Inaugural ECEE a Success

The first Electrochemical Conference on Energy & the Environment, ECEE 2014, was held in Shanghai, China, March 13-16, 2014. The international scientific conference and joint meeting of The Electrochemical Society (ECS) and the Chinese Society of Electrochemistry (CSE) covered a unique blend of topics pertaining to energy and the environment. ECEE 2014 served as a major forum for the discussion of interdisciplinary research from around the world through a variety of formats, such as invited and keynote oral presentations, poster sessions, and exhibits.

More than 500 scientists, the majority of whom were from Asia, explored 4 main symposia topics:

- Electrochemical Energy Storage
- Electrochemical Energy Conversion
- Electrochemical Fundamentals
- Environmental Electrochemistry

Guangmin Zhou *(second from left), the recipient of a Student Poster Award, is joined by (left to right)* **Shelley Minteer**, **Yongyao Xia**, **Shigang Sun**, **Tetsuya Osaka**, *and* **Paul Kohl**.

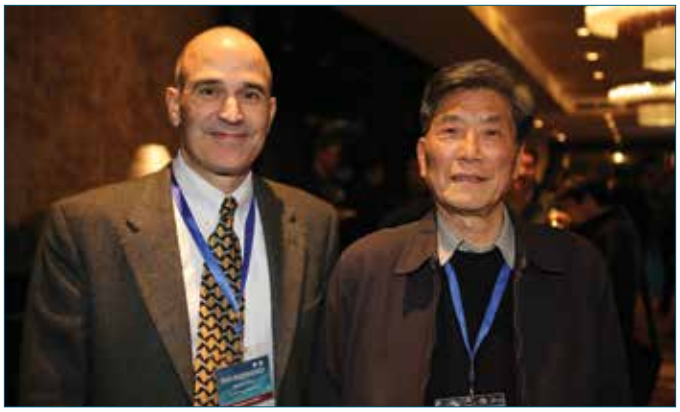
There were two plenary speakers. Yongfang Li, Professor of Chemistry at CAS Key Laboratory of Organic Solids, Institute of Chemistry, Chinese Academy of Sciences, speaking on "Photovoltaic Materials and Devices for Polymer Solar Cells." Polymer Solar Cells (PSC) have attracted great attention in recent years because of their advantages of low cost fabrication, light weight and possibility to be fabricated into flexible devices. Dr. Li presented his current research focus, increasing the power conversion efficiency of PSC. He talked about the requirements of the high efficiency donor/acceptor and electrode buffer layer materials, and reported on recent research progress on two dimensional conjugated polymers donor materials, fullerene bisadduct acceptor materials and solution-processable electrode buffer layers.

Yet-Min Chiang, the Kyocera Professor in the Department of Materials Science and Engineering at Massachusetts Institute of Technology, presented "Benefits and Barriers to Large Scale Energy Storage." Prof. Chiang highlighted his work developing a new type of flow battery based on high energy density particle suspension electrodes for ultralow-cost large scale energy storage.

More than 20 other keynote speakers added great depth to the scientific material presented in Shanghai. Full biographies as well as links to the detailed conference program and abstracts are posted online at www.electrochem.org/meetings/satellite/ecee/.

The student poster award winners were Morten Stornes, Norwegian University of Science and Technology; Tongwen Yu, Dalian Institute of Chemical Physics, Chinese Academy of Sciences; Guangmin Zhou, Institute of Metal Research, Chinese Academy of Sciences.

Students also had the opportunity to "meet the faculty" at an informal reception. More than a dozen academic leaders participated, including: Enrique Traversa, King Abdullah University of Science and



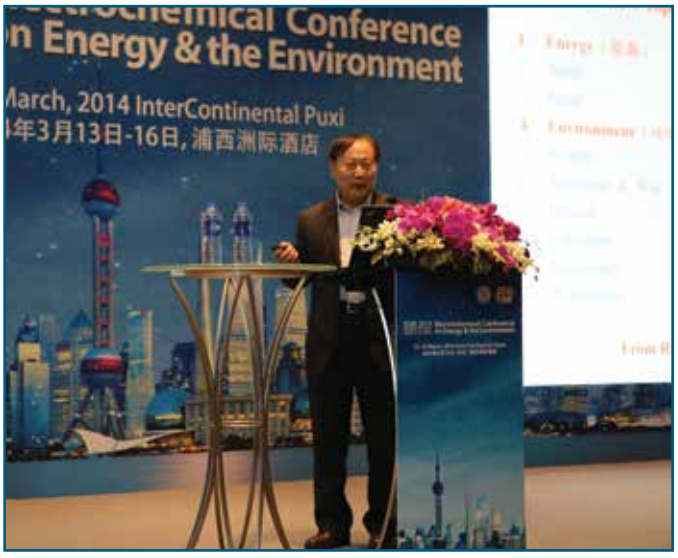
ECS Executive Director **Roque Calvo** *(left) and* **Zongrang Zhang** *(right), Shanghai Normal University.*

Shanghai at night.

Technology; Paul Kohl, Georgia Institute of Technology; Masayoshi Watanabe, Yokohama National University; Plamen B. Atanassov, University of New Mexico; Sanjeev Mukerjee, Northeastern University; Adam Weber, Lawrence Berkeley National Laboratory; Vijay Ramani, Illinois Institute of Technology; Bin Ren, Xiamen University; Pei Kang Shen, Sun Yat-sen University; Zong-Rang Zhang, Shanghai Normal University; Shelley Minteer, University of Utah; and Scott Calabrese Barton, Michigan State University.

ECS and CSE thank all the presenters, exhibitors and volunteers for their support in making ECCE 2014 a success.

The plenary speaker **Yet-Min Chiang**.



Yongfang Li *delivers his plenary talk.*

(continued on next page)

