu)	Roberts, Scott.....	287 (A02, Tue)	Rucci, Alexis.....	378 (A02, Thu)
Rehman, Saeed.....	1759 (I05, Wed)	Robinson, Joshua.....	756 (B04, Thu)	Rudman, Kelly.....	1102 (F02, Mon)
Reich, Stephanie.....	704 (B03, Mon)	Robinson, Joshua.....	842 (B06, Tue)	Rudra, Indranil.....	1130 (F04, Tue)
Reid, Jonathan.....	1055 (E01, Wed)	Robinson, Pierce.....	519 (A05, Sun)	Rufang, Peng.....	801 (B05, Tue), 801 (B01-09, Tue)
Reid, Obadiah.....	627 (B01, Wed), 820 (B06, Mon)	Robinson, Sophie.....	508 (A04, Thu)	Ruiz, Olivia.....	140 (A02, Sun)
Reid, Russell.....	1902 (L01, Tue), 2204 (Z01, Tue)	Robison, Russ.....	1048 (E01, Wed)	Rumpf, Klemens.....	1114 (F03, Tue), 1115 (F03, Tue)
Reifsnider, Kenneth.....	1693 (I05, Sun)	Rocheffort, Dominic.....	68 (A01, Tue),489 (A04, Wed)	Rumsey, J.....	1265 (H01, Mon)
Rein, Regis.....	914 (B08, Tue), 914 (B01-09, Tue)	Rodene, Dylan.....	1630 (I03, Tue)	Ruotolo, Luis.....	1067 (F01, Wed)
Reissner, Michael.....	1114 (F03, Tue)	Röder, Fridolin.....	367 (A02, Thu)	Ruotolo, Luis Augusto.....	1288 (H01, Tue),2250 (Z02, Mon)
Reith, Lukas.....	1992 (L04, Wed)	Rodopoulos, Theo.....	1078 (F01, Wed)	Rus, Eric.....	527 (A05, Sun)
Rej, Sourav.....	1607 (I03, Mon)	Rodrigo, Eduardo.....	1092 (F01, Thu)	Rusetskii, Igor.....	42 (A01, Mon), 802 (B06, Sun)
Remsen, Edward.....	1033 (D01, Tue)	Rodríguez, Christiane.....	2252 (Z02, Mon)	Rusling, James.....	1884 (K03, Wed),2114 (M03, Thu)
Ren, Dongsheng.....	530 (A05, Mon), 582 (A06, Tue),585 (A06, Tue), 593 (A06, Tue)	Rodríguez, Alvaro.....	1011 (C01, Tue)	Russner, Niklas.....	1119 (F03, Tue)
Ren, Dongsheng.....	581 (A06, Tue)	Rodríguez, Jaime.....	453 (A03, Wed)	Ruther, Rose.....	358 (A02, Thu), 451 (A03, Wed)
Ren, Fan.....	1261 (H01, Mon), 1264 (H01, Mon),1268 (H01, Mon), 1269 (H01, Mon),2082 (M03, Tue)	Rodríguez-Fortea, Antonio.....	786 (B05, Mon),787 (B05, Mon), 788 (B05, Tue),790 (B05, Tue), 792 (B05, Tue)	Rutkowska, Iwona.....	1650 (I03, Thu),1970 (L04, Mon), 1973 (L04, Mon),1979 (L04, Tue)
Ren, Hang.....	1908 (L01, Tue)	Rodríguez-Lopez, Joaquin.....	1893 (L01, Mon),1913 (L01, Tue)	Ryan, Emily.....	92 (A01, Thu), 479 (A04, Wed)
Ren, Hongliang.....	1345 (H02, Wed)	Rodríguez-Mendez, Maria Luz.....	899 (B08, Tue)	Ryan, Mary.....	986 (C01, Mon), 1024 (C01, Wed)
Ren, Hongliang.....	1372 (H03, Wed)	Rodríguez-Toro, Victor.....	1246 (G03, Wed)	Rynne, Olivier.....	68 (A01, Tue), 489 (A04, Wed)
Ren, Xiaodi.....	132 (A02, Sun), 167 (A02, Mon)	Roeflaers, Maarten.....	285 (A02, Tue)	Ryou, Jae-Hyun.....	1285 (H01, Tue)
Ren, Yang.....	306 (A02, Wed)	Rogall, Martin.....	107 (A01, Thu)	Ryou, Myung-Hyun.....	210 (A02, Mon),214 (A02, Mon), 228 (A02, Mon),511 (A05, Sun)
Ren, Yang.....	179 (A02, Mon)	Rogers, John.....	970 (B09, Wed)	Ryu, Hansik.....	2182 (Z01, Tue)
Renman, Viktor.....	296 (A02, Wed)	Rogier, Clemence.....	91 (A01, Wed)	Ryu, Hoon-Hee.....	223 (A02, Mon)
Renman, Viktor.....	329 (A02, Wed)	Rogov, Andrii.....	728 (B01-09, Tue), 728 (B03, Tue)	Ryu, Hye-Min.....	195 (A02, Mon)
Renner, Julie.....	1683 (I04, Tue), 2206 (Z01, Tue)	Rogstad, Daniel.....	318 (A02, Wed)	Ryu, Kwang-Sun.....	39 (A01, Mon)
Renner, Julie.....	1677 (I04, Tue), 1837 (K01, Mon)	Roh, Jangho.....	1178 (G01, Mon)	Ryu, Won-Gyue.....	215 (A02, Mon)
Rennie, Anthony.....	480 (A04, Wed)	Roh, Youngjoon.....	210 (A02, Mon), 511 (A05, Sun)	Ryu, WonHyung.....	1835 (K01, Mon)
Repukaiati, Reyixiati.....	1000 (C01, Tue)	Rohal, Renu.....	910 (B08, Tue), 910 (B01-09, Tue)		
Reshetenko, Tatyana.....	1487 (I02, Sun)	Rohringer, Philip.....	716 (B03, Tue)		
Reuster, James.....	584 (A06, Tue)	Roldan Cuenya, Beatriz.....	1655 (I03, Thu),1804 (I06, Tue), 1977 (L04, Tue)		
Rewatkar, Prakash.....	1543 (I02, Wed)	Rolison, Debra.....	383 (A02, Thu), 2147 (Z01, Tue)		
Reyes Cruz, Edgar.....	931 (B08, Wed),1638 (I03, Tue)	Rolison, Debra.....	1769 (I05, Thu)		
Reyes Pérez, Edgar Miguel.....	2207 (Z01, Tue)	Romanjek, Krunoslav.....	1253 (G03, Wed)		
Reynolds, Daryl.....	2013 (M01, Tue)	Romero, Adrián.....	1243 (G03, Tue)		
Rezeq, Moh'd.....	1200 (G01, Wed)	Romero, Henry.....	1461 (I01, Thu), 1487 (I02, Sun)		
Rizak, Ayman.....	1200 (G01, Wed)	Romero, Joseph.....	1196 (G01, Wed)		
Rheinländer, Philipp.....	1793 (I06, Mon)	Romero-Romo, Mario.....	750 (B01-09, Tue),750 (B04, Tue)		
Rhoades, Robert.....	1042 (D01, Wed)	Rondin, Loïc.....	719 (B03, Tue)		
Rhodes, Christopher.....	203 (A02, Mon),1463 (I01, Thu), 2147 (Z01, Tue),2208 (Z01, Tue)	Rooney, Ryan.....	354 (A02, Thu)		
Ri, Vladislav.....	2170 (Z01, Tue)	Roper, Thomas.....	1899 (L01, Mon)		
Riaz, Muhammad Adil.....	2006 (M01, Tue)	Roque-de la O, Noemi.....	750 (B01-09, Tue),750 (B04, Tue), 751 (B04, Tue),751 (B01-09, Tue)		
Ribeiro, Caue.....	1288 (H01, Tue)	Rose, Aaron.....	818 (B06, Mon)		
Richard, Derek.....	1805 (I06, Tue)	Rose, Michael.....	1203 (G02, Tue), 1643 (I03, Wed)		
Richard, Kayla.....	1746 (I05, Wed)	Ross, Frances.....	1165 (G01, Mon)		
Richards, Danielle.....	1662 (I03, Thu)	Ross, Nick.....	977 (C01, Mon)		
Richter, Lee.....	1123 (F04, Tue)	Rossetti, Nicolò.....	1250 (G03, Wed),1878 (K03, Wed)		
Richter, Mark.....	573 (A06, Mon)	Rossmeisl, Jan.....	1527 (I02, Tue)		
Ridgeway, Robert.....	1032 (D01, Tue)	Rost, Christina.....	1281 (H01, Tue)		
Riedo, Andreas.....	1060 (E01, Wed)	Rotkin, Slava.....	822 (B06, Mon)		
Riesen, Jon.....	1043 (D01, Wed)	Roué, Lionel.....	546 (A05, Mon), 557 (A05, Mon)		
Riheen, Manjurul.....	2020 (M01, Tue)	Rouleau, Chris.....	1929 (L01, Wed)		
Riheen, Manjurul Ahsan.....	2014 (M01, Tue)				
Rikka, Vallabha.....	492 (A04, Wed)				
Riley, D.....	986 (C01, Mon)				
Riley, Kevin.....	1886 (L01, Mon)				

S

Saab, Emir.....	1559 (I02, Wed)
Saadat, Irfan.....	1200 (G01, Wed)
Sabarirajan, Dinesh.....	1831 (I06, Wed)
Sabolsky, Edward.....	83 (A01, Wed),2013 (M01, Tue)
Sabolsky, Katarzyna.....	2013 (M01, Tue)
Sabor, Jalal.....	1089 (F01, Wed)
Sacci, Robert.....	513 (A05, Sun),526 (A05, Sun), 553 (A05, Tue)
Sadan, Milan.....	462 (A04, Wed)
Sadana, Devendra.....	58 (A01, Tue)
Sadeghnejad, Abdolhamid.....	1711 (I05, Mon)
Sadhu, Subha.....	869 (B07, Mon)
Saeed, Mahfouz.....	855 (B07, Sun)
Safae, Mohammad Moein.....	685 (B02, Thu)
Safae, Mohammad Moein.....	694 (B03, Mon)
Safari, Mojtaba.....	476 (A04, Wed)
Safari, Tahereh.....	476 (A04, Wed)
Saffary, Yalda.....	2118 (M03, Thu),2234 (Z01, Tue), 2238 (Z01, Tue)
Safwan, Aroua.....	777 (B05, Mon)
Sagara, Akihiko.....	148 (A02, Mon), 285 (A02, Tue)
Sagawa, Ryohei.....	625 (B01, Wed)
Sagawa, Takashi.....	865 (B07, Mon)
Saha, Prantik.....	1889 (L01, Mon)

