

# Call for Papers



Hilton San Francisco, San Francisco, CA  
May 24-29, 2009

## Abstracts are due no later than December 15, 2008.

**NOTE:** Some abstracts are due earlier than December 15, 2008. Please carefully check the symposium listing for any alternate abstract submission deadlines. For complete details on abstract submission and symposium topics, please see [www.electrochem.org](http://www.electrochem.org).

## Abstract Submission and Deadlines

Submit one original meeting abstract electronically via [www.electrochem.org](http://www.electrochem.org), no later than **December 15, 2008**. Faxed abstracts, late abstracts, and abstracts more than one page in length will not be accepted. In February 2009, all presenting authors will receive an email from the ECS headquarters office notifying them of the date and time of their presentation. Only authors with a non-U.S. address will receive a hardcopy acceptance letter. Other hardcopy letters will be sent only upon request.

Meeting abstracts should explicitly state objectives, new results, and conclusions or significance of the work. Abstracts **must** be properly formatted and no more than **one page in length**. Please use the preformatted template located at: [http://www.electrochem.org/meetings/guidelines/inst\\_a.htm](http://www.electrochem.org/meetings/guidelines/inst_a.htm). Programming for this meeting will occur in January and February of 2009, with some papers scheduled for poster presentation. Check the ECS website for further program details.

## Paper Presentation

All authors selected for either oral or poster presentations will be notified in February of 2009. Oral presentations must be in English. Only LCD projectors will be provided for oral presentations. **Presenting authors will be required to bring their own laptops to the meeting.** We strongly suggest that presenting authors verify laptop/projector compatibility in the speaker ready room prior to their presentation at the meeting. Speakers requiring additional equipment must make written request to the ECS headquarters office at least one month prior to the meeting and appropriate arrangements will be worked out, subject to availability, and at the expense of the author. Poster presentations should be displayed in English, on a board approximately 4 feet high by 8 feet wide (1.22 meters high by 2.45 meters wide), corresponding to the abstract number and day of presentation in the final program.

## Manuscript Publication

**Meeting Abstracts** — All meeting abstracts will be published both on the ECS website and in the *Meeting Abstracts* CD-ROM copyrighted by ECS, and become the property of ECS upon presentation.

**ECS Transactions** — All full papers presented at ECS meetings are eligible for submission to the online publication, *ECS Transactions* (ECST). Each meeting is represented by a "volume" of ECST, and each symposium is represented by an "issue."

Some symposia will publish their issues to be available for sale "AT" the meeting; some of these issues will also be available in a hard-cover edition. Please see each individual symposium listing in this Call to determine if there will be an "AT" meeting issue. In this case, submission to ECST is mandatory, and required in advance of the meeting.

Some symposia will publish their issues to be available "AFTER" the meeting. Even if an individual symposium listing does not specify publication of an ECST issue, all authors are still encouraged to submit their full papers. To determine acceptance in ECST, all submitted manuscripts will be reviewed, either by the symposium organizers or by the ECST Editorial Board. After the meeting, all accepted papers in ECST will be available for sale, either individually, or by issue.

Papers presented at the meeting, and papers submitted to ECST, may also be submitted to the Society's technical journals: the *Journal of The Electrochemical Society* or *Electrochemical and Solid-State Letters*. Full manuscripts must be submitted within six months of the symposium date. "Instructions to Authors" are available from the ECS headquarters office, the journals, or the ECS website.

Please visit the ECST website (<http://ecsd1.org/ECST/>) for additional information, including overall guidelines, deadlines for submissions and reviews, author and editor instructions, a manuscript template, and much more.

**If publication is desired elsewhere after presentation, written permission from ECS is required.**

## Financial Assistance

Financial assistance is very limited and generally governed by the symposium organizers. Individuals may inquire directly to the symposium organizers of the symposium in which they are presenting their paper to see if funding is available. Individuals requiring an official letter of invitation should write to the ECS headquarters office; such letters will not imply any financial responsibility of ECS. Students seeking financial assistance should consider awarded travel grants (see page 100 of this issue of *Interface*). Young Faculty travel grants are also available (see page 101).

## Hotel Reservations

The 215<sup>th</sup> Meeting will be held at the Hilton San Francisco, located at 333 O'Farrell Street, San Francisco, CA 94102. Special rates have been reserved at the Hilton San Francisco for participants attending this meeting. The reservation deadline is **April 24, 2009**. Please refer to ECS website for rates and reservations.

## Meeting Registration

All participants, including authors and invited speakers of the 215<sup>th</sup> Meeting, are required to pay the appropriate registration fees. Hotel and meeting registration materials will be distributed in February of 2009 and will also be available on the ECS website ([www.electrochem.org](http://www.electrochem.org)). The deadline for advance registration is **April 24, 2009**.