ECEE 2014

Local Committee

Yongyao Xia, *Fudan University*

Wenbin Cai, *Fudan University*

Zongrang Zhang, *Shanghai Normal University*

Zifeng Ma, *Shanghai Jiaotong University*

Symposia Committees

E1 - Electrochemical Energy Storage

Jun Chen (Lead), *Nankai University*

Yet-Ming Chiang, *MIT*

Yuguo Guo, *Institute of Chemistry, Chinese Academy of Sciences*

Tetsuya Osaka, *Waseda University*

Masayoshi Watanabe, *Yokohama National University*

Yongyao Xia, *Fudan University*

E2 - Electrochemical Energy Conversion

Zifeng Ma (Lead), *Shanghai Jiaotong University*

Raghu Bhattacharya, *National Renewable Energy Laboratory*

Deryn Chu, *Army Research Lab*

Peikang Shen, *Sun Yat-sen University*

Wei Xing, *Changchun Institute of Applied Chemistry*

E3 - Electrochemical Fundamentals

Shelley Minteer (Lead), *University of Utah*

Wenbin Cai, *Fudan University*

Bin Ren, *Xiamen University*

Enrico Traversa, *King Abdullah University of Science and Technology*

Kohei Uosaki, *Hokkaido University*

Lin Zhuang, *Wuhan University*

E4 - Environmental Electrochemistry

Giovanni Zangari (Lead), *University of Virginia*

Jinghong Li, *Tsinghua University*

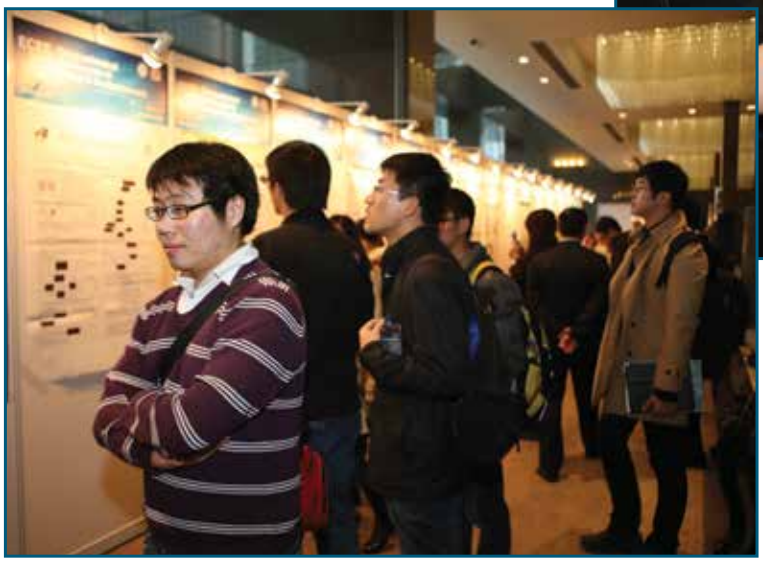
Haibo Lin, *Jilin University*

Zongrang Zhang, *Shanghai Normal University*

Electrochemical Conference on Energy & the Environment

Scenes from the meeting

(continued from previous page)



PRiME Adds Third Joint Meeting Partner in 2016

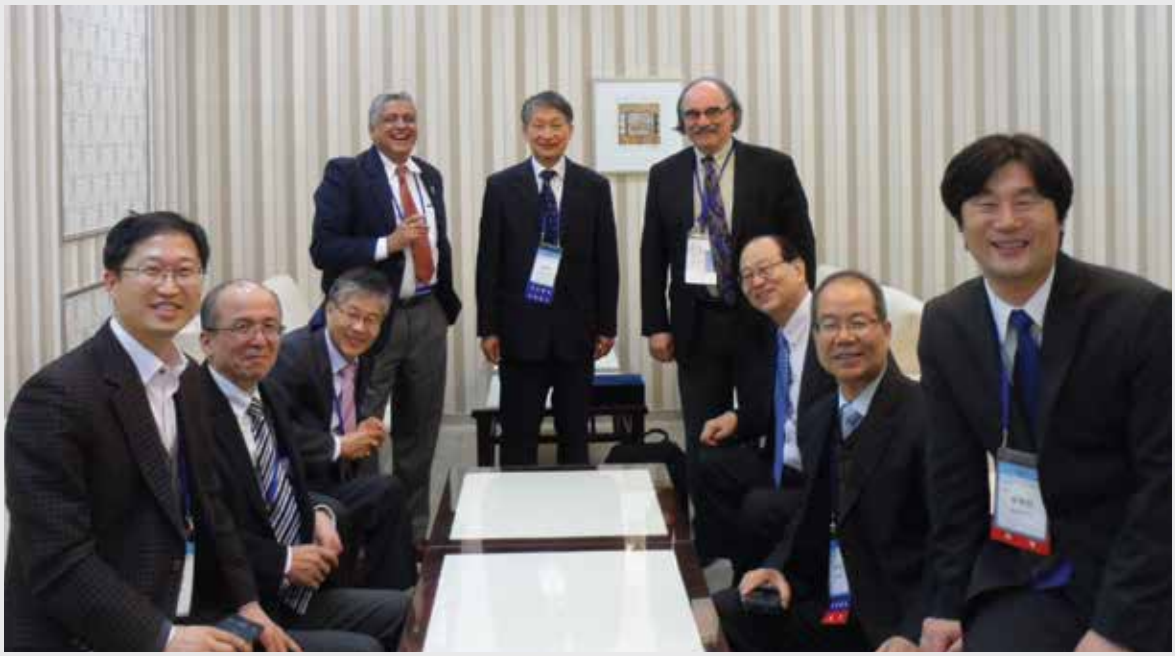
PACIFIC RIM MEETING ON ELECTROCHEMICAL AND SOLID-STATE SCIENCE

The Korean Electrochemical Society (KECS) will be joining The Electrochemical Society (ECS) and the Electrochemical Society of Japan (ECSJ) as the third joint meeting partner for the 2016 Pacific Rim Meeting on Electrochemical and Solid State Science (PRiME 2016). The meeting will be held in Honolulu, HI, at the Hawaii Convention Center from October 9-14, 2016, and will also be sponsored by the Japan Society of Applied Physics, the Chinese Electrochemical Society and the Electrochemistry Division of the Royal Australian Chemistry Institute.

PRiME 2016 will be the 7th in the series of Pacific Rim meetings which began in October 1987 with the first joint meeting between ECS and ECSJ. Sponsoring organizations have been added over the years and KECS has sponsored the last three PRiME Meetings. Adding KECS as a third joint partner was stimulated by their growing contributions to PRiME and their commitment to use PRiME as the host location for their normally scheduled fall meeting. As representatives of the PRiME Organizing Committee, ECS Executive Director Roque Calvo and Vice President Krishnan Rajeshwar met with the KECS leadership in March to confirm arrangements for the partnership. Dr. Rajeshwar noted that, "KECS members have made significant contributions to the technical program at the past several PRiME meetings. Adding them as a third partner was a natural evolutionary step which I believe will be very beneficial for the growth and quality of the meeting. On behalf of ECSJ and ECS we are thrilled to welcome KECS into the partnership of this great event."

The PRiME series of joint meetings has experienced tremendous success since the first one was held 27 years ago. With the presentation of 4010 technical papers, PRiME 2012 was the largest meeting ever held on electrochemical and solid state science and technology. It is a model of success for international scientific meetings and a model that advances our organizational missions through collaboration and partnership with other societies. The new partnership arrangement with KECS should add to that success and make PRiME 2016 a great event.