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Saha, Tonmoy Kumar	2014 (M01, Tue), 2020 (M01, Tue)	Sapkota, Keshab	1273 (H01, Tue)	Schmiege, Johannes	1119 (F03, Tue)
Sahihi, Mehdi	1843 (K01, Mon)	Saqib, Najmus	520 (A05, Sun), 580 (A06, Tue)	Schmitt, Rebecca	1195 (G01, Wed), 1196 (G01, Wed)
Sahu, Akhila	1747 (I05, Wed)	Sarang, Kasturi	301 (A02, Wed)	Schmitz, Sven	1742 (I05, Wed)
Sahu, Kisor	247 (A02, Tue)	Sarangadharan, Indu	1301 (H02, Mon), 1309 (H02, Mon)	Schmuki, Patrik	1204 (G02, Tue), 2061 (M02, Wed)
Sahu, Sumit	492 (A04, Wed)	Saraswat, Vivek	846 (B06, Tue), 847 (B06, Tue)	Schnabel, Manuel	252 (A02, Tue), 305 (A02, Wed)
Saida, Takahiro	1493 (I02, Sun)	Sarfo, Kofi	995 (C01, Tue), 1001 (C01, Tue)	Schneider, Daniel	1150 (F04, Wed), 1752 (I05, Wed)
Saikumar, Ashwin Kumar	2185 (Z01, Tue), 2186 (Z01, Tue)	Sargent, Edward	1580 (I03, Sun), 1585 (I03, Sun)	Schneider, Severin	1240 (G03, Tue)
Saito, Kentaro	2181 (Z01, Tue)	Sarigamala, Karthik	642 (B01, Thu)	Schneider, Dan	300 (A02, Wed), 486 (A04, Wed)
Saito, Makoto	2229 (Z01, Tue)	Sarkar, Debasish	75 (A01, Wed)	Schnell, Sondre	125 (A02, Sun)
Saito, Satomi	1840 (K01, Mon)	Sarkar, Susmita	49 (A01, Tue), 310 (A02, Wed), 657 (B01, Thu)	Schuergers, Nils	660 (B02, Tue), 661 (B01-09, Tue), 661 (B01-09, Tue), 661 (B02, Tue), 662 (B02, Tue), 662 (B01-09, Tue), 684 (B02, Thu), 690 (B02, Thu), 728 (B01-09, Tue), 728 (B03, Tue), 729 (B03, Tue), 729 (B01-09, Tue)
Saito, Tomonori	291 (A02, Tue), 450 (A03, Wed), 451 (A03, Wed), 452 (A03, Wed)	Sarker, Hori Pada	1596 (I03, Sun)	Schulte, Leanna	1982 (L04, Tue)
Saji, Viswanathan S.	1010 (C01, Tue)	Sarker, Hori Pada	1962 (L03, Tue)	Schulte, Nicole	1793 (I06, Mon)
Sakai, Hayato	891 (B07, Tue)	Sarker, Mritunjoy	2191 (Z01, Tue), 2193 (Z01, Tue)	Schulz, Volker	1116 (F03, Tue)
Sakai, Hiroki	529 (A05, Mon)	Sarma, Saurav	1391 (I01, Mon)	Schulz, Volker Paul	1742 (I05, Wed)
Sakai, Kentaro	189 (A02, Mon)	Sarou-Kanian, Vincent	537 (A05, Mon)	Schulze-Küppers, Falk	1728 (I05, Tue)
Sakaida, Shizuka	1064 (E01, Wed)	Sarpkaya, Ibrahim	745 (B03, Wed)	Schwander, Lukas	1635 (I03, Tue)
Sakamoto, Jeff	161 (A02, Mon), 572 (A06, Mon)	Sarvari, Hojjatollah	857 (B07, Sun)	Schwartz, D.	372 (A02, Thu), 1154 (F04, Thu), 1155 (F04, Thu)
Sakata, Toshiya	1302 (H02, Mon)	Sasakawa, Tetsuya	172 (A02, Mon)	Schwartz, Daniel	1156 (F04, Thu), 1162 (F04, Thu)
Sakata, Yoshihisa	1923 (L01, Wed)	Sasaki, Kotaro	1929 (L01, Wed)	Schweizer, Frank	1843 (K01, Mon)
Sakizadeh, John	1711 (I05, Mon)	Sasaki, Kyomin	1294 (H01, Wed)	Scipioni, Roberto	555 (A05, Tue)
Salamat, Yasamin	1110 (F03, Tue), 1967 (L03, Tue)	Sassin, Megan	383 (A02, Thu), 1518 (I02, Tue), 1769 (I05, Thu)	Scisco, Gibson	1775 (I05, Thu)
Salarvand, Zohreh	998 (C01, Tue)	Satjaritanun, Pongsarun	1103 (F03, Tue)	Scopelliti, Matteo	666 (B02, Wed)
Saleh, Mohammad	104 (A01, Thu)	Sato, Daiki	1470 (I01, Thu)	Scott, Ethan	1187 (G01, Tue)
Salinas, Maria	2156 (Z01, Tue), 2162 (Z01, Tue)	Sato, Takaya	1097 (F01, Thu)	Scott, Soren	1404 (I01, Mon)
Sallis, Shawn	307 (A02, Wed)	Sato, Teruya	1845 (K01, Mon), 1853 (K01, Mon), 1854 (K01, Mon)	Scott, Soren	1527 (I02, Tue)
Salmani Rezaie, Salva	2012 (M01, Tue)	Sato, Yusaku	1854 (K01, Mon)	See, Kimberly	354 (A02, Thu)
Salunke, Ashish	2166 (Z01, Tue)	Sato, Yuto	2267 (Z03, Mon)	Seeler, Tiffany	783 (B05, Mon), 784 (B05, Mon), 798 (B05, Tue), 798 (B01-09, Tue)
Salunke, Ashish Shivaji	1015 (C01, Tue)	Satyapal, Sunita	1791 (I06, Mon)	Seetharaman, Sairaman	904 (B08, Tue)
Salvo-Comino, Coral	899 (B08, Tue)	Saucedo, Cynthia	2161 (Z01, Tue)	Seger, Brian	1069 (F01, Wed), 1527 (I02, Tue), 1589 (I03, Sun)
Sambath Kumar, Kowsik	1985 (L04, Tue)	Sauer, Dirk Uwe	517 (A05, Sun), 549 (A05, Mon)	Seguin, Trevor	350 (A02, Thu), 351 (A02, Thu)
Sambath Kumar, Kowsik	645 (B01, Thu)	Sauvage, Madline	686 (B02, Thu)	Seidler, Gerald	534 (A05, Mon)
Sambur, Justin	1993 (L04, Wed), 2270 (Z03, Mon)	Savalia, Rutesh	2109 (M03, Wed)	Seiftokaldani, Ali	1588 (I03, Sun)
Samu, Gergely	1658 (I03, Thu)	Savinell, R.	1786 (I06, Mon)	Seitz, William	2108 (M03, Wed)
Sanchez, Erik	1856 (K01, Mon)	Savinell, Robert	1077 (F01, Wed)	Sekar, Chinnathambi	2090 (M03, Wed)
Sanchez, Joel	1380 (I01, Sun)	Sawamoto, Naomi	838 (B06, Tue)	Sekhar, Praveen	2020 (M01, Tue)
Sanchez, Jose	1234 (G03, Tue)	Sawangphruk, Montree	162 (A02, Mon), 170 (A02, Mon), 250 (A02, Tue), 274 (A02, Tue), 275 (A02, Tue), 364 (A02, Thu), 385 (A02, Thu), 493 (A04, Thu), 494 (A04, Thu), 532 (A05, Mon), 615 (B01-09, Tue), 615 (B01, Tue)	Sekhar, Praveen K.	2014 (M01, Tue)
Sánchez-Diez, Eduardo	153 (A02, Mon)	Saxena, Apurv	1411 (I01, Tue)	Seki, Juntaro	2145 (Z01, Tue)
Sánchez-García, David	954 (B08, Thu)	Saxena, Apurv	1642 (I03, Wed)	Seki, Ryohei	2199 (Z01, Tue)
Sánchez-Padilla, N. M.	1566 (I02, Wed)	Saxena, Sumit	642 (B01, Thu)	Seland, Frode	1396 (I01, Mon)
Sandbeck, Daniel	1554 (I02, Wed)	Saxon, Aron	1133 (F04, Tue)	Selbach, Sverre Magnus	816 (B06, Mon)
Sanders, Stephen	1026 (C01, Wed)	Sayers, Ruth	480 (A04, Wed)	Self, Ethan	256 (A02, Tue), 314 (A02, Wed), 450 (A03, Wed), 451 (A03, Wed), 452 (A03, Wed)
Sandineni, Prashanth	467 (A04, Wed)	Sazanovich, Igor	524 (A05, Sun)	Self, Julian	350 (A02, Thu)
Sanford, James	1043 (D01, Wed)	Scalèse, Silvia	1435 (I01, Wed)	Selis, Luis	156 (A02, Mon)
Sanghadasa, Mohan	111 (A02, Sun)	Scanlan, Kevin	249 (A02, Tue)	Selskis, Algirdas	1556 (I02, Wed)
Sankar, Muniappan	901 (B08, Tue)	Scanley, Ellen	36 (A01, Mon)	Selvamani, Vadivel	364 (A02, Thu)
Sankar, Muniappan	904 (B08, Tue), 906 (B08, Tue), 906 (B01-09, Tue), 908 (B08, Tue), 908 (B01-09, Tue), 909 (B08, Tue), 909 (B01-09, Tue), 910 (B08, Tue), 910 (B01-09, Tue), 951 (B08, Thu)	Schabel, Wilhelm	181 (A02, Mon)	Seminario, Jorge	156 (A02, Mon)
Sankaran, R. Mohan	1683 (I04, Tue)	Schaefer, Jennifer	498 (A04, Thu), 542 (A05, Mon)	Semivrazhskaya, Olesya	777 (B05, Mon)
Sankarasubramanian, Shrihari	431 (A03, Tue)	Schappacher, Falko	165 (A02, Mon), 567 (A06, Mon)	Semsari Parapari, Sorour	53 (A01, Tue)
Sankhala, Devang	2051 (M01, Wed)	Schardt, Sven	792 (B05, Tue)	Senkovskiy, Boris	845 (B06, Tue), 852 (B01-09, Tue), 852 (B06, Tue)
Sankhala, Devangsingh	2101 (M03, Wed)	Schechter, Alex	1528 (I02, Tue), 1679 (I04, Tue), 2260 (Z03, Mon)	Seo, Hongmin	1444 (I01, Wed)
Sano, Katsuhiko	671 (B02, Wed)	Scheidt, Rebecca	1658 (I03, Thu)	Seo, Jeongsuk	1603 (I03, Sun)
Santamaria, Anthony	1538 (I02, Wed)	Scherson, Daniel	1888 (L01, Mon), 2265 (Z03, Mon)	Seo, Yerin	193 (A02, Mon)
SantAnna, Mércia	2043 (M01, Wed), 2068 (M02, Wed)	Schichtl, Zebulon	989 (C01, Mon)	Seong, Tae-Yeon	1280 (H01, Tue)
Santhanagopalan, Shriram	1120 (F03, Tue), 1129 (F04, Tue), 1133 (F04, Tue), 1136 (F04, Wed), 1157 (F04, Thu)	Schild, Dieter	1020 (C01, Wed)	Sepulveda, Jonathan	456 (A03, Wed)
Santinelli, Andrea	728 (B01-09, Tue), 728 (B03, Tue)	Schlatmann, Rutger	1636 (I03, Tue)	Sepunaru, Lior	1867 (K02, Tue)
Santoni, Marie-Pierre	1979 (L04, Tue)	Schlom, Darrell	1707 (I05, Mon)	Sepunaru, Lior	1385 (I01, Sun), 2263 (Z03, Mon)
Santori, Pietro	1488 (I02, Sun)	Schlueter, James	1032 (D01, Tue)	Serbutovtzev, Christophe	1253 (G03, Wed)
Santos, Ewerton	2043 (M01, Wed)	Schmauss, Travis	1726 (I05, Tue)	Sergeyev, Vladimir	415 (A03, Mon)
Sanyal, Udishnu	1091 (F01, Thu), 1612 (I03, Mon), 1625 (I03, Tue)	Schmidt, Oke	367 (A02, Thu)	Serizawa, Nobuyuki	265 (A02, Tue)
Sanz Camacho, Paula	468 (A04, Wed), 544 (A05, Mon)	Schmidt, Thomas	1405 (I01, Mon), 1809 (I06, Tue)		