## Short Courses

A number of short courses will be offered on Sunday, May 24, 2009, from 9:00 AM-4:30 PM. Short Courses require advance registration and may be cancelled if enrollments are too low. The Short Courses topics as of press-time are: Advanced Impedance Spectroscopy, Solid State Lighting, Fullerenes and Carbon Nanotubes, and Atomic Layer Deposition. Please check the ECS website for the final list of offerings.

## Technical Exhibit

The 215<sup>th</sup> ECS Meeting will also include a Technical Exhibit, featuring presentations and displays by over 30 manufacturers of instruments, materials, systems, publications, and software of interest to meeting attendees. Full exhibit booths manned by company representatives cost \$1,800 and include one free meeting registration. Literature display tables (unmanned by company representatives; no meeting registration included) will also be available for \$850. Parties interested in exhibiting should contact Amir Zaman at the ECS headquarters office for more information. Coffee breaks are scheduled each day in the exhibit hall along with evening poster sessions to increase traffic.

## Sponsorship Opportunities

ECS biannual meetings are wonderful chances to market your company through sponsorship. Sponsors will be recognized by level in *Interface*, the Meeting Program, the Exhibit Guide, on registrant bags, and on the ECS website.

The Levels are: Platinum: \$5,000+, Gold: \$2,500+, Silver: \$1,000+, and Bronze: \$1,000.

In addition, sponsorships are available for the plenary talks and other special events. These opportunities include the recognition stated above along with additional personalized packages. Special event sponsorships will be assigned by the Society on a first-come, first served basis. For more information, contact Amir Zaman at ECS headquarters.

## Contact Information

If you have any questions or require additional information, contact ECS, 65 South Main Street, Pennington, New Jersey, 08534-2839, USA, tel: 609.737.1902, fax: 609.737.2743, e-mail: [ecs@electrochem.org](mailto:ecs@electrochem.org); Web: [www.electrochem.org](http://www.electrochem.org).

# SYMPOSIUM TOPICS

## **A** General Topics

- A1 — General Student Poster Session
- A2 — Nanotechnology General Session

## **B** Batteries, Fuel Cells, and Energy Conversion

- B1 — Battery / Energy Technology Joint General Session
- B2 — Battery Modeling at Cell Level
- B3 — Characterization of Porous Materials 2
- B4 — Fuel Cells for Portable Power
- B5 — Hydrogen Production, Transport, and Storage 3
- B6 — Measurement and Diagnostics for Energy Systems
- B7 — Nanostructured Materials for Energy Storage and Conversion
- B8 — Photoelectrochemical Energy Conversion
- B9 — Advanced Materials and Concepts for Energy Harvesting

## **C** Biomedical Applications and Organic Electrochemistry

- C1 — Organic and Biological Electrochemistry General Poster Session
- C2 — Dielectrics and Engineered Interfaces in Biological and Biomedical Applications
- C3 — Mechanistic and Synthetic Aspects of Organic Electrochemistry

## **D** Corrosion, Passivation, and Anodic Films

- D1 — Corrosion General Session

## **E** Dielectric and Semiconductor Materials, Devices, and Processing

- E1 — Advanced Gate Stack, Source/Drain, and Channel Engineering for Si-Based CMOS 5: New Materials, Processes, and Equipment
- E2 — Chemical Mechanical Polishing 10
- E3 — Nanocrystal Embedded Dielectrics for Electronic and Photonic Devices
- E4 — Novel Plasma Techniques for Low Temperature Processing of Thin Films for Flexible Electronics
- E5 — Silicon Nitride, Silicon Dioxide, and Alternate Emerging Dielectrics 10
- E6 — Solid-State Lighting
- E7 — State-of-the-Art Program on Compound Semiconductors 50 (SOTAPOCS 50)
- E8 — Processes at the Semiconductor Solution Interface 3
- E9 — SOI Device Technology 14

## **F** Electrochemical / Chemical Deposition and Etching

- F1 — Electrochemical Processing in ULSI and MEMS 4

## **G** Electrochemical Synthesis and Engineering

- G1 — Industrial Electrochemistry and Electrochemical Engineering General Session
- G2 — Leadership and Entrepreneurship in Electrochemical Engineering: A Tutorial Symposium
- G3 — Separators and Membranes for Batteries, Capacitors, Fuel Cells, and Other Electrochemical Systems
- G4 — Multiscale Modeling of Electrochemical Systems 3
- G5 — Tutorials in Electrochemical Technology — Current Distribution