ECS Officers Attend Memorial Symposium in Honor of Su-Moon



Officers of The Electrochemical Society (ECS) and The Korean Electrochemical Society (KECS) attended the Memorial Symposium in Honor of Su-Moon held in Korea on November 7, 2013. Those present at the meeting were (left to right): **Jae-Joon Lee** *(General Secretary for 2014-2015, KECS, Konkuk Univ., Korea);* **Tomokazu Matsue** *(President-elect, ECSJ, Tohoku Univ., Japan);* **Kee Suk Nahm** *(President for 2014-2015, KECS, Chonbuk Univ., Korea);* **Krishnan Rajeshwar** *(3rd Vice President, ECS, President for 2016, Univ. of Texas at Arlington, USA);* **Hasuck Kim** *(President, ISE, DGIST, Korea);* **Daniel A. Scherson** *(2nd Vice President, ECS, President for 2015, Case Western Reserve Univ., USA);* **Tetsuya Osaka** *(President, ECS, Waseda Univ., Japan);* **Chi-Woo Lee** *(President for 2012-2013, KECS, Korea Univ., Korea);* **Won-Sub Yoon** *(General Secretary for 2012-2013, KECS, Sungkyunkwan Univ., Korea).*

ECS Establishes Deal & Grove Young Author Award

BRUCE E. DEAL

ANDY GROVE

ECS is pleased to announce it has established the Bruce Deal & Andy Grove Young Author Award. The award will be given for the best paper published in the *ECS Journal of Solid State Science and Technology* (JSS) by a young author or co-authors for the volume year preceding the award.

Since 1929, ECS has identified top young scientists who publish in our journals and annually recognize them for their contributions to electrochemical and solid state science and technology. The Young Authors Award is the Society's oldest award and the list of winners includes some of the most outstanding scientists and engineers of the past century. With the growth of the semiconductor technology industry in the 1960s, ECS began to give two Young Authors Awards for: 1) Electrochemical Science and Technology, and 2) Solid State Science and Technology. The were both named after long-time ECS Editor Norman Hackerman whose primary contributions were in electrochemical science. With the expansion of our publications to include a dedicated journal for solid state science and technology (JSS), the ECS Board decided to name the second Young Authors Award after significant contributors to solid state science and technology.

In 1967, Andy Grove and Bruce Deal were co-authors on a paper published in the *Journal of The Electrochemical Society* describing the Deal-Grove model, and the published work has had a lasting influence on the semiconductor technology industry. [See B. E. Deal, M. Sklar, A. S. Grove, and E. H. Snow, "Characteristics of the Surface-State Charge (Q_{SS}) of Thermally Oxidized Silicon," JES, **114**, 266 (1967). The paper is available for free online.] This paper has also had a lasting influence in the ECS Digital Library and is considered by the ECS Editorial Boards to be a seminal paper published in the area of solid state science and technology. ECS is pleased to honor the legacy and contributions of Bruce Deal and Andy Grove to the science by naming this award after them.

The award will consist of a scroll and a prize of $1,500 to be divided among the eligible authors of the winning paper. In addition, a $1,000 travel grant to be shared among the eligible authors will be given so that the winners may attend the ECS meeting where the award will be presented.

To be eligible for the award, the author or co-authors of the paper shall be under 31 years of age at the time the paper is initially submitted. Authors are given an opportunity to provide their birthdates in the journals' ECSxPress submission system.

National Science Foundation Funds Establishment of a Center for Electrochemical Process and Technology

Russ College of Engineering and Technology of Ohio University (Athens, OH) has received an NSF award of $112,275 to establish an Industry & University Cooperative Research Center (I/UCRC) in the category of *Energy and Environment*. A partner site will be at Washington University (St. Louis, MO). The new research center, the Center for Electrochemical Process and Technology (CEProTECH) acting as a consortium, will be dedicated to electrochemical alternatives of conventional chemical processes, with the main goal to enhance advanced production capabilities. The research agenda will be based on both classical electrochemical processes, such as chlor-alkali and aluminum, batteries and fuel cell manufacture, as well as novel (in electrochemistry) initiatives such as water remediation, advanced synthesis of specialty gasses, chemicals, materials such as graphene, commodities such as fertilizers or patient services, such as hemodialysis, among others. The Ohio team will focus on experimental techniques, while Washington University will focus on modeling, the two bringing together primarily fundamental, crosscutting projects with applicability to improve energy efficiency, production efficacy, manufacturing capacity and resource availability.

Companies with principal involvement in chemical, energy, oil and gas, aeronautical and other industries will join CEProTECH in order to benefit from increases in energy efficiency and manufacturing capacity; decreases in operational costs, emissions and water consumption; and other improvements. They will have access to a dedicated 20,000-square foot facility equipped with $7,000,000 modern equipment and supporting infrastructure. The center will be led by the Center for Electrochemical Engineering Director, and an ECS member, Gerardine Botte.

As per the NSF press release (March 2014), CEProTECH will expand the already strong list of educational activities by providing interdisciplinary education and training in the field of electrochemical engineering, through specialized workshops, international conferences, industry oriented seminars and conferences, web-based seminars, long-distance education and workforce development for manufacturing electrochemical devices. The Center will encourage a broad dissemination of learning through its continuing education activities to assist engineers in industry, as well as engineering students, in acquiring knowledge of electrochemical processes and systems to better prepare them for careers and career advancements in the industry.

Division News

Nanocarbons Division Student Participation

The Nanocarbons Division has a well-established tradition to encourage participation of students and young researchers at the ECS biannual meetings. At the 225th ECS meeting in Orlando, eleven students were awarded travel grants to present their work at the poster sessions and symposia organized or co-organized by the Division.

For the past few years, a generous sponsorship from Materials Technology Research company's CEO Michael Markovich (MTR Ltd., based in Ohio) helped establish awards for the best student poster and oral presentations. The 225th ECS meeting winners included Peeter Valk, MS student from Institute of Chemistry, University of Tartu, Estonia. His poster entitled, "Influence of Molybdenum Carbide Additive on the Oxygen Reduction Reaction Kinetics at Molybdenum Carbide Derived Carbon Electrode" was recognized as Best Nanocarbons Division's Student Poster. Two awards were given for the outstanding oral presentations: Eric V Bukovsky, PhD student from Colorado State University, presented a talk entitled "Structure Analysis of $C_{60}(CF_3)_{10}$ Isomers," at the M2 Symposium; and Karlee P Castro, a PhD student from Colorado State University, who presented her work at the M6 Symposium entitled, "Photophysics and Photochemistry of Trifluoromethylfullerene Fluorophores."

The Nanocarbons Division student award winners with the Division chair: (left to right) **Peeter Valk**, *Student Poster Award winner;* **Bruce Weisman**, *Nanocarbons Division Chair;* **Karlee P. Castro**, *outstanding student oral presentation winner; and,* **Eric V. Bukovsky**, *outstanding student oral presentation winner.*

Institutional Member News

Spotlight on Ametek

In late 2013, ECS overhauled its institutional membership program. We implemented a new benefits structure, emphasizing new discounts on advertising and meetings, and adding waivers for open access article processing charges. We're also working to improve visibility for those that support ECS with annual institutional memberships, as you can see from the list on page 132. As part of our institutional membership overhaul, we also created a new top level for institutional membership – the Visionary level.