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Serov, Alexey	1461 (I01, Thu), 1487 (I02, Sun)	Shibiri, Beauty	29 (A01, Mon)	Siegal, Michael	2008 (M01, Tue)
Setaro, Antonio	702 (B03, Mon)	Shiga, Tamehito	732 (B03, Tue), 732 (B01-09, Tue)	Siegel, Jason	586 (A06, Tue)
Setzler, Brian	1824 (I06, Wed)	Shigematsu, Toshio	400 (A03, Mon), 401 (A03, Mon)	Sierros, Kostas	2013 (M01, Tue)
Shabanov, Aslan	1850 (K01, Mon), 1851 (K01, Mon)	Shih, Jiun-Le	1568 (I02, Wed)	Sigalas, Iakovos	51 (A01, Tue)
Shadlaghani, Arash	1902 (L01, Tue)	Shihabudeen, P. K.	2031 (M01, Wed)	Sigman, Matthew	508 (A04, Thu)
Shah, Janki	721 (B03, Tue)	Shiku, Hitoshi	1845 (K01, Mon), 2259 (Z03, Mon), 2267 (Z03, Mon)	Silva, Jonatas	2045 (M01, Wed)
Shahbazian-Yassar, Reza	603 (A06, Wed), 606 (A06, Wed)	Shim, Hyung Cheoul	65 (A01, Tue)	Silva, Liyanage	2209 (Z01, Tue)
Shaheen, Nora	1072 (F01, Wed)	Shim, Jae-Hyoung	1284 (H01, Tue)	Silva, Liyanage	1573 (I02, Thu)
Shahzad, Hafiz	550 (A05, Mon)	Shim, Joon Hyung	1645 (I03, Wed)	Silvioli, Luca	1527 (I02, Tue)
Shaijumon, Manikoth	298 (A02, Wed), 1409 (I01, Tue)	Shim, Joon Hyung	1755 (I05, Wed), 1756 (I05, Wed), 1760 (I05, Wed), 1762 (I05, Wed)	Sim, Daniel	1370 (H03, Wed)
Shaijumon, Manikoth	32 (A01, Mon)	Shim, Tae-Hun	1284 (H01, Tue)	Sim, Kee-Baek	1280 (H01, Tue)
Shakirova, Nadezhda	238 (A02, Mon)	Shima, Keisuke	1197 (G01, Wed)	Sim, Tae-hun	882 (B07, Tue)
Shakouri, Ali	1270 (H01, Mon)	Shimada, Mikinari	285 (A02, Tue)	Simic, Nina	1094 (F01, Thu)
Shalyt, Eugene	1054 (E01, Wed)	Shimakoshi, Hisashi	1864 (K02, Tue)	Simko, Steven	521 (A05, Sun)
Shamso, Ahmed	1024 (C01, Wed)	Shimizu, Akira	1228 (G02, Wed)	Šimkūnaitė, Dijana	1556 (I02, Wed), 1558 (I02, Wed)
Shan, Xiaonan	556 (A05, Tue)	Shimizu, Tomohiro	1217 (G02, Tue)	Simon, Nathalie	1206 (G02, Tue), 1213 (G02, Tue), 1220 (G02, Wed), 1224 (G02, Wed)
Shan, Xiaonan	1891 (L01, Mon)	Shimpalee, Sirivatch	1103 (F03, Tue)	Simone, Angelo	1944 (L03, Mon), 1945 (L03, Mon)
Shanahan, Jordan	2196 (Z01, Tue)	Shin, Chee Burm	37 (A01, Mon), 38 (A01, Mon)	Simonova, Anastasiya	1850 (K01, Mon)
Shanbhag, Sneha	2171 (Z01, Tue), 2240 (Z02, Mon), 2246 (Z02, Mon)	Shin, Dongjoo	1381 (I01, Sun)	Simpkins, Blake	1991 (L04, Wed)
Shang, Mingwei	164 (A02, Mon)	Shin, Dongwook	1483 (I02, Sun)	Simpson, Alexander	1047 (D01, Wed)
Shang, Zeyu	308 (A02, Wed)	Shin, Eui Jong	1755 (I05, Wed), 1756 (I05, Wed)	Simpson, Burton	1893 (L01, Mon), 1913 (L01, Tue)
Shao, Han	2117 (M03, Thu)	Shin, Hoseong	1282 (H01, Tue)	Sinanan, Anson	409 (A03, Mon)
Shao, Minhua	1516 (I02, Tue), 1689 (I04, Tue), 1691 (I04, Tue)	Shin, Hyun-Seop	215 (A02, Mon), 219 (A02, Mon)	Sinclair, Robert	929 (B08, Wed)
Shao, Minhua	1401 (I01, Mon), 1656 (I03, Thu)	Shin, Jaewook	1433 (I01, Wed)	Singh, Arvinder	114 (A02, Sun), 503 (A04, Thu)
Shao, Minhua	1626 (I03, Tue), 1680 (I04, Tue)	Shin, Joon	317 (A02, Wed)	Singh, Meenesh	1675 (I04, Tue)
Shao, Shuai	912 (B08, Tue), 912 (B01-09, Tue)	Shin, Kwon Yong	1176 (G01, Mon)	Singh, Nirala	438 (A03, Wed), 1662 (I03, Thu)
Shao, Shuai	782 (B05, Mon)	Shin, Minjeong	175 (A02, Mon), 354 (A02, Thu)	Singh, Santosh	634 (B01, Wed)
Shao, Yunqi	1943 (L03, Mon)	Shin, Seobom	225 (A02, Mon)	Singh, Shivkant	1285 (H01, Tue)
Shao, Yuyan	379 (A02, Thu), 417 (A03, Tue)	Shin, Ye Ji	1193 (G01, Wed)	Singhal, Rahul	36 (A01, Mon)
Shapira, Barak	629 (B01, Wed)	Shinde, Mahesh	881 (B07, Tue), 960 (B09, Wed), 2212 (Z01, Tue)	Sinitskii, Alexander	844 (B06, Tue)
Sharafeldin, Mohamed	2114 (M03, Thu)	Shinde, Sambhaji	6 (A01, Sun), 35 (A01, Mon), 2198 (Z01, Tue)	Sinrud, Joshua	1723 (I05, Tue)
Sharafi, Asma	521 (A05, Sun)	Shingubara, Shoso	1217 (G02, Tue)	Sinton, David	1580 (I03, Sun), 1585 (I03, Sun)
Sharan, Abhishek	1627 (I03, Sun)	Shinoda, Wataru	1942 (L03, Mon)	Siri Kiran Janardhana, Reddy Kunda	2036 (M01, Wed)
Sharifi Golru, Samaneh	1582 (I03, Sun)	Shinohara, Akihiro	1806 (I06, Tue)	Sisk, Peter	1215 (G02, Tue)
Sharma, Ganesh	922 (B08, Wed)	Shinohara, Kazuhiko	1551 (I02, Wed), 1572 (I02, Thu)	Sisto, Thomas	627 (B01, Wed)
Sharma, Gyan	90 (A01, Wed), 2148 (Z01, Tue)	Shiota, Yoshihito	902 (B08, Tue)	Sivakumar, Sri	90 (A01, Wed), 2148 (Z01, Tue)
Sharma, Lalit	117 (A02, Sun), 381 (A02, Thu)	Shirakawa, Takashi	1634 (I03, Tue)	Sivaneri Varadharajan Idhaiaam, Kavin	2013 (M01, Tue)
Sharma, Shikha	448 (A03, Wed)	Shiraki, Tomohiro	697 (B03, Mon), 732 (B03, Tue), 732 (B01-09, Tue)	Skachkov, Dmitry	1955 (L03, Tue)
Sharma, Shikha	449 (A03, Wed)	Shitanda, Isao	984 (C01, Mon)	Skaria, Giji	2186 (Z01, Tue)
Sharma, Vidushi	144 (A02, Sun)	Shiwardski, Daniel	666 (B02, Wed)	Skibinska, Katarzyna	1387 (I01, Sun), 1413 (I01, Tue), 2174 (Z01, Tue)
Sharma, Yogesh	463 (A04, Wed)	Shkrob, Ilya	262 (A02, Tue), 445 (A03, Wed)	Skinn, Brian	966 (B09, Wed), 1099 (F02, Mon), 1100 (F02, Mon)
Sharp, Ian D.	1637 (I03, Tue)	Shobha, Hosadurga	1055 (E01, Wed)	Skinner, Anna	1775 (I05, Thu)
Shaw, Leon	246 (A02, Tue), 336 (A02, Wed), 361 (A02, Thu)	Shodiev, Abbos	378 (A02, Thu)	Skyllas-Kazacos, Maria	404 (A03, Mon)
Shawky, Ahmed	624 (B01, Wed), 794 (B05, Tue)	Shoji, Yasushi	1230 (G02, Wed)	Slack, John	1821 (I06, Wed)
Shearing, Paul	64 (A01, Tue), 512 (A05, Sun), 518 (A05, Sun), 543 (A05, Mon), 570 (A06, Mon), 1473 (I02, Sun), 1474 (I02, Sun), 1535 (I02, Wed)	Sholin, Mark	40 (A01, Mon)	Slocik, Joseph	1370 (H03, Wed)
Shebert, George	113 (A02, Sun)	Shrestha, Sujan	2141 (Z01, Tue)	Small, Leo	454 (A03, Wed)
Shekhtman, Inna	486 (A04, Wed)	Shrestha, Sujan	40 (A01, Mon)	Smaran, Kumar Sai	325 (A02, Wed)
Shellikeri, Annadanesh	97 (A01, Thu)	Shuck, Christopher E.	817 (B06, Mon)	Smart, Christopher	710 (B03, Mon)
Shelton, Austin	438 (A03, Wed)	Shukla, Anupam	618 (B01-09, Tue), 618 (B01, Tue)	Smart, Guillermo	180 (A02, Mon)
Shelton, William	1768 (I05, Thu)	Shukla, Ashok	75 (A01, Wed), 419 (A03, Tue), 449 (A03, Wed)	Smart, Marshall	177 (A02, Mon)
Shen, Cai	55 (A01, Tue)	Shukla, Shobha	642 (B01, Thu)	Smart, Tyler	1467 (I01, Thu)
Shen, Dai	1072 (F01, Wed)	Shuyue, Jiang	1012 (C01, Tue)	Šmid, Břetislav	1447 (I01, Wed)
Shen, Hao	71 (A01, Wed)	Si, Bo	2108 (M03, Wed)	Smith, Diane	1860 (K02, Tue), 1861 (K02, Tue), 1877 (K03, Wed), 1879 (K03, Wed), 2214 (Z01, Tue), 2217 (Z01, Tue), 2218 (Z01, Tue), 2219 (Z01, Tue)
Shen, Jimmy	860 (B07, Sun)	Si, Mengwei	1180 (G01, Tue), 1270 (H01, Mon)	Smith, Kandler	324 (A02, Wed), 368 (A02, Thu), 1136 (F04, Wed)
Shen, Jimmy-Xuan	360 (A02, Thu)	Si, Shihui	2126 (Z01, Tue)	Smith, Kirk	455 (A03, Wed)
Shen, Kyle	1707 (I05, Mon)	Siahrostami, Samira	1553 (I02, Wed)	Smith, Kyle	1108 (F03, Tue)
Shen, Yang	2057 (I02, Wed)	Siaj, Mohamed	834 (B06, Tue)	Smith, Nicolette	1860 (K02, Tue)
Sheng, Yangping	599 (A06, Wed)	Siaugue, Jean-Michel	2125 (M03, Thu)	Smith, Sean	1187 (G01, Tue)
Shervin, Shahab	1285 (H01, Tue)	Siddharth, Kumar	1689 (I04, Tue)	Smotkin, Eugene	1921 (L01, Wed), 1963 (L03, Tue)
Shi, Guoyu	1798 (I06, Tue), 1956 (L03, Tue)	Siddiqui, Shabnam	2001 (M01, Mon)	Smulders, Vera	1094 (F01, Thu)
Shi, Lei	716 (B03, Tue)	Siddiqui, Shabnam	2078 (M03, Tue), 2106 (M03, Wed), 2107 (M03, Wed)		
Shi, Lili	132 (A02, Sun)	Sides, William	1062 (E01, Wed)		
Shi, Lin	1824 (I06, Wed)	Siefman, Daniel	720 (B03, Tue)		
Shi, San-Qiang	992 (C01, Mon)				
Shi, Yan	1430 (I01, Wed), 1452 (I01, Wed)				
Shiba, Yoshinobu	1228 (G02, Wed)				

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Smythe, Nathan	448 (A03, Wed)	Srimanon, Krisara	250 (A02, Tue)	Stuckman, Mengling	1996 (L04, Wed)
Snyder, Stephen	966 (B09, Wed), 1099 (F02, Mon)	Srinivasan, Rengaswamy	584 (A06, Tue)	Stuve, Eric	1687 (I04, Tue)
Sode, Koji	1840 (K01, Mon), 1906 (L01, Tue), 1935 (L02, Tue), 2227 (Z01, Tue)	Srinivasan, Venkat	100 (A01, Thu)	Su, Bizhe	470 (A04, Wed)
Sofie, Stephen	71 (A01, Wed), 1723 (I05, Tue)	Stadermann, Michael	436 (A03, Tue), 1066 (F01, Wed)	Su, Jia Quan	1194 (G01, Wed)
Soheilian, Rasam	1110 (F03, Tue)	Stahl, Shannon	1866 (K02, Tue)	Su, Lin-Ya	1934 (L02, Tue)
Sohn, Myungbeom	255 (A02, Tue)	Stalnlionis, Giedrius	612 (B01, Tue), 612 (B01-09, Tue)	Su, Lu	2144 (Z01, Tue)
Sokolov, Alexei	522 (A05, Sun)	Stamenkovic, Vojislav	1398 (I01, Mon), 1414 (I01, Tue), 1491 (I02, Sun), 1797 (I06, Tue), 1971 (L04, Mon)	Su, Tianshun	1746 (I05, Wed)
Solà, Miquel	775 (B05, Mon)	Stan, Marian	165 (A02, Mon)	Su, Wei-Nien	128 (A02, Sun), 1090 (F01, Thu), 1400 (I01, Mon), 1408 (I01, Tue)
Sola-Hernandez, Lluís	1972 (L04, Mon)	Stanciu, Lia	1930 (L02, Tue)	Su, Zeliang	378 (A02, Thu)
Solak, Nuri	79 (A01, Wed)	Stanczyk, Thomas	1110 (F03, Tue)	Subbaraman, Harish	817 (B06, Mon), 2086 (M03, Wed)
Solarska, Renata	1981 (L04, Tue)	Stanley, June	577 (A06, Tue)	Subbaraman, Ram	1141 (F04, Wed)
Soleymani, Leyla	2084 (M03, Wed)	Stapleton, Joseph	687 (B02, Thu)	Subramaniam, Akshay	1128 (F04, Tue), 1153 (F04, Thu), 1157 (F04, Thu), 1159 (F04, Thu)
Solladie, Nathalie	914 (B08, Tue), 914 (B01-09, Tue), 936 (B08, Wed)	Star, Alexander	664 (B02, Wed)	Subramanian, Palaniappan	2260 (Z03, Mon)
Soloveichik, Grigori	1669 (I04, Tue), 1807 (I06, Tue)	Star, Andrew	1506 (I02, Mon), 1513 (I02, Tue)	Subramanian, Venkat	106 (A01, Thu), 372 (A02, Thu), 1128 (F04, Tue), 1129 (F04, Tue), 1153 (F04, Thu), 1154 (F04, Thu), 1156 (F04, Thu), 1157 (F04, Thu), 1159 (F04, Thu)
Soma, Naohiko	2139 (Z01, Tue), 2140 (Z01, Tue)	Starke, Thomas	1742 (I05, Wed)	Subramanian, Vivek	2258 (Z03, Mon)
Someya, Takao	1362 (H03, Tue), 2092 (M03, Wed)	Staser, John	1095 (F01, Thu), 1455 (I01, Wed)	Suchet, Daniel	1230 (G02, Wed)
Son, Hyebeen	191 (A02, Mon)	Stasyuk, Antony	775 (B05, Mon)	Sudoh, Hiroshi	838 (B06, Tue)
Son, Min Ji	1753 (I05, Wed)	Stasyuk, Olga	775 (B05, Mon)	Suduwella, T	266 (A02, Tue), 508 (A04, Thu)
Son, Tae Yang	1732 (I05, Wed), 1750 (I05, Wed)	Stavitski, Eli	536 (A05, Mon), 1522 (I02, Tue), 1672 (I04, Tue), 1996 (L04, Wed)	Sugawa, Shigetoshi	1228 (G02, Wed)
Son, Yongkeun	619 (B01, Tue), 619 (B01-09, Tue), 851 (B01-09, Tue), 851 (B06, Tue)	Staykov, Aleksandar	703 (B03, Mon)	Sugawara, Seiho	1551 (I02, Wed), 1572 (I02, Thu)
Sonavane, Rohit	98 (A01, Thu)	Steele, Julian	285 (A02, Tue)	Sugawati, Vinsensia	154 (A02, Mon), 303 (A02, Wed), 337 (A02, Wed)
Song, Edward	2089 (M03, Wed), 2108 (M03, Wed)	Steele, Leigh Anna	599 (A06, Wed)	Sugimoto, Wataru	1524 (I02, Tue), 1560 (I02, Wed)
Song, Enming	1368 (H03, Wed)	Stefan-van Staden, Raluca-Ioana	942 (B08, Thu), 2122 (M03, Thu)	Sugizaki, Tomoko	172 (A02, Mon)
Song, Haosheng	411 (A03, Mon)	Stefanelli, Manuela	898 (B08, Tue)	Sui, Manling	179 (A02, Mon)
Song, Jihun	194 (A02, Mon)	Stefanopoulou, Anna	586 (A06, Tue)	Sui, Xiaoyu	1300 (H02, Mon)
Song, Jinhua	1294 (H01, Wed)	Steinberg, Katherine	1072 (F01, Wed)	Suk, Jungdon	187 (A02, Mon)
Song, Jun	809 (B06, Sun), 1960 (L03, Tue)	Steiner, Myles	1632 (I03, Tue)	Sukamto, John	1052 (E01, Wed)
Song, Jun Tae	1657 (I03, Thu)	Steingart, Daniel	531 (A05, Mon)	Sulas, Dana	724 (B03, Tue), 820 (B06, Mon), 872 (B07, Mon)
Song, Junhua	179 (A02, Mon)	Steinrueck, Hans-Georg	525 (A05, Sun)	Sullivan, Eirin	2196 (Z01, Tue)
Song, Kwang Ho	1478 (I02, Sun)	Steirer, Kenneth	1120 (F03, Tue)	Suman, Rathod	419 (A03, Tue), 449 (A03, Wed)
Song, Liang	1688 (I04, Tue)	Stephens, Ryan	1130 (F04, Tue)	Sumi, Kyogo	1423 (I01, Tue)
Song, Liang	1522 (I02, Tue)	Stetson, Caleb	305 (A02, Wed), 1536 (I02, Wed)	Sun, Che-Nan	1141 (F04, Wed)
Song, Rak-Hyun	1144 (F04, Wed), 1759 (I05, Wed), 1765 (I05, Wed)	Stettler, Allsion	939 (B08, Thu)	Sun, Chuanyu	1739 (I05, Wed)
Song, Seung-Wan	187 (A02, Mon), 333 (A02, Wed)	Stevens, Michaela	929 (B08, Wed), 1749 (I05, Wed)	Sun, Cui	271 (A02, Tue)
Song, Xueyan	1718 (I05, Tue), 1727 (I05, Tue)	Stevens, Michaela	1495 (I02, Sun)	Sun, Fu	539 (A05, Mon)
Song, Yang	2087 (M03, Wed)	Stevenson, Steven	784 (B05, Mon), 798 (B01-09, Tue), 798 (B05, Tue), 799 (B01-09, Tue), 799 (B05, Tue), 800 (B05, Tue), 800 (B01-09, Tue)	Sun, HoHyun	312 (A02, Wed)
Song, Young-Woog	195 (A02, Mon), 196 (A02, Mon)	Stewart, Courtney	911 (B08, Tue), 911 (B01-09, Tue), 2216 (Z01, Tue)	Sun, Jie	442 (A03, Wed), 505 (A04, Thu)
Song, Yu-Fei	1386 (I01, Sun)	Stewart, Michael	1033 (D01, Tue)	Sun, Ke	536 (A05, Mon)
Sonka, Theresa	688 (B02, Thu)	Stickney, John	1215 (G02, Tue), 1221 (G02, Wed)	Sun, Qiang	1586 (I03, Sun), 1592 (I03, Sun)
Soon, Aloysius	1358 (H03, Tue)	Stieger, Christian	1182 (G01, Tue)	Sun, Rui	157 (A02, Mon)
Sopha, Hanna	2060 (M02, Wed)	Stim, Jarvis	979 (C01, Mon), 980 (C01, Mon)	Sun, Ruojiao	249 (A02, Tue)
Sorée, Bart	1192 (G01, Wed)	Stitt, Camilla	986 (C01, Mon)	Sun, Shaopeng	1049 (E01, Wed)
Sørensen, Jakob	1404 (I01, Mon)	Stoerzinger, Kelsey	1612 (I03, Mon)	Sun, Xiao-Guang	20 (A01, Mon), 248 (A02, Tue), 264 (A02, Tue), 1568 (I02, Wed)
Soto, Fernando	276 (A02, Tue)	Stojanovic, Milan	2121 (M03, Thu)	Sun, Xue-Long	676 (B02, Thu)
Sougrati, Moulay	1492 (I02, Sun)	Stomberg, Jaimie	1047 (D01, Wed)	Sun, Yang	1084 (F01, Wed), 1086 (F01, Wed)
Sougrati, Moulay Tahar	244 (A02, Mon)	Störmer, Heike	1119 (F03, Tue)	Sun, Yang-Kook	221 (A02, Mon), 222 (A02, Mon), 223 (A02, Mon), 224 (A02, Mon), 225 (A02, Mon)
Soule, Cody	1216 (G02, Tue)	Stradins, Pauls	252 (A02, Tue)	Sun, Yang-Kook	243 (A02, Mon)
Soundappan, Thiagarajan	2236 (Z01, Tue)	Strain, Jacob	1623 (I03, Tue)	Sun, Yifan	12 (A01, Sun)
Souto, Ricardo	998 (C01, Tue), 2268 (Z03, Mon)	Strambini, Lucanos	748 (B03, Wed), 2112 (M03, Wed)	Sun, Yu	2064 (M02, Wed)
Souza Filho, Antonio G.	760 (B04, Thu)	Strand, Dee	160 (A02, Mon)	Sundaram, Kalpathy	1218 (G02, Tue), 2165 (Z01, Tue), 2185 (Z01, Tue)
Spangenberg, Jeffrey	25 (A01, Mon)	Strand, Michael	21 (A01, Mon)	Sunde, Svein	1396 (I01, Mon)
Spangler, Leah	1711 (I05, Mon)	Strano, Michael	678 (B02, Thu)	Sunderlin, Nathaniel	1133 (F04, Tue)
Spangler, Scott	599 (A06, Wed)	Strasser, Derek	1576 (I02, Thu), 1833 (I06, Wed)	Sundriyal, Poonam	81 (A01, Wed)
Speck, Florian	1488 (I02, Sun)	Strasser, Peter	1492 (I02, Sun), 1654 (I03, Thu), 1796 (I06, Tue)	Sundriyal, Sandeep	463 (A04, Wed)
Spencer, Ben F.	831 (B06, Tue)	Strehle, Benjamin	510 (A05, Sun), 559 (A05, Tue)	Sung, Bong-Joon	233 (A02, Mon)
Spencer, Michael	488 (A04, Wed)	Strelchuk, V.	42 (A01, Mon)	Sung, Yung-Eun	631 (B01, Wed)
Spendelow, Jacob	1475 (I02, Sun), 1802 (I06, Tue)	Strmcnik, Dusan	1398 (I01, Mon), 1414 (I01, Tue), 1797 (I06, Tue), 1971 (L04, Mon)	Sung, Yung-Eun	1503 (I02, Mon), 1555 (I02, Wed)
Splawn, H.	1265 (H01, Mon)	Struck, Alexander	642 (B01, Thu)	Suntovich, Jin	1508 (I02, Mon), 1583 (I03, Sun), 1707 (I05, Mon)
Spoerke, Erik	454 (A03, Wed)	Struk, Daniel	2120 (M03, Thu)	Supakul, Skye	1778 (I05, Thu)
Sporea, Radu	1256 (G03, Wed)	Strøm-Hansen, Patrick	1069 (F01, Wed)		
Spray, Ryan	565 (A06, Mon)				
Spree, Lukas	785 (B05, Mon)				
Sprenkle, Vincent	134 (A02, Sun), 179 (A02, Mon), 379 (A02, Thu), 456 (A03, Wed)				
Spurgeon, Joshua	1623 (I03, Tue)				