## **H** Fullerenes, Nanotubes, and Carbon Nanostructures

- H1 — Electron Transfer and Applications of Fullerenes and Nanostructured Materials
- H2 — Molecular and Supramolecular Chemistry of Fullerenes and Carbon Nanotubes
- H3 — Carbon Nanotubes and Nanostructures: Fundamental Properties and Processes
- H4 — Carbon Nanotubes and Nanostructures: Applications and Devices
- H5 — Endofullerenes and Carbon Nanocapsules
- H6 — Energetics and Structure and Solid-State Physics
- H7 — Carbon Nanotubes and Nanostructures: Medicine and Biology
- H8 — Porphyrins and Supramolecular Assemblies
- H9 — Metallic and Semiconducting Nanoparticles for Energy Conversion
- H10 — First International Symposium on Graphene and Emerging Materials for Post-CMOS Applications

## **I** Physical and Analytical Electrochemistry

- I1 — Physical and Analytical Electrochemistry General Session
- I2 — Electrochemical Detection of Pathogens
- I3 — Electrochemistry in Medicine and Biomedical Applications
- I4 — Impedance in Electrochemistry: From Analytical Applications to Mechanistic Speculation 2
- I5 — Nanostructured Materials: Chemistry and High Temperature Applications
- I6 — Novel Electrode Materials
- I7 — Role of Electrochemistry in Addressing Climate Change

## **J** Dielectric and Semiconductor Materials, Devices, and Processing

- J1 — Sensors, Actuators, and Microsystems General Session
- J2 — Thirty-Five Years of Chemical Sensors: A Symposium in Honor of Professor Jiri Janata
- J3 — Sensor Applications: Food Safety, Agricultural, and Environmental Sensors

# 215<sup>th</sup> ECS Meeting — San Francisco, CA

## Call for Papers

### A — General Topics

#### A1 General Student Poster Session All Divisions

This poster session provides a forum for graduate and undergraduate students to present research results of general interest to ECS. The purpose of this session is to foster and promote work in both electrochemical and solid-state science and technology, and to stimulate active student interest and participation in ECS. A competition for the two best posters will be part of the session. A cash prize of \$250 and a scroll will be awarded to the winning student authors. In the case of coauthors, a maximum award of \$750 per winning poster will be divided equally between student coauthors. The awards will be made without regard to gender, citizenship, race, or financial need.

**An issue of *ECS Transactions* is planned to be published "AFTER" the meeting. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 22, 2009. All manuscripts will be submitted online, and must be in either MS Word or PDF format.**

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **V. Desai**, New Mexico State University, e-mail: vimalc@nmsu.edu; **G. Botte**, Ohio University, e-mail: botte@ohio.edu; **P. Kulesza**, University of Warsaw, e-mail: pkulesza@chem.uw.edu.pl; **V. Subramanian**, Tennessee Tech University, e-mail: vsubramanian@tntech.edu; and **X. Zhang**, North Carolina State University, e-mail: xiangwu\_zhang@ncsu.edu.

#### A2 Nanotechnology General Session All Divisions

The emergence of nanotechnology as a major field of research has touched almost every scientific discipline. The number of applications for materials that are prepared on a nanometer scale is expanding rapidly. The advancement of these applications is made possible by the new methods of preparation and characterization of materials and composites on a nanometer scale. Examples include catalysts for fuel cell applications, semiconductors for photovoltaic and photoelectrochemical solar energy conversion, and chemical and biological sensors.

This symposium will focus on critical issues and state-of-the-art developments in the science and technology of nanostructured materials and devices for electrochemistry applications. Papers are solicited in all areas related to materials including metals, ceramics, semiconductors, organic compounds and polymers, and to devices including molecular/nano electronics, chemical and biological sensors, and actuators.

Areas of interest include: semiconductor and metal nanoparticles and metal/semiconductor nanocomposites; size quantization effects in semiconductor nanoparticles; fundamentals of nucleation and growth of nanoparticles; novel synthesis methods of nanostructured materials; processing of nanostructured materials; advanced characterization techniques for nanostructured materials; modelling and tailoring of nanostructured materials; nanocomposites and interfacial phenomena; photoinduced charge separation

and interfacial charge transfer; photoelectrochemistry of nanostructured films; photocatalysis and environmental applications; nano-ionics; nanostructured catalysts for fuel cells; nanostructured sensor surfaces; and biological applications of nanomaterials.

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Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **E. Traversa**, University of Rome Tor Vergata, e-mail: traversa@uniroma2.it; and **C. Bock**, National Research Council of Canada, Institute for Chemical Processes and Environmental Technologies, e-mail: Christina.Bock@nrc-cnrc.gc.ca.

### B — Batteries, Fuel Cells, and Energy Conversion

#### B1 Battery / Energy Technology Joint General Session Battery / Energy Technology

Original papers are solicited on all types of batteries. Of particular interest are recent developments of advanced battery materials, novel battery designs, emerging battery technology, and optimization and breakthroughs in performance. Reviews of the state-of-the-art battery performance for specific applications, including consumer devices, hybrid or electric vehicles, and distributed energy systems, may also be submitted.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **N. J. Dudney**, Oak Ridge National Laboratory, e-mail: dudneynj@ornl.gov; **S. R. Narayanan**, Jet Propulsion Laboratory, e-mail: s.r.narayanan@jpl.nasa.gov; and **C. R. Walk**, BAE Systems Applied Technologies, e-mail: dick.walk@gmail.com.