Now, ECS is proud to announce our first visionary member, **Ametek**. This global manufacturer has two subsidiaries with which our readers may be more familiar, Princeton Applied Research and Solartron Analytical.

Princeton Applied Research is a leading manufacturer of laboratory instruments utilized for investigations in the field of electrochemistry, which includes batteries, fuel cells, corrosion, sensors and general physical chemistry. In business more than 50 years, Princeton Applied Research offer customers the benefit of knowledge, expertise, products, and solutions to support their particular research interest.

Solartron Analytical is the global leader in Electrochemical Impedance Spectroscopy, providing more than 60 years of instrumentation development expertise for materials and electrochemical research. Solartron Analytical instruments and accessories are advancing the research into the physical and electrochemical properties of batteries, fuel cells, organic coatings, corrosion inhibitors, and sensors, as well as the characterization of materials for dielectrics, solar cells, display technologies, ferroelectrics, and composites.

Nick Hall, Director of Global Sales and Marketing at Ametek, summarized their continued commitment, "We find great value in our partnership with ECS, which provides us with appropriate avenues to reach our customers through multiple media types including print, online and conferences. Through these avenues we are able to provide electrochemistry education, technical support to our customers as well as inform the market of our latest product offerings."

"ECS appreciates the active leadership role Ametek has taken within our society. Their equipment enables many of the important research studies currently being conducted in electrochemistry and solid state science and technology. We value their contributions to the field, and we are grateful for their continued support," said Dan Fatton, ECS Director of Development.

NREL's Energy Executives Leadership Training

Overview & Purpose

In April 2014, Dan Fatton, ECS Director of Development, attended the National Renewable Energy Laboratories (NREL) Energy Executives (Energy Execs) training at NREL's campus in Golden, Colorado. NREL is one of the U.S. Department of Energy's 17 national laboratories. Energy Execs is a program for non-technical decision-makers throughout the country to learn about renewable energy and energy efficiency technologies, analytical and research tools, and finance options. The lessons on renewable energy technology and promising practices will support ECS's efforts to "green" the Howe Commons complex, owned by ECS, in Pennington, NJ.

> **NREL's Mission**
>
> *NREL develops renewable energy and energy efficiency technologies and practices, advances related science and engineering, and transfers knowledge and innovations to address the nation's energy and environmental goals.*

The training structure facilitated experiential and classroom learning through three key activities: 1) in-depth policy and technology presentations by leading NREL researchers; 2) field trips to observe renewable energy projects and research demonstration sites; and, 3) small group project activities and networking. Although NREL hosts a broad range of research and development of renewable technology innovation, the Energy Execs program focused on the following technologies:

- Building technology (energy efficiency; simple and low-impact design principles; and more);
- Photovoltaic and solar technology (modules and materials, CSPs, case studies, and more);
- Alternative transportation (electric vehicle, biofuel, and conventional automotive technologies, and more);
- Wind (turbine testing, policy, economic analysis, and more); and
- Bioenergy (biomass conversion, characterization; cellulase enzymes and Microalgal biofuels; and more).

Expert researchers from multiple disciplines provided hour-long learning sessions about NREL's core roles as well as the policy, environmental, and economic implications of renewable energy implementation and integration. Highlights from these sessions included discussions on climate change & resiliency, a Renewable Electricity Future Study Overview and a presentation on government incentives and financial structures.

Field trips included:

- NREL's net-zero and energy efficiency building tour
- Energy Systems Integration Facility, HPC High Performance Computer Data Center, and Visualization Lab
- National Bioenergy Center
- National Center for Photovoltaics
- National Wind Technology Center

Participants in the Energy Execs program include leaders from government, communities, non-profits and the private sectors. The 2014 institute included local, regional, state, and federal government leaders; state public utility commission staff; a developer from a large real estate firm; experts in battery technology development; a Navy pilot; economic development professionals; a state energy officer; community energy team leaders; and more. In small groups on the final training day participants developed project ideas and presented action plans for implementing solutions to several renewable energy challenges: workforce development, policy, and technology concerns. An online portal, *Greenpoint*, will allow Energy Execs participants to stay connected and share news and ideas with over 200 alumni nationwide.

Lessons Learned

The training emphasized several important themes for communities and regions to consider when planning for renewable energy use and production. The need for grid integration and overall stronger grid infrastructure was one of the most prominent themes echoed throughout the three-day training. As evidenced by NREL's research and partnerships in the field, technology is not a barrier to larger-scale renewable energy implementation. However, the nation's aging infrastructure and fragmented utility systems, as well as policy and regulatory concerns, present barriers to system integration and further deployment of renewable energy. Renewable energy requires a more flexible grid, and solutions to the complicated demands for moving energy from production to consumers. Despite these challenges, NREL and other institutions' research indicate feasibility and need for diversifying energy production and applications – provided that there is stable federal policy; cooperative regional/utility network agreements; continued private and public sector collaboration; and sustained innovation in all aspects of energy project implementation.

Another key takeaway from the training is the importance of continued technological deployment. Developments in battery, energy storage and grid technology will be key to further renewable energy integration.

Next Steps

ECS will be implementing some of the energy efficiency best practices that were highlighted in the Energy Execs program on its property, Howe Commons, as part of its efforts to create a showcase for electrochemical and solid state science and technology. If you would like more information about Energy Execs, or to get involved with the Howe Commons greening initiative, please contact Dan Fatton at +1.609.737.1902 ext. 115.

ECS Staff News

Christie Knef joined ECS in September 2013. Christie attended The College of St. Elizabeth in Madison, NJ, for biology in 2004 and Middlesex County College in Edison, NJ, for business in 2007. Christie has spent several years volunteering and fundraising with the American Cancer Society and co-organizing charitable walks with the American Diabetes Association.

Christie started with ECS as the Development Manager. During this time she was responsible for managing and coordinating fundraising activities to support ECS's priorities and mission, managing and developing relationships with supporters, as well as the sales and coordination of the digital and print advertising programs. Additionally, she spent a great deal of time managing the ECS meeting symposia funding program, working closely with volunteers and funding agents to facilitate funding decisions and ensuring accurate reporting for annual meetings. In July, Christie transitioned to the Meetings and Exhibits Department as the Meetings and Exhibits Manager. Christie will be responsible for managing the development, organization and planning of ECS biannual meetings, satellite conferences, and other ECS sponsored events. Christie will work closely with other senior staff and volunteer leaders to ensure the meetings deliverables support the Society's goals and objectives.