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Surendran, Vishnu	32 (A01, Mon), 298 (A02, Wed)	Tal-Gutelmacher, Ervin	1830 (I06, Wed)	Teramura, Kentaro	883 (B07, Tue)
Surya Prakash, G.	408 (A03, Mon)	Talebian, Milad	998 (C01, Tue)	Teranishi, Toshiharu	876 (B07, Mon)
Sussuchi, Eliana	2043 (M01, Wed), 2045 (M01, Wed), 2068 (M02, Wed)	Talley, Derrick A.	1445 (I01, Wed)	Terekhov, Alexander	1480 (I02, Sun)
Suviresh, Arya	32 (A01, Mon), 298 (A02, Wed)	Tamašauskaitė-Tamašiūnaitė, Loreta	612 (B01-09, Tue), 612 (B01, Tue), 1063 (E01, Wed), 1530 (I02, Tue), 1531 (I02, Tue), 1556 (I02, Wed), 1558 (I02, Wed)	Terrones, Mauricio	757 (B04, Thu), 804 (B06, Sun)
Suwa, Tomoyuki	1228 (G02, Wed)	Tambio, Sacris Jeru	537 (A05, Mon)	Terrones, Mauricio	756 (B04, Thu), 831 (B06, Tue)
Suzuki, Hidenao	1050 (E01, Wed)	Tamgadge, Rupesh	618 (B01-09, Tue), 618 (B01, Tue)	Tewari, Deepti	369 (A02, Thu)
Suzuki, Naoki	1623 (A01, Mon)	Tamir, Gal	1830 (I06, Wed)	Teymouri, Ali	2242 (Z02, Mon)
Suzuki, Ryu	1423 (I01, Tue)	Tan, Chao	2001 (M01, Mon), 2098 (M03, Wed), 2106 (M03, Wed), 2107 (M03, Wed)	Thakkar, Foram	1130 (F04, Tue)
Suzuki, Shinya	880 (B07, Mon)	Tan, Chia-Ying	2033 (M01, Wed)	Thalluri, Sitaramanjaneva	1640 (I03, Tue)
Suzuki, Takahisa	1806 (I06, Tue)	Tan, Chun	64 (A01, Tue)	Thanapititkul, Piyathip	50 (A01, Tue)
Suzuki, Tomoya	1493 (I02, Sun)	Tan, Chun	512 (A05, Sun), 518 (A05, Sun), 543 (A05, Mon)	Thangadurai, Venkataraman	2088 (M03, Wed)
Suzuki, Wataru	902 (B08, Tue)	Tan, Darren	1772 (I05, Thu)	Thangavel, Naresh	2039 (M01, Wed)
Svedruzic, Drazenka	636 (B01, Wed)	Tan, Hoe	1706 (I05, Mon)	Thapaliya, Bishnu	248 (A02, Tue)
Svensden, Winnie	2021 (M01, Wed)	Tan, Hongyi	1430 (I01, Wed), 1452 (I01, Wed)	Thénaux-Vignon, Suzon	1377 (H03, Wed)
Svensen, Alexander	111 (A02, Sun)	Tan, Jeannie	1705 (I05, Mon)	Therkildsen, Kasper	1069 (F01, Wed)
Svensson, Ann Mari	318 (A02, Wed), 363 (A02, Thu)	Tan, Jinwang	92 (A01, Thu)	Thiede, Sebastian	367 (A02, Thu)
Švorc, Lubomír	2044 (M01, Wed)	Tan, Tian	288 (A02, Tue), 328 (A02, Wed)	Thivel, Pierre-Xavier	546 (A05, Mon), 557 (A05, Tue)
Swain, Greg	1938 (L02, Tue)	Tanabe, Toyokazu	2139 (Z01, Tue), 2140 (Z01, Tue)	Thodla, Ramgopal	1025 (C01, Wed)
Swain, Greg	1983 (L04, Tue)	Tanak, Ambalika	2105 (M03, Wed)	Thomas, Bradley	2030 (M01, Wed)
Swaminathan, Narasimhan	102 (A01, Thu)	Tanaka, Kentaro	938 (B08, Wed)	Thomas, Chadrelle	871 (B07, Mon)
Sweet, Andrew	1424 (A01, Tue)	Tanaka, Shunsuke	741 (B03, Wed)	Thomas, Jayan	645 (B01, Thu), 1985 (L04, Tue)
Symes, Mark	1925 (L01, Wed)	Tanaka, Takeshi	745 (B03, Wed)	Thomas, Melonie	1591 (I03, Sun)
Szabo, Aron	1182 (G01, Tue)	Tang, Jianguo	802 (B06, Sun)	Thomas, Michael	947 (B08, Thu)
Szabó, Gábor	808 (B06, Sun)	Tang, Jianshi	1165 (G01, Mon)	Thomas, Michael	584 (A06, Tue)
Szacilowski, Konrad	1550 (I02, Wed)	Tang, Jing	1849 (K01, Mon), 1909 (L01, Tue)	Thomas, Morgan	259 (A02, Tue)
Szkopek, Thomas	834 (B06, Tue), 852 (B01-09, Tue), 852 (B06, Tue)	Tang, Ming	94 (A01, Thu), 475 (A04, Wed), 482 (A04, Wed), 484 (A04, Wed)	Thomas, Randal	1000 (C01, Tue)
Szwejkowski, Chester	1281 (H01, Tue)	Tang, PengYi	1613 (I03, Mon)	Thomas, Sabu	1876 (K03, Wed)
		Tang, Yifan	394 (A02, Thu), 597 (A06, Wed)	Thomitzek, Matthias	367 (A02, Thu)
		Tang, Yuanjie	1028 (C01, Wed), 1029 (C01, Wed)	Thompson, Jonathan	1223 (G02, Wed)
		Taniguchi, Yukinori	529 (A05, Mon)	Thompson, Levi	1504 (I02, Mon)
		Tanim, Tanvir	595 (A06, Wed)	Thompson, Simon	1820 (I06, Wed)
		Taning, Ahmad Zulfikri	1542 (I02, Wed)	Thompson, Zach	977 (C01, Mon)
		Tao, Greg	1690 (I04, Tue)	Thomson, Ed	417 (A03, Tue)
		Tao, Meng	2063 (M02, Wed)	Thorne, David	36 (A01, Mon)
		Tapily, Kandabara	1167 (G01, Mon)	Thundat, Thomas	2123 (M03, Thu)
		Tardif, Samuel	540 (A05, Mon)	Tian, Bozhi	1336 (H02, Wed)
		Tarlekar, Pravin	2081 (M03, Tue)	Tian, Min	1177 (G01, Mon)
		Tarverne, Tyler	474 (A04, Wed)	Tian, Yang	477 (A04, Wed)
		Tasca, Federico	763 (B04, Thu)	Tian, Yumeng	1457 (I01, Wed)
		Tateyama, Yoshitaka	388 (A02, Thu)	Tian, Zheng	801 (B01-09, Tue), 801 (B05, Tue)
		Tatsumi, Ryouta	401 (A03, Mon)	Tibbits, Gretchen	2002 (M01, Mon)
		Tavakoli Mehrabadi, Bahareh Alsadat	1526 (I02, Tue)	Tiede, David	1660 (I03, Thu)
		Tavares, Ana	1978 (L04, Tue)	Tiginyanu, Ion	1276 (H01, Tue)
		Tavares, Ana	1984 (L04, Tue)	Timoshenko, Vadim	415 (A03, Mon)
		Tawfik, Samar	572 (A06, Mon)	Ting, Chao-Wei	1287 (H01, Tue)
		Taylor, Aidan	1867 (K02, Tue)	Tiwari, Devendra	2062 (M02, Wed)
		Taylor, E.	966 (B09, Wed), 1099 (F02, Mon)	Tiwari, Sabyasachi	1192 (G01, Wed)
		Tazaki, Akito	1869 (K02, Tue)	Todorov, Teodor	58 (A01, Tue), 1165 (G01, Mon)
		Tchemychova, Elena	53 (A01, Tue), 62 (A01, Tue)	Tohji, Kazuyuki	2199 (Z01, Tue)
		Teabnamang, Pemika	4 (A01, Sun)	Tokranov, Vadim	1352 (H02, Wed)
		Tee, Benjamin	1353 (H03, Tue)	Tokuda, Shoichi	885 (B07, Tue)
		Teeter, Glenn	252 (A02, Tue), 305 (A02, Wed)	Tokuoka, Satoshi	993 (C01, Tue)
		Teeter, Lucas	1000 (C01, Tue)	Tom, Robinson	2236 (Z01, Tue)
		Telgenhoff, Michael	1188 (G01, Tue)	Tomita, Motohiro	1197 (G01, Wed)
		Teller, Hanan	1528 (I02, Tue)	Tomita, Osamu	1634 (I03, Tue)
		Tembhurne, Saurabh	1635 (I03, Tue)	Tomiyama, Morio	285 (A02, Tue)
		Teng, Nan-Yuan	1342 (H02, Wed)	Tomon, Chanikarn	493 (A04, Thu)
		Tenhaeff, Wyatt	1244 (G03, Tue)	Toney, Michael	496 (A04, Thu)
		Tennant, Alan	1870 (K02, Tue)	Tong, Jianhua "Joshua"	1715 (I05, Tue)
		Teo, Linnette	372 (A02, Thu), 1154 (F04, Thu)	Tong, Wei	182 (A02, Mon), 307 (A02, Wed)
		Tepper, Katelyn	783 (B05, Mon), 784 (B05, Mon), 798 (B01-09, Tue), 798 (B05, Tue), 799 (B05, Tue), 799 (B01-09, Tue), 800 (B05, Tue), 800 (B01-09, Tue)	Tong, Xia (Linda)	1808 (I06, Tue)
		Teramoto, Akinobu	1228 (G02, Wed)	Tong, Xiao	1003 (C01, Tue)
				Toprak, Erdal	2094 (M03, Wed)
				Topsakal, Mehmet	536 (A05, Mon)
				Torimoto, Tsukasa	888 (B07, Tue)
				Torkghashghaei, Maryam	1005 (C01, Tue)
				Torres, Gabriel	589 (A06, Tue)
				Torres, Tomas	933 (B08, Wed)
				Torres-Castro, Loraine	23 (A01, Mon), 47 (A01, Tue), 577 (A06, Tue)
				Tortorelli, Dan	436 (A03, Tue)
				Tosha, Takehiko	1916 (L01, Wed)
				Toshimitsu, Fumiyuki	697 (B03, Mon), 703 (B03, Mon)
				Toth, Joseph	1683 (I04, Tue)