Prior to joining ECS, Christie worked at the National Conference Center in East Windsor, NJ, as the Director of Corporate Sales. During her time at the National Conference Center she focused on new client development and conference center operations while consistently exceeding revenue and sales budgets. Additionally, she spearheaded the implementation and distribution of new corporate packages and marketing materials to ensure the conference center remained competitive.

Previously, Christie was the Social and Corporate Events Manager at Nicholas in Red Bank, NJ. Nicholas is recognized as New Jersey's Number one Zagat-rated restaurant since 2005, as well as one of Gayot's Top 40 Restaurants in the U.S. During her time at Nicholas, she organized and managed the annual Two River Theater's Anniversary charity gala, was responsible for all aspects of social and corporate events including maximizing event revenues and event operations management. Christie values her time at Nicholas as she feels it was truly where she realized her passion for detail and honed her ability to easily manage complex issues creatively and effectively while keeping the consumer's best interest in mind.

ECS Partners with the Metro New York Section Chapter of AIChE for "Batteries Today" Event

On Tuesday, February 11, 2014 ECS partnered with the Metro New York Section Chapter of the American Institute of Chemical Engineers (AIChE) for a joint event on **Batteries Today – A Discussion on Technological Advancements, Including Lithium-Ion Battery Applications**. The dinner meeting and panel discussion was held at the Pfizer Building in Manhattan, and moderated by Roland Stefandl, Founder, Director and Managing Partner of Poly-Chem Sytems. The featured speakers were Subhas Chalasani of Deka Battery and Amy C. Marschilok, Professor in the Chemistry Department at Stony Brook University.

Attendees enjoyed brief presentations from each speaker, highlighting the latest research and issues in the battery field. Dr. Chalasani spoke on the challenges for large-scale Lithium-Ion batteries. He noted that "while Lithium-Ion has no alternative for most of the rechargeable portable energy needs today, the technology has major safety hurdles to overcome in the large-scale applications including electric mobility and utility backup." Dr. Chalasani emphasized that safety containment and handling adds significant cost. He said "safety is an important aspect not just during manufacturing and operation of the batteries but also during recycling of the used batteries. The latter is over looked in the cost considerations." He further noted, "advanced lead acid batteries however, are enjoying the preferred technology status in micro hybrid applications today and Ultrabattery is proved to match the Nickel Metal hydride performance in mild hybrid applications."

Amy C. Marschilok, as part of her discussion commented "this is an important time for scientific and technological investigations in energy storage. Material control and systems level studies are potential keys to major breakthroughs. Energy storage research will lead to energy storage solutions only when application specific needs are carefully considered."

A lively question and answer period followed, and participants engaged in an interesting conversation about the future of batteries.

Subhas Chalasani *(left)*, Amy C. Marschilok *(center) and* Roland Stefandl *(right) at the AIChE meeting.*

In the NEXT *issue of* INTERFACE

- **Electrochemical Manufacturing** will be featured in the fall 2014 issue. Guest edited by Dennie T. Mah, the featured articles include (tentative list): "Electrochemical Deburring and Polishing," by E. J. Taylor; "Impendance-Based Characterization in Electrochemical Manufacturing," by Douglas Riemer and Mark Orazem; and "A Technical Overview of Electrochemical Manufacturing Processes," by Gerri Botte.
- **Special Section on the Fall 2014 Meeting in Cancun** …The fall issue will contain a special section on the upcoming ECS meeting in Cancun, Mexico.
- **Tech Highlights** continues to provide readers with free access to some of the most interesting papers published in the ECS journals, including articles from the Society's newest journals: *ECS Journal of Solid State Science and Technology*, *ECS Electrochemistry Letters*, and *ECS Solid State Letters*.
- Don't miss the next edition of **Websites of Note** which gives readers a look at some little-known, but very useful sites.

2014-2015 ECS Committees

Executive Committee of the Board of Directors

Paul Kohl, Chair ..... Spring 2015
Daniel Scherson ..... *Senior Vice-President*, Spring 2015
Krishnan Rajeshwar ..... *Second Vice-President*, Spring 2016
Johna Leddy ..... *Third Vice-President*, Spring 2017
Hariklia Deligianni ..... *Secretary*, Spring 2016
E. Jennings Taylor ..... *Treasurer*, Spring 2018
Roque J. Calvo ..... *Term as Executive Director*

Board of Directors, Presidential Appointment

Stuart Swirson ..... Spring 2015

Audit Committee

Tetsuya Osaka, Chair ..... *Immediate Past President*, Spring 2015
Daniel Scherson ..... *Senior Vice President*, Spring 2016
Paul Kohl ..... *President*, Spring 2015
E. Jennings Taylor ..... *Treasurer*, Spring 2018
Stuart Swirson ..... *Nonprofit Financial Professional*, Spring 2015

Education Committee

Mark Orazem, Chair ..... Spring 2017
Randy Leising ..... Spring 2015
Chris Apblett ..... Spring 2015
Kalpathy Sundaram ..... Spring 2016
Jeffry Kelber ..... Spring 2016
Douglas Hansen ..... Spring 2017
A. Robert Hillman ..... Spring 2017
James (Jamie) Noel ..... Spring 2018
Vimal Chaitanya ..... Spring 2018
Johna Leddy ..... *Third Vice-President*, Spring 2015
Kevin Rhodes ..... *Chair, Individual Membership Committee*, Spring 2017

Ethical Standards Committee

Tetsuya Osaka, Chair ..... *Immediate Past President*, Spring 2015
Fernando Garzon ..... *Past Officer*, Spring 2015
William Brown ..... *Past Officer*, Spring 2016
Jan Talbot ..... *Past Officer*, Spring 2017
Hariklia Deligianni ..... *Secretary*, Spring 2016

Finance Committee

E. Jennings Taylor, Chair ..... *Treasurer*, Spring 2018
Pete Peterson ..... Spring 2015
Plamen Atanassov ..... Spring 2015
Jean St-Pierre ..... Spring 2016
William Eggers ..... Spring 2016
Daniel Scherson ..... *Senior Vice-President*, Spring 2015
Hariklia Deligianni ..... *Secretary*, Spring 2016

Honors and Awards Committee

Peter Pintauro, Chair ..... Spring 2015
Kalpathy Sundaram ..... Spring 2015
Paul Natishan ..... Spring 2015
Joseph Stetter ..... Spring 2015
Jean St. Pierre ..... Spring 2016
Durga Misra ..... Spring 2016
Fan Ren ..... Spring 2016
Enrico Traversa ..... Spring 2017
Pawel Kulesza ..... Spring 2017
Vijay Ramani ..... Spring 2017
Marca Doeff ..... Spring 2018
Takayuki Homma ..... Spring 2018
Francis D'Souza ..... Spring 2018
Paul Kohl ..... *President*, Spring 2015