Author Index

Author	Abs No.
Tóth, Peter	808 (B06, Sun)
Tour, James	747 (B03, Wed), 967 (B09, Wed)
Tournon, Laurent	1253 (G03, Wed)
Townsend, Mark	1232 (G03, Tue)
Trainor, Andrew	1079 (F01, Wed)
Tran, Nu Huong	548 (A05, Mon)
Trapp, Marcus	541 (A05, Mon)
Trask, Stephen	254 (A02, Tue), 368 (A02, Thu)
Tremolet de Villers, Bertrand	636 (B01, Wed)
Tretiak, Sergei	717 (B03, Tue)
Trevani, Liliana	609 (B01, Tue), 609 (B01-09, Tue)
Trevey, James	311 (A02, Wed)
Trevino, Nicholas	2100 (M03, Wed)
Triana, Carlos	1992 (L04, Wed)
Trinidad, Francisco	1153 (F04, Thu)
Tripathi, Shalini	1699 (I05, Mon)
Troyk, Philip	1208 (G02, Tue)
Truong, Amber	1889 (L01, Mon)
Tryk, Donald	1798 (I06, Tue), 1956 (L03, Tue)
Tsai, Esther	1701 (I05, Mon)
Tsai, Meng-Che	1090 (F01, Thu), 1400 (I01, Mon), 1408 (I01, Tue)
Tsai, Miao-Chan	1273 (H01, Tue)
Tsai, Ming-Shih	1032 (D01, Tue)
Tsai, Wan-Yu	2261 (Z03, Mon)
Tsai, Yifen	599 (A06, Wed)
Tsavalas, John	2089 (M03, Wed)
Tsedev, Uyanga	701 (B03, Mon)
Tsuchida, Shuzo	2199 (Z01, Tue)
Tsuchiya, Hiroaki	993 (C01, Tue)
Tsuda, Masayuki	1019 (C01, Tue), 1023 (C01, Wed)
Tsuda, Takashi	2139 (Z01, Tue), 2140 (Z01, Tue)
Tsugawa, Wakako	1840 (K01, Mon), 1935 (L02, Tue), 2227 (Z01, Tue)
Tsunashima, Katsuhiko	671 (B02, Wed), 1097 (F01, Thu), 1869 (K02, Tue)
Tsushima, Shohji	1928 (L01, Wed)
Tsutsui, Kazuo	77 (A01, Wed), 1181 (G01, Tue), 1294 (H01, Wed)
Tsutsui, Yasumitsu	401 (A03, Mon)
Tu, Chia-Hang	981 (C01, Mon)
Tubtimkuna, Suchakree	494 (A04, Thu)
Tucker, Julie	995 (C01, Tue), 1000 (C01, Tue), 1001 (C01, Tue)
Tucker, Michael	11 (A01, Sun)
Tuckerman, Mark	1954 (L03, Tue), 1957 (L03, Tue)
Tuerxun, Feilure	388 (A02, Thu)
Tulej, Marek	1060 (E01, Wed)
Tumkur, Prathima Prabhu	2237 (Z01, Tue)
Tung, Vincent	1885 (L01, Mon)
Turner, John	1633 (I03, Tue)
Turney, Damon	506 (A04, Thu)
Turney, Damon	61 (A01, Tue)
Tutar, Secil	1838 (K01, Mon)
Tylczak, Joseph	1011 (C01, Tue), 1025 (C01, Wed)
Tzedakis, Theo	426 (A03, Tue), 1061 (E01, Wed)

U

Uchida, Hiroyuki	1798 (I06, Tue), 1956 (L03, Tue)
Uchida, Noriyuki	1184 (G01, Tue)
Uchimoto, Yoshiharu	388 (A02, Thu), 1551 (I02, Wed), 1572 (I02, Thu)
Uchiyama, Tomoki	388 (A02, Thu), 1551 (I02, Wed), 1572 (I02, Thu)
Uddin, Md.	1811 (I06, Tue)
Udwary, K.	1265 (H01, Mon)
Uematsu, Taro	888 (B07, Tue)
Ueno, Kazuhide	259 (A02, Tue)
Ugata, Yosuke	259 (A02, Tue)
Uhl, David	36 (A01, Mon)

Author	Abs No.
Ukumori, Nan	390 (A02, Thu)
Ulgut, Burak	54 (A01, Tue), 60 (A01, Tue)
Ulloa-Gomez, Ana-Maria	1930 (L02, Tue)
Ulloa-Severino, Antonio	177 (A02, Mon)
Ulsh, Michael	1506 (I02, Mon), 1512 (I02, Tue), 1536 (I02, Wed)
Ulvestad, Andrew	2262 (Z03, Mon)
Umezawa, Kota	1228 (G02, Wed)
Ummethala, Govind	2036 (M01, Wed)
Unal, Ugur	79 (A01, Wed)
Uosaki, Kohei	529 (A05, Mon), 2064 (M02, Wed)
Upasham, Sayali	1940 (L02, Tue), 2080 (M03, Tue)
Uppaluri, Maitri	1156 (F04, Thu)
Urbine, Jenifer	931 (B08, Wed)
Usseglio-Viretta, François	1136 (F04, Wed)
Uzundal, Can Berk	54 (A01, Tue), 60 (A01, Tue)

V

Vacandio, Florence	154 (A02, Mon), 303 (A02, Wed), 337 (A02, Wed)
Vaddiraju, Sreeram	892 (B07, Tue)
VahidMohammadi, Armin	2075 (M03, Tue)
Vaičiūniienė, Jūratė	612 (B01-09, Tue), 612 (B01, Tue), 1530 (I02, Tue), 1531 (I02, Tue), 1556 (I02, Wed), 1558 (I02, Wed)
Vaitkus, Rimantas	1556 (I02, Wed)
Vajeeston, Ponniah	70 (A01, Wed)
Valdez, Jesus	1984 (L04, Tue)
Vali, Abbas	1601 (I03, Sun)
Väli, Ronald	142 (A02, Sun)
Van Cleve, Timothy	1506 (I02, Mon)
van de Lagemaat, Jao	818 (B06, Mon)
Van de Put, Maarten	1192 (G01, Wed)
Van de Walle, Chris	860 (B07, Sun)
van Dorp, Dennis	1207 (G02, Tue), 2221 (Z01, Tue)
van Dorp, Dennis	1227 (G02, Wed)
van Eidsen, Jobert	1050 (E01, Wed)
van Werveke, Wouter	699 (B03, Mon)
Vandenbergh, William	1192 (G01, Wed)
Vangapattu, Ravi	1855 (K01, Mon)
Vankelecom, Ivo F. J.	2134 (Z01, Tue)
Vanýsek, Petr	1933 (L02, Tue)
Varadaraju, U. V.	87 (A01, Wed)
Varcoe, John	1734 (I05, Wed), 1825 (I06, Wed)
Vardner, Jonathan	433 (A03, Tue)
Varley, Joel	1627 (I03, Tue), 1965 (L03, Tue)
Varman, Arul Mozhy	2236 (Z01, Tue)
Vartanian, Maida	922 (B08, Wed)
Vasquez, Mariana	1880 (K03, Wed)
Vazquez, Ester	668 (B02, Wed)
Vázquez-Huerta, Gerardo	750 (B01-09, Tue), 750 (B04, Tue), 751 (B04, Tue), 751 (B01-09, Tue)
Vedarajan, Raman	1484 (I02, Sun)
Veerasubramani, Ganesh Kumar	192 (A02, Mon)
Vega, Reinaldo	1048 (E01, Wed)
Veith, Gabriel	20 (A01, Mon), 147 (A02, Mon), 335 (A02, Wed), 522 (A05, Sun), 526 (A05, Sun), 553 (A05, Tue)
Veleva, Lucien	985 (C01, Mon)
Velický, Matěj	833 (B06, Tue)
Velikokhatnyi, Oleg	48 (A01, Tue), 1434 (I01, Wed)
Velizhanin, Kirill	745 (B03, Wed)
Ventzek, Peter	1293 (H01, Wed)
Venugopalan, Gokul	1828 (I06, Wed)
Vera, Marcos	441 (A03, Wed)
Verbist, Guy	1130 (F04, Tue)
Verdier, Nina	68 (A01, Tue)
Vereecken, Philippe	148 (A02, Mon), 285 (A02, Tue)
Verma, Ankit	375 (A02, Thu)
Verma, Rakesh	230 (A02, Mon), 231 (A02, Mon)

Author	Abs No.
Verma, Sumit	1070 (F01, Wed)
Vetrone, Fiorenzo	2076 (M03, Tue)
Vezzù, Ketì	1739 (I05, Wed), 1801 (I06, Tue), 1989 (L04, Wed)
Viana, Bartolomeu	754 (B04, Tue), 754 (B01-09, Tue), 756 (B04, Thu)
Vicharra, Cristhian	156 (A02, Mon)
Vickers, James	1389 (I01, Mon)
Vickery, James	565 (A06, Mon)
Victor, Mauricio	2045 (M01, Wed)
Vidal, Judith	1540 (I02, Wed)
Vie, Preben	566 (A06, Mon)
Vigil-Fowler, Derek	820 (B06, Mon)
Vigneron, Jackie	1213 (G02, Tue), 1220 (G02, Wed), 1224 (G02, Wed)
Vijapur, Santosh	1099 (F02, Sun)
Vijayakumar, Amruthalakshmi	1579 (I03, Sun)
Vik, Ryan	941 (B08, Thu)
Vilela, Filipe	1705 (I05, Mon)
Vincenzi, Donato	251 (A02, Tue)
Vinchurkar, Madhuri	2022 (M01, Wed)
Vineesh, Thazhe	32 (A01, Mon), 298 (A02, Wed), 1409 (I01, Tue)
Vinet, Maud	1198 (G01, Wed)
Vinogradov, Sergei	945 (B08, Thu)
Virtanen, Sannakaisa	983 (C01, Mon)
Virya, Alvin	1517 (I02, Tue)
Viswanathan, Vish	372 (A02, Thu)
Vitale, Adam	639 (B01, Wed)
Viva, Federico	609 (B01, Tue), 609 (B01-09, Tue)
Vlasak, Paul	1098 (F02, Mon)
Vogel, Max	2153 (Z01, Tue)
Vogt, Leslie	1957 (L03, Tue)
Vohs, John	1725 (I05, Tue)
Voisin, Christophe	719 (B03, Tue), 743 (B03, Wed)
Voityuk, Alexander	775 (B05, Mon)
Volatron, Florence	1990 (L04, Wed)
Volkov, Alexey	740 (B03, Wed)
Volperts, Aleksandrs	1531 (I02, Tue)
Vonk, Donald	1003 (C01, Tue)
Voorhees, Peter	1721 (I05, Tue)
Voskanyan, Albert	428 (A03, Tue)
Voyantzis, Mitchell	2177 (Z01, Tue)
Vullev, Valentine	1241 (G03, Tue)
Vullum-Bruer, Frیده	125 (A02, Sun), 211 (A02, Mon), 296 (A02, Wed), 318 (A02, Wed), 329 (A02, Wed), 363 (A02, Thu), 816 (B06, Mon)
Vuong, Katrina	2220 (Z01, Tue)
Výprachtický, Drahomír	1251 (G03, Wed)