Individual Membership Committee

Kevin Rhodes, Chair ..... Spring 2017
David (Picheng) Huang ..... Spring 2015
Parag Banerjee ..... Spring 2015
Elizabeth Podlaha-Murphy ..... Spring 2016
Wataru Sugimoto ..... Spring 2016
Thomas Schmidt ..... Spring 2017
William Mustain ..... Spring 2017
Hariklia Deligianni ..... *Secretary*, Spring 2016

Nominating Committee

Tetsuya Osaka, Chair ..... *Immediate Past President*, Spring 2015
Paul Natishan ..... Spring 2015
Charles Hussey ..... Spring 2015
Robert Savinell ..... Spring 2015
Johna Leddy ..... *Third Vice-President*, Spring 2015

Sponsorship Committee

Christina Bock, Chair ..... Spring 2016
William Eggers ..... Spring 2015
William Brown ..... Spring 2015
Paul Trulove ..... Spring 2015
Bruno Scrosati ..... Spring 2016
Yukinari Kotani ..... Spring 2016
Soo-Gil Park ..... Spring 2016
Hubert Gasteiger ..... Spring 2017
Fred Roozeboom ..... Spring 2017
Prasanth Kumar Nammalwar ..... Spring 2017
Paul Kohl ..... *President*, Spring 2015
E. Jennings Taylor ..... *Treasurer*, Spring 2018
Roque J. Calvo ..... *Term as Executive Director*

Technical Affairs Committee

Daniel Scherson, Chair ..... *Senior Vice President*, Spring 2015
Paul Kohl ..... *President*, Spring 2015
Tetsuya Osaka ..... *Immediate Past President*, Spring 2015
Fernando Garzon ..... *2nd Immediate Past President*, Spring 2015
Johna Leddy ..... *Chair, Symposium Planning Advisory Board* Spring 2015
Krishnan Rajeshwar ..... *Chair, Publications Subcommittee*, Spring 2015
Eric Wachsman ..... *Chair, Interdisciplinary Science & Technology Subcommittee*, Spring 2016

Tellers of Election

Craig Arnold, Chair ..... Spring 2015
James Amick ..... Spring 2015
Norman Goldsmith ..... Spring 2015
Robert Comizzoli, *Alternate* ..... Spring 2015
Ronald Enstrom, *Alternate* ..... Spring 2015
William Ayers, *Alternate* ..... Spring 2015

Ways and Means Committee

Hariklia Deligianni, Chair ..... *Secretary*, Spring 2016
Peter Fedkiw ..... Spring 2015
Adam Weber ..... Spring 2015
James Fenton ..... Spring 2016
Elizabeth Podlaha-Murphy ..... Spring 2016
Daniel Scherson ..... *Second Vice-President*, Spring 2015
Krishnan Rajeshwar ..... *Senior Vice-President*, Spring 2015

Fuel Cell Subcommittee of the Technical Affairs Committee

Hubert Gasteiger, Chair ..... Spring 2015
Trung Nguyen ..... Spring 2015
Thomas Fuller ..... Spring 2015
Eric Wachsman ..... Spring 2015
Prashant Kamat ..... Spring 2015
Thomas Zawodzinski ..... Spring 2015
James Fenton ..... Spring 2015
Claude Lamy ..... Spring 2015
Adam Weber ..... Spring 2015
Ernesto Gonzalez ..... Spring 2015

Interdisciplinary Science and Technology Subcommittee of the Technical Affairs Committee

Eric Wachsman, Chair ..... Spring 2016
Ana Londergan ..... Spring 2015
Trung-Van Nguyen ..... Spring 2015
Michael Carter ..... Spring 2015
Shelley Minteer ..... Spring 2015
Arumugam Manthiram ..... Spring 2016
Patrik Schmuki ..... Spring 2016
John Stickney ..... Spring 2016
Phaedon Avouris ..... Spring 2016
James Burgess ..... Spring 2017
Madis Raukas ..... Spring 2017
Colm O'Dwyer ..... Spring 2017
Sri Narayan ..... Spring 2017

(continued on next page)

2014-2015 ECS Committees
(continued from previous page)

Meetings Subcommittee of the Technical Affairs Committee

Johna Leddy, Chair ..... *Third Vice-President*, Spring 2015
Cristina Bock, Vice Chair ..... Spring 2015
D. Noel Buckley ..... Spring 2015
Bor Yann Liaw ..... Spring 2016
Adam Weber ..... Spring 2016
Roque Calvo ..... *Term as Executive Director*

Publications Subcommittee of the Technical Affairs Committee

Krishnan Rajeshwar, Chair ..... *Second Vice-President*, Spring 2015
Mary E. Yess ..... *Publisher, Term as Publisher*
Robert F. Savinell ..... *EST Board Chair*, 5/31/2017
Dennis W. Hess ..... *SSST Board Chair*, 12/31/2016
Petr Vanýsek ..... *Interface Co-Editor*, 5/31/2017
Vijay Ramani ..... *Interface Co-Editor*, 5/31/2017
Jeffrey Fergus ..... *ECS Transactions Editor*, 12/31/2014
Hubert Gasteiger ..... Spring 2015
James Fenton ..... Spring 2015
John Flake ..... Spring 2016
Csaba Janaky ..... Spring 2016
Hariklia Deligianni ..... *Secretary*, Spring 2016

Symposium Planning Advisory Board of the Technical Affairs Committee

Johna Leddy, Chair ..... *Third Vice-President*, Spring 2015
Bor Yann Liaw ..... *Chair, Battery Division*, Fall 2014
Shinji Fujimoto ..... *Chair, Corrosion Division*, Fall 2014
Dolf Landheer ..... *Chair, Dielectric Science and Technology Division*, Spring 2016
Giovanni Zangari ..... *Chair, Electrodeposition Division*, Fall 2015
Andrew Hoff ..... *Chair, Electronics and Photonics Division*, Spring 2015
Adam Weber ..... *Chair, Energy Technology Division*, Spring 2015
Bruce Weisman ..... *Chair, Nanocarbons Division*, Spring 2016
Jeffrey Fergus ..... *Chair, High Temperature Materials Division*, Fall 2015
Venkat Subramanian ..... *Chair, Industrial Electrochemistry and Electrochemical Engineering Division*, Spring 2016
Anant Setlur ..... *Chair, Luminescence and Display Materials Division*, Fall 2015
James Burgess ..... *Chair, Organic and Biological Electrochemistry Division*, Spring 2015
Rob Mantz ..... *Chair, Physical and Analytical Electrochemistry Division*, Spring 2015
Michael Carter ..... *Chair, Sensor Division*, Fall 2014
Eric Wachsman ..... *Chair, Interdisciplinary Science & Technology Subcommittee*, Spring 2016

Committee on Free Dissemination of Research

Larry Faulkner, Chair ..... Spring 2015
Allen Bard ..... Spring 2015
William D. Brown ..... Spring 2015
Akira Fujishima ..... Spring 2015
Esther Takeuchi ..... Spring 2015
Isao Taniguchi ..... Spring 2015
Masayoshi Watanabe ..... Spring 2015
Martin Winter ..... Spring 2015
Mark Wrighton ..... Spring 2015
Paul Kohl ..... *President*, Spring 2015
Roque Calvo ..... *Executive Director* Spring 2015

Society Historian

Zoltan Nagy ..... Spring 2016

Representatives to Other Societies

American Association for the Advancement of Science
Roque J. Calvo ..... *Term as Executive Director*
Chemical Heritage Foundation
Kathryn R. Bullock ..... *Heritage Councilor*, Spring 2016
Federation of Materials Societies
Petr Vanýsek ..... *Trustee*, Spring 2016
External Relations Representative
Mark Orazem ..... Spring 2015

National Inventors Hall of Fame

Peter Pintauro ..... *Chair, Honors & Awards Committee*, Spring 2015

Paul A. Kohl
President

Johna Leddy
Vice-President

Results of the 2014 Election of Officers and Slate of Officers for 2015

The ECS Tellers of Election have announced the results of the 2014 election of Society officers, with the following persons elected: President — Paul Kohl, Georgia Institute of Technology; Vice-President — Johna Leddy, University of Iowa; and Treasurer — E.J. Taylor, Faraday Technology, Inc. The terms of Dan Scherson (Vice-President); Krishnan Rajeshwar (Vice-President) and Hariklia Deligianni (Secretary) were unaffected by this election.

At the Board of Directors meeting in Orlando, Florida, on May 15, 2014, members of the Board voted to approve the slate of candidates recommended by the ECS Nominating Committee. The slate of candidates for the next election of ECS officers, to be held in January-March 2015, include: for President — Daniel Scherson; and for Vice-President (one to be elected) Yue Kuo and Joseph Stetter. Full biographies and candidate statements will appear in the winter 2014 issue of *Interface*.

E. Jennings Taylor
Treasurer

ECS Division Contacts

Battery

Bor Yann Liaw, Chair
University of Hawaii at Manoa
bliaw@hawaii.edu • 808.956.2339 (U.S.)

Robert Kostecki, Vice-Chair
Christopher Johnson, Secretary
Marca Doeff, Treasurer

Corrosion

Shinji Fujimoto, Chair
Osaka University
fujimoto@mat.eng.osaka-u.ac.jp • 81.6.6879.7469 (Japan)

Rudolph Buchheit, Vice-Chair
Barbara A. Shaw, Secretary/Treasurer

Dielectric Science and Technology

Dolf Landheer, Chair
National Research Council - Canada
dolf.landheer@nrc-cnrc.gc.ca • 613.993.0560 (Canada)

Yaw Obeng, Vice-Chair
Vimal Desai Chaitanya, Secretary
Puroshothaman Srinivasan, Treasurer

Electrodeposition

Giovanni Zangari, Chair
University of Virginia
gz3e@virginia.edu • 434.243.5474 (U.S.)

Elizabeth Podlaha-Murphy, Vice-Chair
Stanko Brankovic, Secretary
Philippe Vereecken, Treasurer

Electronics and Photonics

Andrew Hoff, Chair
University of South Florida
hoff@usf.edu • 813.974.4958 (U.S.)

Mark Overberg, Vice-Chair
Edward Stokes, 2nd Vice-Chair
Junichi Murota, Secretary
Fan Ren, Treasurer

Energy Technology

Adam Weber, Chair
Lawrence Berkeley National Laboratory
azweber@lbl.gov • 1.510.486.6308 (U.S.)

Scott Calabrese Barton, Vice-Chair
Andrew Herring, Secretary
Vaidyanathan (Ravi) Subramanian, Treasurer

High Temperature Materials

Xiao-Dong Zhou, Chair
University of South Carolina
zhox@cec.sc.edu • 1.803.777.7540 (U.S.)

Turgut Gur, Sr. Vice-Chair
Gregory Jackson, Jr. Vice-Chair
Paul Gannon, Secretary/Treasurer

Industrial Electrochemistry and Electrochemical Engineering

Venkat Subramanian, Chair
Washington University in St. Louis
vsubramanian@seas.wustl.edu • 314.935.5676(U.S.)

Douglass Reimer, Vice-Chair
John Staser, Secretary/Treasurer

Luminescence and Display Materials

Anant A. Setlur, Chair
GE Global Research Center
setlur@ge.com • 1.518.387.6305 (U.S.)

Madis Raukas, Vice-Chair
Mikhail Brik, Secretary/Treasurer

Nanocarbons

R. Bruce Weisman, Chair
Rice University
weisman@rice.edu • 713.348.3709 (U.S.)

Slava V. Rotkin, Vice-Chair
Hiroshi Imahori, Secretary
Dirk Guldi, Treasurer

Organic and Biological Electrochemistry

James Burgess, Chair
Case Western Reserve University
jdb22@po.cwru.edu • 216.368.4490 (U.S.)

Mekki Bayachou, Vice-Chair
Graham Cheek, Secretary/Treasurer

Physical and Analytical Electrochemistry

Robert Mantz, Chair
Army Research Office
robert.a.mantz@us.army.mil • 919.549.4309 (U.S.)

Pawel Kulesza, Vice-Chair
Andrew Hillier, Secretary
Alanah Fitch, Treasurer

Sensor

Michael Carter
KWJ Engineering
mcarter58@earthlink.net • 510.405.5911 (U.S.)

Bryan Chin, Vice-Chair
Nianqiang (Nick) Wu, Secretary
Ajit Khosla, Treasurer

New Division Officers

New officers for the 2014-2016 terms have been elected for the following Divisions.

Dielectric Science & Technology Division

Chair
Dolf Landheer, National Research Council – Canada
Vice-Chair
Yaw Obeng, NIST
Secretary
Vimal Desai Chaitanya, New Mexico State University
Treasurer
Purushothaman Srinivasan, Global Foundries
Awards/ Travel Grant Chair
Peter Mascher, McMaster University, Canada
Symposium Chair
Mahendra Sunkara, University of Louisville
Membership Chair
Uros Cvelbar, Jozef Stefan Institute, Slovenia (IJS)
Members-at-Large
Sacharia Albin, Norfolk State University
Gautam Banerjee, Air Products and Chemicals, Inc.
William Brown, University of Arkansas
Daniel Bauza, IMEP
Zhi Chen, University of Electronic Science and Technology of China
Toyohiro Chikyow, National Institute for Materials Science
Stefan De Gendt, IMEC
John Flake, Louisiana State University
Reenu Garg, International Rectifier
Dennis Hess, Georgia Institute of Tecnology
Michel Houssa, University of Leuven
Hiroshi Iwai, Tokyo Institute of Technology
Rashmi Jha, University of Toledo
P. C. Joshi, Oak Ridge National Laboratory
Samares Kar, Indian Institute of Technology
Zia Karim, AIXTRON
Paul Kohl, Georgia Institute of Tecnology
Ana Londergan, Qualcomm Technologies
G. Swami Mathad, S/C Tech Consulting USA
Robert Mertens, University of Central Florida
Durgamadhab Misra, New Jersey Institute of Technology
Hazara S. Rathore, Retired from IBM
R. Ekwal Sah, Fraunhofer-Institut
Sudipta Seal, University of Central Florida
Krishna Shenai, Argonne National Laboratory
Kalpathy B. Sundaram, University of Central Florida
John Susko
Robin Susko
Ravi M. Todi, Qualcomm, Inc.