W

Wachtel, Ellen	2004 (M01, Tue)
Wäckerlin, Christian	920 (B08, Wed)
Wadsworth, Brian	931 (B08, Wed), 1638 (I03, Tue)
Waegle, Matthias	1920 (L01, Wed)
Wafula, Fred	1050 (E01, Wed)
Wagh, Nayantara	6 (A01, Sun), 35 (A01, Mon)
Wagner, Nils	211 (A02, Mon), 363 (A02, Thu)
Wagner, Norbert	1647 (I03, Wed)
Wahyudi, Wandi	227 (A02, Mon)
Wainright, Jesse	1077 (F01, Wed)
Wajda, Cory	1167 (G01, Mon)
Wakabayashi, Hitoshi	77 (A01, Wed), 838 (B06, Tue), 1181 (G01, Tue), 1294 (H01, Wed)
Wakasugi, Jungo	653 (B01, Thu)
Walczak, Karl	1637 (I03, Tue)
Waldeck, David	1298 (H02, Mon)
Waldecker, James	1539 (I02, Wed)
Waldrop, Krysta	1821 (I06, Wed)
Waldvogel, Siegfried	1092 (F01, Thu)
Walker, Marlon	1123 (F04, Tue)
Walker, Robert	1720 (I05, Tue), 1723 (I05, Tue)
Walker, Travis	1039 (D01, Tue)

Author Index

Author	Abs No.	Author	Abs No.	Author	Abs No.
Wall, Jessica	1052 (E01, Wed)	Wang, Jun	1457 (I01, Wed), 1776 (I05, Thu), 1998 (L04, Wed)	Watanuki, Shuei	2173 (Z01, Tue)
Wall, Nathalie	2002 (M01, Mon)	Wang, Kaiping	1237 (G03, Tue)	Watson, Venroy	97 (A01, Thu), 1939 (L02, Tue)
Wallace, Alexander	1925 (L01, Wed)	Wang, Kaiying	84 (A01, Wed), 85 (A01, Wed)	Watson, Venroy	59 (A01, Tue)
Wallace, Gordon	1579 (I03, Sun)	Wang, Ke-Hsuan	2269 (Z03, Mon)	Watts, Seth	436 (A03, Tue)
Wallace, Jean	1518 (I02, Tue)	Wang, Kuan	179 (A02, Mon)	Way, Austin	846 (B06, Tue), 847 (B06, Tue)
Wallace, Robert	1191 (G01, Wed)	Wang, Li	2270 (Z03, Mon)	Weatherspoon, Mark	98 (A01, Thu), 1939 (L02, Tue)
Waller, Gordon	73 (A01, Wed), 212 (A02, Mon), 338 (A02, Wed)	Wang, Lianqin	1825 (I06, Wed)	Weatherspoon, Mark	59 (A01, Tue), 97 (A01, Thu), 393 (A02, Thu)
Walter, Andrew	1867 (K02, Tue)	Wang, Lin	349 (A02, Thu)	Webb, Eric	1052 (E01, Wed)
Waltz-Chesnaye, Charles	710 (B03, Mon)	Wang, Mei-Ya	1537 (I02, Wed)	Webb, Lauren	2232 (Z01, Tue)
Waluyo, Iradwikanari	1996 (L04, Wed)	Wang, Min	1506 (I02, Mon), 1536 (I02, Wed)	Weber, Adam	1143 (F04, Wed)
Wampler, Wesley	2052 (M02, Wed)	Wang, Pei-Yao	2257 (Z03, Mon)	Wei, Bin	1389 (I01, Mon), 1462 (I01, Thu), 1502 (I02, Mon), 1590 (I03, Sun), 1637 (I03, Tue), 1832 (I06, Wed)
Wan, Charles	500 (A04, Thu)	Wang, Peng	714 (B03, Thu)	Weber, André	1119 (F03, Tue), 1752 (I05, Wed)
Wang, Andrew	1152 (F04, Thu)	Wang, Qi	1205 (G02, Tue)	Weber, Andrew	1852 (K01, Mon), 2000 (M01, Mon), 2094 (M03, Wed)
Wang, Anny	180 (A02, Mon), 485 (A04, Wed)	Wang, Rainey	409 (A03, Mon)	Webre, Whitney	937 (B08, Wed)
Wang, Bin	831 (B06, Tue)	Wang, Rongyue	1797 (I06, Tue)	Webre, Whitney	2216 (Z01, Tue)
Wang, Bowen	2164 (Z01, Tue)	Wang, Rongyue	1051 (E01, Wed)	Wee, Seokeun	1483 (I02, Sun)
Wang, Caiyun	1579 (I03, Sun)	Wang, Rui-Xing	1342 (H02, Wed)	Weeks, Jason	341 (A02, Wed)
Wang, Chao	1507 (I02, Mon)	Wang, Ruocun	501 (A04, Thu), 2261 (Z03, Mon)	Weeks, Jason	183 (A02, Mon)
Wang, Chao-Yang	397 (A02, Thu), 601 (A06, Wed)	Wang, Ruofan	11 (A01, Sun)	Weetom, Matthew	1939 (L02, Tue)
Wang, Chen-Hao	2115 (M03, Thu)	Wang, Shaoyang	1875 (K03, Wed), 1883 (K03, Wed)	Wei, Bin	2258 (Z03, Mon)
Wang, Chen-Hao	8 (A01, Sun)	Wang, Shengnan	988 (C01, Mon)	Wei, Max	1462 (I01, Thu)
Wang, Cheng	1395 (I01, Mon), 2203 (Z01, Tue)	Wang, Shin-Li	1303 (H02, Mon), 1309 (H02, Mon), 1312 (H02, Mon)	Wei, Tong	33 (A01, Mon)
Wang, Chenyu	1475 (I02, Sun)	Wang, Shuo	290 (A02, Tue)	Wei, Xiaoliang	445 (A03, Wed)
Wang, Chih-Wei	2033 (M01, Wed)	Wang, Siwen	45 (A01, Mon)	Wei, Xuexia	547 (A05, Mon)
Wang, Chongmin	257 (A02, Tue)	Wang, Teng	1824 (I06, Wed)	Weidner, John	293 (A02, Tue), 371 (A02, Thu), 1103 (F03, Tue), 1526 (I02, Tue)
Wang, Chuan-Jyun	1076 (F01, Wed), 1113 (F03, Tue)	Wang, Wang	1586 (I03, Sun), 1592 (I03, Sun)	Weinstock, Ira	1968 (L04, Mon)
Wang, Chuanlong	389 (A02, Thu), 604 (A06, Wed)	Wang, Wei	417 (A03, Tue), 423 (A03, Tue)	Weisgraber, Todd	436 (A03, Tue)
Wang, Chunlei	304 (A02, Wed), 656 (B01, Thu), 807 (B06, Sun)	Wang, Weijie	1285 (H01, Tue)	Weisman, R. Bruce	696 (B03, Mon), 701 (B03, Mon), 706 (B03, Mon), 715 (B03, Tue)
Wang, Chunmei	1539 (I02, Wed)	Wang, Wenhao	1644 (I03, Wed)	Weitzner, Stephen	1965 (L03, Tue)
Wang, Congjun	1996 (L04, Wed)	Wang, Wenxiao	1912 (L01, Tue)	Weker, Johanna	1694 (I05, Sun)
Wang, Dan	966 (B09, Wed)	Wang, Xiao	1254 (G03, Wed)	Welander, Märtha	1720 (I05, Tue), 1723 (I05, Tue)
Wang, Dunwei	1614 (I03, Mon)	Wang, Xiaoling	783 (B05, Mon)	Welborn, Samuel	349 (A02, Thu)
Wang, Fan	94 (A01, Thu), 484 (A04, Wed)	Wang, Xin	366 (A02, Thu)	Welch, Gregory	1233 (G03, Tue)
Wang, Fang	588 (A06, Tue)	Wang, Xudong	1321 (H02, Tue)	Weldekidan, Ephrem Terefe	150 (A02, Mon), 1111 (F03, Tue)
Wang, Feng	925 (B08, Wed)	Wang, Xuefeng	1767 (I05, Thu), 1772 (I05, Thu)	Wellala, Nadeesha	417 (A03, Tue)
Wang, Feng	857 (B07, Sun)	Wang, Xueyin	271 (A02, Tue)	Weller, Jon	464 (A04, Wed)
Wang, Fu-Ming	302 (A02, Wed)	Wang, Yafei	857 (B07, Sun)	Wen, Jianguo	1498 (I02, Mon)
Wang, George	1273 (H01, Tue)	Wang, Yanchang	1551 (I02, Wed)	Weng, Lien-Chun	1590 (I03, Sun)
Wang, Guan-Wu	772 (B05, Mon)	Wang, Yao	229 (A02, Wed)	Weng, Yu-Ting	166 (A02, Mon)
Wang, Guang-Ren	1076 (F01, Wed), 1113 (F03, Tue)	Wang, Yaofeng	789 (B05, Tue)	Wenseleers, Wim	699 (B03, Mon)
Wang, Guanxiong	1506 (I02, Mon), 1513 (I02, Tue)	Wang, Yi	2048 (M01, Wed)	Wenseleers, Wim	716 (B03, Tue)
Wang, Haihui	1674 (I04, Tue)	Wang, Ying	490 (A04, Wed)	Weret, Misganaw	128 (A02, Sun)
Wang, Haijiang	1680 (I04, Tue)	Wang, Yingge	84 (A01, Wed), 85 (A01, Tue)	West, Alan	433 (A03, Tue), 1122 (F04, Tue)
Wang, Han	56 (A01, Tue), 461 (A04, Wed)	Wang, Yu	581 (A06, Tue)	West, Anthony	480 (A04, Wed)
Wang, Hanyu	1870 (K02, Tue)	Wang, Yu-Lin	1299 (H02, Mon), 1301 (H02, Mon), 1303 (H02, Mon), 1309 (H02, Mon), 1312 (H02, Mon), 1317 (H02, Mon)	Westover, Andrew	147 (A02, Mon)
Wang, Hao	1443 (I01, Wed)	Wang, Yuchen	73 (A01, Wed), 96 (A01, Thu)	Wheeler, Daniel	1123 (F04, Tue)
Wang, Haotian	1509 (I02, Mon)	Wang, Yudong	1746 (I05, Wed)	Wheeler, Lance	863 (B07, Mon)
Wang, Hong	884 (B07, Tue), 907 (B01-09, Tue), 907 (B08, Tue), 913 (B08, Tue), 913 (B01-09, Tue), 915 (B08, Tue), 915 (B01-09, Tue), 947 (B08, Thu), 2216 (Z01, Tue)	Wang, YuHuang	711 (B03, Tue), 714 (B03, Tue), 733 (B03, Tue), 733 (B01-09, Tue)	Wheeler, Samuel	380 (A02, Thu)
Wang, Hongbo	444 (A03, Wed)	Wang, Zhaofen	1365 (H03, Tue)	Whitacre, Jay	56 (A01, Tue), 411 (A03, Mon), 461 (A04, Wed), 2171 (Z01, Tue), 2240 (Z02, Mon), 2246 (Z02, Mon)
Wang, Hongqian	12 (A01, Sun)	Wang, Zhaohui	816 (B06, Mon)	White, Henry	1908 (L01, Tue)
Wang, Huan	926 (B08, Wed)	Wang, Zhe	1886 (L01, Mon), 2124 (M03, Thu)	White, Michael	1040 (D01, Tue)
Wang, Huan	152 (A02, Mon), 389 (A02, Thu), 604 (A06, Wed)	Wang, Zhida	1430 (I01, Wed), 1452 (I01, Wed)	White, Ralph	371 (A02, Thu), 1399 (I01, Mon)
Wang, Hui	134 (A02, Sun)	Wang, Zhiming	1644 (I03, Wed)	Widlock, Mats	1094 (F01, Thu)
Wang, Huimin	382 (A02, Thu)	Wang, Zhiming	1617 (I03, Tue)	Wiederrecht, Gary	1659 (I03, Thu)
Wang, Jia	1522 (I02, Tue), 1688 (I04, Tue), 1799 (I06, Tue)	Wang, Zihao	1216 (G02, Tue)	Wieler, Matthias	1150 (F04, Wed), 1752 (I05, Wed)
Wang, Jianfang	1611 (I03, Mon)	Wang, Ziling	220 (A02, Mon)	Wiesendanger, Reto	1060 (E01, Wed)
Wang, Jie	319 (A02, Wed)	Wankmüller, Florian	1119 (F03, Tue), 1752 (I05, Wed)	Wiesner, Ulrich	1583 (I03, Sun)
Wang, Jin	1699 (I05, Mon)	Wanninayake, Namal	1591 (I03, Sun)	Wikel, Hanna	1214 (G02, Tue)
Wang, Jingjing	1054 (E01, Wed)	Wanting, Rong	1012 (C01, Tue)	Wikel, Kazimierz	1214 (G02, Tue)
Wang, Jingxin	83 (A01, Wed)	Warburton, Robert	332 (A02, Wed)	Wilcox, Kathryn	607 (A06, Wed)
Wang, Joesph	1374 (H03, Wed)	Warren, Roseanne	52 (A01, Tue)	Wilder, Logan	2232 (Z01, Tue)
Wang, Joseph	2083 (M03, Wed)	Washburn, Spenser	915 (B08, Tue), 915 (B01-09, Tue)	Wiley, Benjamin	1109 (F03, Tue), 1379 (I01, Sun)
		Watanabe, Daiki	259 (A02, Tue)	Wilhelm, Thomas	1216 (G02, Tue)
		Watanabe, Masahiro	1784 (I06, Mon)	Wilkinson, David	1534 (I02, Wed)
		Watanabe, Masayoshi	259 (A02, Tue)		
		Watanabe, Takanobu	1197 (G01, Wed)		
		Watanabe, Tatsuya	2140 (Z01, Tue)		

Author Index

Author.....	Abs No.	Author.....	Abs No.	Author.....	Abs No.
Yang, Gaoqiang.....	1437 (I01, Wed), 1445 (I01, Wed), 1480 (I02, Sun)	Yeo, Jia Bin.....	2241 (Z02, Mon)	Yu, Weilai.....	1202 (G02, Tue)
Yang, Guang.....	291 (A02, Tue), 305 (A02, Wed), 450 (A03, Wed), 451 (A03, Wed), 452 (A03, Wed), 522 (A05, Sun)	Yeom, Geun Young.....	1193 (G01, Wed)	Yu, Xingwen.....	122 (A02, Sun), 124 (A02, Sun), 446 (A03, Wed)
Yang, Guoqiang.....	986 (C01, Mon)	Yi, Chen Kai.....	1283 (H01, Tue)	Yu, Xuecheng.....	2077 (M03, Tue)
Yang, Hui.....	176 (A02, Mon), 1770 (I05, Thu)	Yi, Eongyu.....	71 (A01, Wed)	Yu, Yan.....	137 (A02, Sun)
Yang, Hun-Mo.....	1166 (G01, Mon), 1169 (G01, Mon)	Yi, William.....	978 (C01, Mon)	Yu, Yang.....	1996 (L04, Wed)
Yang, Jiancheng.....	1261 (H01, Mon), 1264 (H01, Mon), 1269 (H01, Mon), 2082 (M03, Tue)	Yildiz, Ozkan.....	488 (A04, Wed)	Yu, Ying.....	2135 (Z01, Tue)
Yang, Jianzhong.....	262 (A02, Tue)	Yilmaz Akkaya, Ceren.....	79 (A01, Wed)	Yu, Yun.....	774 (B05, Mon)
Yang, Jihui.....	1211 (G02, Tue)	Yin, Hacheng.....	2106 (M03, Wed)	Yua, Jiahao.....	1995 (L04, Wed)
Yang, Jingfang.....	271 (A02, Tue)	Yin, Huaxiang.....	1174 (G01, Mon), 1175 (G01, Mon)	Yuan, Bo.....	2257 (Z03, Mon)
Yang, Jou-Wen.....	2050 (M01, Wed)	Yin, Wenyan.....	2042 (M01, Wed)	Yuan, Mengwei.....	52 (A01, Tue)
Yang, Jun.....	1539 (I02, Wed)	Yin, Xi.....	1429 (I01, Wed), 1489 (I02, Sun)	Yuan, Yan.....	110 (A02, Sun)
Yang, Kaiqi.....	94 (A01, Thu), 482 (A04, Wed)	Yin, Yanli.....	305 (A02, Wed)	Yuan, Zhibo.....	1046 (D01, Wed)
Yang, Ki Dong.....	2241 (Z02, Mon)	Yin, Zhijian.....	1696 (I05, Sun)	Yudi, Yudi.....	317 (A02, Wed)
Yang, Kunli.....	12 (A01, Sun)	Yllö, Are.....	1943 (L03, Mon)	Yue, Xiping.....	2124 (M03, Thu)
Yang, Kyung Chae.....	1193 (G01, Wed)	Yoda, Takashi.....	1294 (H01, Wed)	Yuede, Nicole.....	2194 (Z01, Tue)
Yang, Mo.....	1046 (D01, Wed)	Yogendra, Karthik.....	1048 (E01, Wed)	Yuh, Chao-Yi.....	13 (A01, Sun)
Yang, Peixia.....	594 (A06, Tue)	Yokota, Tomoyuki.....	1362 (H03, Tue)	Yum, Kyungsuk.....	679 (B02, Thu)
Yang, Rongfang.....	2108 (M03, Wed)	Yokoyama, Kouji.....	1551 (I02, Wed)	Yumak, Tugrul.....	83 (A01, Wed)
Yang, Rung-Je.....	1032 (D01, Tue)	Yokoyama, Shun.....	2199 (Z01, Tue)	Yun, Dong-Jin.....	523 (A05, Sun), 1593 (I03, Sun)
Yang, Rusen.....	1320 (H02, Tue)	Yomogida, Yohei.....	745 (B03, Wed)	Yun, JaeHyung.....	1835 (K01, Mon)
Yang, Seung-Hoon.....	196 (A02, Mon)	Yoo, Bongyoung.....	1231 (G02, Wed)	Yun, Seok Joon.....	820 (B06, Mon)
Yang, Shangfeng.....	796 (B05, Tue), 797 (B05, Tue), 797 (B01-09, Tue)	Yoo, Bongyoung.....	1056 (E01, Wed)	Yurgelevic, Sally.....	2039 (M01, Wed)
Yang, Shaoxuan.....	925 (B08, Wed)	Yoo, Bung-Uk.....	2169 (Z01, Tue), 2170 (Z01, Tue)	Yurkiy, Vitaliy.....	603 (A06, Wed), 606 (A06, Wed)
Yang, Shenglin.....	1761 (I05, Wed)	Yoo, Hyun.....	386 (A02, Thu)	Yurtsever, Aycan.....	1984 (L04, Tue)
Yang, Shihe.....	1910 (L01, Tue), 2211 (Z01, Tue)	Yoo, Hyundong.....	207 (A02, Mon)	Yurtsever, Aycan.....	1615 (I03, Mon)
Yang, Shu-Meng.....	1287 (H01, Tue)	Yoo, Ji Mun.....	631 (B01, Wed), 1555 (I02, Wed)	Yushin, Gleb.....	963 (B09, Wed)
Yang, Wanli.....	307 (A02, Wed)	Yoo, Ji-Beom.....	491 (A04, Wed)		
Yang, Wei.....	789 (B05, Tue)	Yoon, Chang-Ro.....	1176 (G01, Mon)	Z	
Yang, Xiao-Guang.....	397 (A02, Thu)	Yoon, Chong seung.....	312 (A02, Wed)	Zabara, Mohammed.....	54 (A01, Tue)
Yang, Xiao-Yu.....	774 (B05, Mon)	Yoon, Ilsun.....	1471 (I01, Thu)	Zabielaitė, Aušrinė.....	1558 (I02, Wed)
Yang, Xiaoguang.....	1084 (F01, Wed), 1086 (F01, Wed)	Yoon, Jaesik.....	2047 (M01, Wed), 2048 (M01, Wed)	Zabielaitė, Aušrinė.....	1530 (I02, Tue), 1556 (I02, Wed)
Yang, Xiaoxiao.....	1761 (I05, Wed)	Yoon, Jaesik.....	2075 (M03, Tue)	Zabinski, Piotr.....	1387 (I01, Sun), 1413 (I01, Tue), 2174 (Z01, Tue)
Yang, Xiulin.....	1885 (L01, Mon)	Yoon, Su-Jung.....	1280 (H01, Tue)	Zaccaria, R.....	251 (A02, Tue)
Yang, Yoona.....	693 (B03, Mon)	Yoon, Taeho.....	305 (A02, Wed)	Zaccarine, Sarah.....	1422 (I01, Tue)
Yang, Z. Gary.....	402 (A03, Mon)	Yoon, Wongeun.....	1751 (I05, Wed)	Zachariassen, Marley.....	1723 (I05, Tue)
Yang, Zhiwei.....	435 (A03, Tue)	Yoon, Young Soo.....	2047 (M01, Wed), 2048 (M01, Wed), 2075 (M03, Tue)	Zagal, Jose.....	763 (B04, Thu), 764 (B04, Thu)
Yang-Neyerlin, Ami.....	1536 (I02, Wed)	Yorioka, Takuya.....	1217 (G02, Tue)	Zaghib, Karim.....	272 (A02, Tue), 1766 (I05, Thu)
Yanjing, Tuo.....	1012 (C01, Tue)	Yoshida, Jun.....	14 (A01, Mon)	Zaghib, Karim.....	272 (A02, Tue), 1766 (I05, Thu)
Yano, Hiroshi.....	1798 (I06, Tue), 1956 (L03, Tue)	Yoshida, Kazuki.....	2181 (Z01, Tue)	Zamkov, Mikhail.....	1605 (I03, Mon)
Yao, Jiaxin.....	1174 (G01, Mon), 1175 (G01, Mon)	Yoshida, Masaaki.....	1923 (L01, Wed)	Zana, Alessandro.....	1554 (I02, Wed)
Yao, Takeshi.....	2143 (Z01, Tue)	Yoshida, Masamichi.....	1432 (I01, Wed)	Zango, German.....	933 (B08, Wed)
Yao, Yan.....	473 (A04, Wed), 1131 (F04, Tue), 1771 (I05, Thu), 2205 (Z01, Tue)	Yoshimura, Masamichi.....	1432 (I01, Wed)	Zanotti, Gloria.....	923 (B08, Wed)
Yao, Yao.....	1680 (I04, Tue)	Yoshitake, Michiko.....	1097 (F01, Thu)	Zapata Dominguez, Diana.....	540 (A05, Mon)
Yarali, Miad.....	1891 (L01, Mon)	Yoshizawa, Kazunari.....	902 (B08, Tue)	Zarrin, Hossein.....	2239 (Z02, Mon)
Yarlagadda, Venkata.....	1504 (I02, Mon)	You, Hoydoo.....	1887 (L01, Mon), 2262 (Z03, Mon)	Zatsikha, Yuriy.....	944 (B08, Thu)
Yashiro, Hitoshi.....	355 (A02, Thu), 1064 (E01, Wed)	Youn, Donghan.....	205 (A02, Mon), 207 (A02, Mon), 255 (A02, Tue)	Zaumseil, Jana.....	698 (B03, Mon), 726 (B03, Tue), 736 (B03, Wed), 743 (B03, Wed), 1240 (G03, Tue)
Yashiro, Nobuyoshi.....	163 (A02, Mon)	Young, Alan.....	1552 (I02, Wed)	Zavada, John.....	1278 (H01, Tue)
Yasko, Andrey.....	1951 (L03, Mon)	Young, James.....	1540 (I02, Wed), 1541 (I02, Wed), 1632 (I03, Tue), 1633 (I03, Tue), 1641 (I03, Wed)	Zavadil, Kevin.....	350 (A02, Thu), 351 (A02, Thu)
Yasuda, Kensuke.....	880 (B07, Mon)	Young, Jeanette.....	1188 (G01, Tue)	Zavala, Caleb.....	198 (A02, Mon)
Yasufumi, Takahashi.....	2259 (F03, Mon)	Yourey, William.....	182 (A02, Mon), 1083 (F01, Wed)	Zavatski, Starhei.....	1349 (H02, Wed)
Yasuzawa, Mikito.....	2115 (M03, Thu)	Yu, Aiping.....	955 (B09, Tue), 955 (B01-09, Tue), 956 (B09, Tue), 956 (B01-09, Tue), 958 (B09, Wed), 971 (B09, Thu), 972 (B09, Thu)	Zawacky, Steve.....	1079 (F01, Wed)
Ye, Jing.....	1093 (F01, Thu)	Yu, Cheng-Han.....	2144 (Z01, Tue)	Zawodzinski, Thomas.....	430 (A03, Tue), 432 (A03, Tue), 1141 (F04, Wed), 1743 (I05, Wed), 1790 (I06, Mon)
Ye, Peide.....	1180 (G01, Tue), 1270 (I01, Mon)	Yu, Chengbing.....	1027 (C01, Wed), 1029 (C01, Wed)	Zawodzinski, Thomas.....	459 (A03, Wed), 1570 (I02, Thu)
Ye, Yifan.....	1593 (I03, Sun)	Yu, Denis.....	229 (A02, Mon), 328 (A02, Wed)	Zayat, Billal.....	2200 (Z01, Tue)
Ye, Zongbiao.....	857 (B07, Sun)	Yu, Denis.....	288 (A02, Tue), 382 (A02, Thu)	Zazpe, Raul.....	837 (B06, Tue), 2060 (M02, Wed)
Yeang, Andrew.....	21 (A01, Mon)	Yu, Denis.....	470 (A04, Wed)	Zbořil, Radek.....	1607 (I03, Mon), 1667 (I03, Thu)
Yeboah, Yaw.....	59 (A01, Tue), 97 (A01, Thu)	Yu, Denis Y. W.....	290 (A02, Tue)	Zeis, Roswitha.....	1117 (F03, Tue)
Yee, Minha.....	187 (A02, Mon)	Yu, Han.....	34 (A01, Mon)	Zekoll, Stefanie.....	558 (A05, Tue)
Yeh, Cheng.....	1310 (H02, Mon)	Yu, Haoran.....	1521 (I02, Tue), 1532 (I02, Wed), 1549 (I02, Wed)	Zeleke, Tamene Simachew.....	1090 (F01, Thu), 1400 (I01, Mon)
Yeh, J. Andrew.....	1351 (H02, Wed)	Yu, Jing.....	1457 (I01, Wed)	Zelenay, Piotr.....	1429 (I01, Wed), 1489 (I02, Sun), 1499 (I02, Mon), 1500 (I02, Mon), 1803 (I06, Tue)
Yeh, Tsung-Kuang.....	1537 (I02, Wed)	Yu, Jing.....	1464 (I01, Thu)	Zelovich, Tamar.....	1954 (L03, Tue)
Yen, Cheng-Wei.....	1283 (H01, Tue), 1286 (H01, Tue)	Yu, Jun Ho.....	1176 (G01, Mon)	Zelovich, Tamar.....	1957 (L03, Tue)
Yen, Hung-Wei.....	990 (C01, Mon)	Yu, Nancy.....	1364 (H03, Tue)	Zeng, Qunfeng.....	988 (C01, Mon), 1004 (C01, Tue)
Yen, Shi-Chern.....	27 (A01, Mon)	Yu, Shule.....	1437 (I01, Wed)	Zeng, Zhenhua.....	1546 (I02, Wed)
Yenugu, Veera Manohara Reddy.....	2044 (M01, Wed)	Yu, Shule.....	1445 (I01, Wed), 1480 (I02, Sun)	Zeng, Zhipeng.....	269 (A02, Tue)
Yeo, Boon Siang.....	1668 (I03, Thu), 1709 (I05, Mon)	Yu, Tae Yeon.....	224 (A02, Mon)	Zeng, Zhiyuan.....	135 (A02, Sun)
Yeo, Hyewon.....	462 (A04, Wed)				