Nanocarbons Division

Chair
R. Bruce Weisman, Rice University
Vice-Chair
Slava V. Rotkin, Lehigh University
Secretary
Hiroshi Imahori, Kyoto University
Treasurer
Dirk Guldi, University of Erlangen-Nurnberg
Members-at-Large
Jeff Blackburn, NREL
Olga Boltalina, Colorado State University
Francis D'Souza, University of North Texas
Tatiana DaRos, University of Trieste
Shunichi Fukuzumi, Osaka University
Karl M. Kadish, University of Houston
Prashant Kamat, University of Notre Dame
Richard Martel, University of Montreal
Nazario Martin, Universidad Complutense de Madrid
Roberto Paolesse, University of Rome Tor Vergata
Maurizio Prato, University of Trieste
Tomas Torres, Universidad Autonoma de Madrid
Lon Wilson, Rice University
Ming Zheng, NIST

Industrial Electrochemistry & Electrochemical Engineering Division

Chair
Venkat Subramanian, Washington University in St. Louis
Vice-Chair
Douglas P. Riemer, Hutchinson Technology
Secretary/Treasurer
John Staser, Ohio University
Members-at-Large
James Fenton, University of Central Florida
Trung Van Nguyen, University of Kansas
Mark E. Orazem, University of Florida
Robert Savinell, Case Western Reserve University
John Weidner, University of South Carolina
E. Jennings Taylor, Faraday Technologies, Inc.

websites of note

by Zoltan Nagy

Physical and Interfacial Electrochemistry
Ion-solvent interactions. Ion-ion interactions. Electrochemical thermodynamics. Electrode-solution interface. Electrode kinetics. Material transport. Hydrodynamic electrodes. (Lecture notes)

- M. Lyons, Trinity College
- http://chemistry.tcd.ie/undergraduate/chemistry/js/CH3304/index.php

Surface Electrochemistry and Reactivity
The surface of the metal substrate. Platinum single crystals. Charge displacement and anion adsorption. Adatom adsorption. Foreign adatom layers. Potential of zero total charge.

- J. M. Feliu and E. Herrero, Universitat d'Alacant
- http://publicacions.iec.cat/repository/pdf/00000168%5C00000016.pdf

Analytical Electrochemistry: A Laboratory Manual
Cyclic voltammetry at solid electrodes. Cyclic voltammetry with a microelectrode. Chronoamperometry with a planar solid electrode. Cyclic voltammetry of dopamine: an *ec* mechanism. Analysis of trace lead in water by anodic stripping voltammetry. Acetaminophen (Tylenol): electroanalytical study of acetaminophen by cyclic voltammetry. Ascorbic acid (vitamin C): a cyclic voltammetric study of its oxidation at a glassy carbon electrode.

- T. Kuwana, University of Kansas
- http://www.asdlib.org/onlineArticles/elabware/kuwanaEC_lab/ec_labmanual1.htm

Analytical Electrochemistry: The Basic Concepts
Electrochemistry is something that is seldom studied and yet is all around us, including the control circuitry of our body. We are familiar with lightning that reverberates with thunder in a rainstorm, with batteries that power flashlights and hybrid autos, and with sensor devices such as smoke and carbon dioxide detectors, or glucose analyzers for monitoring diabetes. All rely on or exhibit some basic electrochemistry. To understand electrochemical phenomenon we need to have some understanding of basic concepts and the language that conveys these concepts. It is the goal of this module to get you started – so you can explore further as you wish. Web-links and hardcopy references are provided to assist you in that process.

- R. S. Kelly, East Stroudsburg University
- http://www.asdlib.org/onlineArticles/ecourseware/Kelly_Potentiometry/EC_CONCEPTS1.HTM

ElectroChemical DataBase: Gibbs energies of transfer
This searchable collection lists the Gibbs energies of transfer for ions partitioning between water and a mutually immiscible solvent. The solvents listed are 1,2-dichloroethane, 1,6-dichlorohexane, 2-heptanone, 2-octanone, NPOE-nitrophenyloctylether, trifluorotoluene, acetophenone, nitrobenzene and o-dichlorobenzene.

- H. H. Girault, École polytechnique fédérale de Lausanne
- http://sbsrv7.epfl.ch/instituts/isic/lepa/cgi/DB/InterrDB.pl

About the Author

Zoltan Nagy is a semi-retired electrochemist. After 15 years in a variety of electrochemical industrial research, he spent 30 years at Argonne National Laboratory carrying out research on electrode kinetics and surface electrochemistry. Presently he is at the Chemistry Department of the University of North Carolina at Chapel Hill. He welcomes suggestions for entries; send them to nagyz@email.unc.edu

ECS Sponsored Meetings for 2014

In addition to the regular ECS biannual meetings and ECS Satellite Conferences, ECS, its Divisions, and Sections sponsor meetings and symposia of interest to the technical audience ECS serves. The following is a list of the sponsored meetings for 2014. Please visit the ECS website for a list of all sponsored meetings.

- **10th International Symposium on Electrochemical Micro & Nanosystem Technologies**, November 5-8, 2014 — Okinawa, Japan
- **Fifth International Conference on Electrophoretic Deposition: Fundamentals and Applications (EPD-2014)**, October 5-10, 2014 — Hernstein, Austria
- **XIV International Congress of the Mexican Hydrogen Society ,** September 30-October 4, 2014 — Cancun, Mexico
- **65th Annual Meeting of the International Society of Electrochemistry,** August 31-September 5, 2014 — Lausanne, Switzerland
- **15th International Conference on Advanced Batteries, Accumulators and Fuel Cells (ABAF 15),** August 24-28, 2014 — Brno University of Technology
- **ACS Symposium on Fuel Cell Chemistry and Operation,** August 10-14, 2014 — San Francisco, CA
- **Shechtman International Symposium on Sustainable Mining, Minerals, Metal and Materials Processing,** June 28-July 4, 2014 — Cancun, Mexico

To learn more about what an ECS sponsorship could do for your meeting, including information on publishing proceeding volumes for sponsored meetings, or to request an ECS sponsorship of your technical event, please contact ecs@electrochem.org.

See the Society's
Annual Report
starting on page 89 in this isue.
2013