Author Index

Author.....	Abs No.	Author.....	Abs No.	Author.....	Abs No.
Zenkov, Yegor.....	931 (B08, Wed)	Zhang, Shumao.....	1189 (G01, Tue)	Zheng, Yu.....	701 (B03, Mon), 706 (B03, Mon)
Zenyuk, Iryna.....	1103 (F03, Tue), 1143 (F04, Wed), 1697 (I05, Sun), 1831 (I06, Wed), 1889 (L01, Mon)	Zhang, Tengfei.....	1548 (I02, Wed)	Zheng, Qiang.....	1313 (H02, Mon)
Zequine, Camila.....	36 (A01, Mon)	Zhang, Tierui.....	1599 (I03, Sun)	Zhiyang, Qin.....	1188 (G01, Tue)
Zerze, Gul.....	721 (B03, Tue)	Zhang, Wei-Wei.....	2257 (Z03, Mon)	Zhong, Huicai.....	1177 (G01, Mon)
Zhan, Cheng.....	832 (B06, Tue), 1066 (F01, Wed)	Zhang, Weiran.....	1420 (I01, Tue)	Zhong, Shenghong.....	1885 (L01, Mon)
Zhan, Tianzhuo.....	1197 (G01, Wed)	Zhang, Xiaotian.....	836 (B06, Tue)	Zhou, Chong.....	1 (A01, Sun)
Zhan, Xiaowen.....	456 (A03, Wed)	Zhang, Xie.....	860 (B07, Sun)	Zhou, Guihua.....	1300 (H02, Mon)
Zhang, Boyuan.....	627 (B01, Wed)	Zhang, Xuelin.....	1563 (I02, Wed)	Zhou, Hong.....	1270 (H01, Mon)
Zhang, Chao.....	1943 (L03, Mon)	Zhang, Yingchun.....	871 (B07, Mon)	Zhou, Hongyao.....	472 (A04, Wed)
Zhang, Chen.....	73 (A01, Wed), 96 (A01, Thu)	Zhang, Yanliang.....	1324 (H02, Tue)	Zhou, Jie.....	1143 (F04, Wed)
Zhang, Chengxiao.....	2071 (M03, Tue)	Zhang, Yiman.....	314 (A02, Wed), 316 (A02, Wed)	Zhou, Ming.....	428 (A03, Tue)
Zhang, Chengxu.....	1101 (F02, Mon), 1448 (I01, Wed), 1557 (I02, Wed), 1763 (I05, Wed)	Zhang, Ying.....	547 (A05, Mon)	Zhou, Ruifeng.....	1610 (I03, Mon)
Zhang, Chi.....	1145 (F04, Wed)	Zhang, Yongchun.....	1086 (F01, Tue)	Zhou, Ting.....	472 (A04, Wed)
Zhang, Cunman.....	1453 (I01, Wed), 2243 (Z02, Mon)	Zhang, Yongfeng.....	995 (C01, Tue), 1001 (C01, Tue)	Zhou, Xiangyang.....	1453 (I01, Wed)
Zhang, Fen.....	1710 (I05, Mon)	Zhang, Youtian.....	475 (A04, Wed)	Zhou, Xiangyang.....	73 (A01, Wed), 96 (A01, Thu)
Zhang, Feng-Yuan.....	1431 (I01, Wed), 1437 (I01, Wed), 1445 (I01, Wed), 1480 (I02, Sun)	Zhang, Youtian.....	94 (A01, Thu)	Zhou, Xiao-Dong.....	1746 (I05, Wed), 1773 (I05, Thu)
Zhang, Guangsheng.....	573 (A06, Mon)	Zhang, Yu.....	501 (A04, Thu)	Zhou, Xiaobing.....	1188 (G01, Tue)
Zhang, Guojun.....	1297 (H02, Mon)	Zhang, Yueheng.....	2171 (Z01, Tue)	Zhou, Yue.....	471 (A04, Wed), 2146 (Z01, Tue)
Zhang, Guoqing.....	41 (A01, Mon)	Zhang, Yufeng.....	1563 (I02, Wed)	Zhou, Yunyun.....	1996 (L04, Wed)
Zhang, Hanguang.....	1490 (I02, Sun), 1811 (I06, Tue)	Zhang, Yujia.....	1395 (I01, Mon)	Zhou, Zhongqiang.....	900 (B08, Tue)
Zhang, Hanyu.....	818 (B06, Mon)	Zhang, Yunzhu.....	431 (A03, Tue)	Zhu, Changxiong.....	1093 (F01, Thu)
Zhang, Heng.....	153 (A02, Mon)	Zhang, Yuteng.....	2231 (Z01, Tue)	Zhu, Di.....	1776 (I05, Thu)
Zhang, Hongzhang.....	2135 (Z01, Tue)	Zhang, Yuwei.....	395 (A02, Thu)	Zhu, Haoyue.....	804 (B06, Sun)
Zhang, Huamin.....	444 (A03, Wed), 2134 (Z01, Tue)	Zhang, Yuzhi.....	533 (A05, Mon)	Zhu, Hongli.....	421 (A01, Wed), 425 (A03, Tue), 630 (B01, Wed)
Zhang, Ji-Guang.....	167 (A02, Mon), 171 (A02, Mon)	Zhang, Zhengcheng.....	262 (A02, Tue)	Zhu, Hui.....	2243 (Z02, Mon)
Zhang, Jianbo.....	596 (A06, Wed)	Zhang, Zhengcheng.....	258 (A02, Tue), 292 (A02, Tue)	Zhu, Min.....	322 (A02, Wed)
Zhang, Jiayi.....	1415 (I01, Tue)	Zhang, Zhengping.....	925 (B08, Wed)	Zhu, Runfan.....	442 (A03, Wed)
Zhang, Jingjing.....	445 (A03, Wed)	Zhang, Zipin.....	939 (B08, Thu)	Zhu, Shangqian.....	1656 (I03, Thu)
Zhang, Jingxin.....	1481 (I02, Sun)	Zhao, Benzong.....	1741 (I05, Wed)	Zhu, Yanfeng.....	1014 (C01, Tue)
Zhang, Jinjiang.....	1610 (I03, Mon)	Zhao, Bin.....	292 (A02, Tue)	Zhu, Yaqi.....	1160 (F04, Thu)
Zhang, Junying.....	1595 (I03, Sun)	Zhao, Chonghang.....	536 (A05, Mon)	Zhu, Ye.....	160 (A02, Mon)
Zhang, Kai.....	129 (A02, Sun)	Zhao, Haijun.....	444 (A03, Wed)	Zhu, Yimei.....	1522 (I02, Tue)
Zhang, Kun.....	996 (C01, Tue), 997 (C01, Tue), 1022 (C01, Wed), 1027 (C01, Wed), 1029 (C01, Wed)	Zhao, Hailei.....	319 (A02, Wed)	Zhu, Zhenghao.....	1815 (I06, Wed)
Zhang, Linchao.....	171 (A02, Mon)	Zhao, Hongbo.....	1140 (F04, Wed)	Zhuang, Jiabin.....	789 (B05, Tue), 790 (B05, Tue)
Zhang, Linghong.....	646 (B01, Thu)	Zhao, Jiangming.....	999 (C01, Tue)	Zhukov, Tatyana.....	2102 (M03, Wed)
Zhang, Long.....	88 (A01, Wed)	Zhao, Jianzhang.....	946 (B08, Thu)	Zhuo, Mingzhao.....	1944 (L03, Mon), 1945 (L03, Mon)
Zhang, Lu.....	445 (A03, Wed)	Zhao, Jiyong.....	1499 (I02, Mon)	Zi, Yunlong.....	1318 (H02, Tue)
Zhang, Lulu.....	1401 (I01, Mon)	Zhao, Kejie.....	267 (A02, Tue), 478 (A04, Wed)	Ziegler, Kirk.....	1775 (I05, Thu)
Zhang, Maiwen.....	955 (B09, Tue), 955 (B01-09, Tue), 956 (B09, Tue), 956 (B01-09, Tue), 971 (B09, Thu), 972 (B09, Thu)	Zhao, Shen.....	719 (B03, Tue)	Ziino, Emily.....	1872 (K03, Wed)
Zhang, Milin.....	1988 (L04, Tue), 2042 (M01, Wed)	Zhao, Shenyi.....	2141 (Z01, Tue)	Ziomek-Moroz, Margaret.....	1000 (C01, Tue), 1011 (C01, Tue), 1025 (C01, Wed), 2017 (M01, Tue), 2018 (M01, Tue)
Zhang, Qi.....	1646 (I03, Wed)	Zhao, Xu.....	1436 (I01, Wed)	Zobel, Mirijam.....	67 (A01, Tue), 95 (A01, Thu)
Zhang, Qian.....	1721 (I05, Tue)	Zhao, Xuanhe.....	1361 (H03, Tue)	Zondlo, John.....	83 (A01, Wed)
Zhang, Qichun.....	866 (B07, Mon)	Zhao, Yong.....	1579 (I03, Sun)	Zornitta, Rafael.....	1067 (F01, Wed)
Zhang, Qinghua.....	1561 (I02, Wed), 2097 (M03, Wed)	Zhao, Yuetao.....	857 (B07, Sun)	Zou, Jianxin.....	1498 (I02, Mon)
Zhang, Rui.....	113 (A02, Sun)	Zhao, Zeqiong.....	2056 (M02, Wed)	Zou, Lu.....	220 (A02, Mon)
Zhang, Ruixian.....	354 (A02, Thu)	Zhao, Zeyu.....	1715 (I05, Tue)	Zou, Minda.....	1715 (I05, Tue)
Zhang, Ruofan.....	2243 (Z02, Mon)	Zhao-Karger, Zhirong.....	353 (A02, Thu)	Zou, Shouzhong.....	1123 (F04, Tue)
Zhang, Shan-Lin.....	1719 (I05, Tue)	Zheng, Dongdong.....	110 (A02, Sun)	Zubi, Tala.....	2162 (Z01, Tue), 2163 (Z01, Tue)
Zhang, Shanlin.....	12 (A01, Sun)	Zheng, Jim.....	59 (A01, Tue)	Zubkovs, Vitalijs.....	661 (B01-09, Tue), 661 (B02, Tue), 684 (B02, Thu), 728 (B03, Tue), 728 (B01-09, Tue), 729 (B03, Tue), 729 (B01-09, Tue)
		Zheng, Jim.....	97 (A01, Thu)	Zulevi, Barr.....	1461 (I01, Thu), 1487 (I02, Sun)
		Zheng, Jiwu.....	1548 (I02, Wed)	Zünd, Tanja.....	510 (A05, Sun)
		Zheng, Menglian.....	442 (A03, Wed), 505 (A04, Thu)	Zurins, Aivars.....	1531 (I02, Tue)
		Zheng, Ming.....	691 (B02, Thu), 693 (B03, Mon), 705 (B03, Mon), 721 (B03, Tue)	Zurutuza, Amaia.....	834 (B06, Tue)
		Zheng, Mingsen.....	271 (A02, Tue), 1459 (I01, Wed)	Zyskin, Maxim.....	46 (A01, Mon)
		Zheng, Peng.....	2091 (M03, Wed)		
		Zheng, Tianye.....	253 (A02, Tue)		
		Zheng, Xueli.....	1466 (I01, Thu)		
		Zheng, Yiwei.....	1823 (I06, Wed)		
		Zheng, Yu.....	696 (B03, Mon), 715 (B03, Tue)		

ECS Institutional Members

The Electrochemical Society values the support of its institutional members. These organizations help ECS support scientific education, sustainability, and innovation. Through ongoing partnerships, ECS will continue to lead as the advocate, guardian, and facilitator of electrochemical and solid state science and technology.

Benefactor

AMETEK-Scientific Instruments (38)
Bio-Logic USA/Bio-Logic SAS (11)
Duracell (62)
Gamry Instruments (12)

Gelest, Inc. (10)
Hydro-Québec (12)
Pine Research Instrumentation (13)

(Number in parentheses indicates years of membership)

Patron

3M (30)
Energizer (74)
Faraday Technology, Inc. (13)
Lawrence Berkeley National Laboratory (15)

Panasonic Corporation, AIS Company (25)
Scribner Associates, Inc. (23)
Toyota Research Institute of North America (11)

Sponsoring

BASi (4)
Central Electrochemical Research Institute (26)
DLR-Institut für Vernetzte Energiesysteme e.V. (11)
EL-CELL GmbH (5)
Ford Motor Corporation (5)
GS Yuasa International Ltd. (39)
Honda R&D Co., Ltd. (12)
Medtronic Inc. (39)
Nissan Motor Co., Ltd. (12)

Permascand AB (16)
Technic Inc. (23)
Teledyne Energy Systems, Inc. (20)
The Electrosynthesis Company, Inc. (23)
Tianjin Lishen Battery Joint-Stock Co., Ltd. (5)
Toyota Central R&D Labs., Inc. (39)
Yeager Center for Electrochemical Sciences (21)
ZSW (15)

Sustaining

Axiall Corporation (24)
General Motors Holdings LLC (67)
Giner, Inc./GES (33)
IBM Corporation Research Center (62)
Ion Power Inc. (5)
Kanto Chemical Co., Inc. (7)
Karlsruher Institut für Technologie (3)

Leclanche SA (34)
Los Alamos National Laboratory (11)
Microsoft Corporation (2)
Occidental Chemical Corporation (77)
Sandia National Laboratories (43)
SanDisk (5)
Targray (3)

Please help us continue the vital work of ECS by joining as an institutional member today.
Contact Shannon.Reed@electrochem.org for more information.

FUTURE ECS MEETINGS



ECEE 2019:
Bioelectrochemistry and Energy Storage
GLASGOW, SCOTLAND
July 21-26, 2019
Scottish Event Campus



Early registration deadline: June 7, 2019



236th ECS Meeting
ATLANTA, GA
October 13-17, 2019
Hilton Atlanta

2019

Registration opens in June 2019



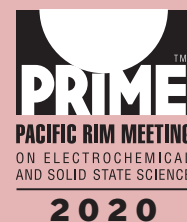
237th ECS Meeting
*with the 18th International Meeting
on Chemical Sensors (IMCS 2020)*
MONTRÉAL, CANADA
May 10-15, 2020
Palais des congress de Montréal



Abstract submission opens in July 2019



PRiME 2020
HONOLULU, HI
October 4-9, 2020
*Hawaii Convention Center &
Hilton Hawaiian Village*



Call for Papers published in November 2019



www.electrochem.org/meetings