#### B2 Battery Modeling at Cell Level Battery / Energy Technology / Industrial Electrochemistry and Electrochemical Engineering

Computer simulations of battery behavior has served as a useful means of understanding performance limitations and in optimizing the design of cells for use in various applications. This symposium will aim to cover the breadth of the capabilities of mathematical models when applied to cell level studies. Specific topics of interest include: (1.) performance simulation; (2.) abuse simulation; (3.) Calendar and cycle life estimation; (4.) SOC monitoring and control; and (5.) models for physical property estimation. Models that describe the behavior of electrochemical capacitors (EDLC and Faradaic capacitors) are also encouraged. Methods based on a first principles approach as well as equivalent circuit and statistical approaches will be covered.

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**B3**

## **Characterization of Porous Materials 2**

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

This symposium provides a forum for recent advances in experimental techniques and mathematical models to characterize the properties of porous materials employed in a wide range of electrochemical applications. Porous materials are used in practical applications of electrocatalysis, batteries, supercapacitors, fuel cells, and other electrochemical technologies. The understanding of porous materials through characterization techniques and models is critical to improve the performance, durability, and reliability of these devices. Papers dealing with every aspect of the electrochemistry of porous electrode materials will be accepted, including theory of porous materials, description of the preparation procedure, property characterization and modeling techniques including (but limited to) electronic and ionic conductivity, porosity, reactivity, gas and liquid transport, surface energy and interaction between different phases and interfaces and also the distribution of the same within the porous material, studies of their electrochemical responses and applications. Furthermore, understanding the life cycle of porous materials from beginning of life properties till end of life properties and its impact on durability of electrochemical devices is essential for commercial viability of these electrochemical technologies. Contributions covering any of these aspects are welcomed.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **B. Lakshmanan**, General Motors, e-mail: balsu.lakshmanan@gm.com; **G. Brisard**, University of Sherbrooke, e-mail: Gessie.Brisard@USherbrooke.ca; and **A. Lasia**, University of Sherbrooke, e-mail: A.Lasia@USherbrooke.ca.

**B4**

## **Fuel Cells for Portable Power**

### **Energy Technology**

Fuel cells based on high energy fuels have the potential of meeting the long run-time requirements for portable power in consumer and military applications. Fuel cells operating on high energy fuels including, methanol, ethanol, borohydride, hydrogen and hydrocarbons are of particular interest for portable applications. The symposium will explore various aspects of research and engineering that include catalysis, cell design, membranes and electrolytes, system design, fabrication of components, and durability. Oral and poster presentations are invited.

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**B5**

## **Hydrogen Production, Transport, and Storage 3**

### **High Temperature Materials / Energy Technology / Physical and Analytical Electrochemistry / Industrial Electrochemistry and Electrochemical Engineering**

Hydrogen is the most abundant chemical-energy resource in the world, but unlike oil and natural gas it is an "energy carrier" not an "energy source." There are no H<sub>2</sub> "wells" available in the world. Further, we do not have a hydrogen infrastructure. The longest pipeline in the world is only 950 miles long. The largest plant operating today produces only 250 million standard cubic feet per day of H<sub>2</sub>. Therefore, the hydrogen infrastructure will have to be created and production will have to be increased an order of magnitude to meet DOE's 2015-18 projections.

The objective of this symposium is to bring together researchers working on developing the required hydrogen infrastructure. Papers are solicited in all areas of hydrogen production, transportation and storage. Specific topics include the conversion of fossil fuels and biomass to hydrogen, electrolysis, and thermo-chemical routes to hydrogen production; electrocatalysis, proton/hydrogen transport materials and processes; and hydrogen storage technology from adsorption media to metal hydrides.

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**B6****Measurement and Diagnostics for Energy Systems**

Energy Technology / Sensor / Physical and Analytical Electrochemistry

Over the years many *in situ* methods have been used in the performance and failure modes of power sources and energy conversion systems. These techniques include impedance spectroscopy, NMR, voltammetry, neutron imaging, X-ray spectroscopy, Mossbauer spectroscopy, and XRD. This symposium will feature work on the fundamentals of the techniques and applications of these techniques to research of various types of energy systems including fuel cells, batteries, photovoltaics, and photoelectrochemical systems. Oral and poster presentations are invited.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **S. R. Narayanan**, Jet Propulsion Laboratory, e-mail: s.r.narayanan@jpl.nasa.gov; **S. Mukerjee**, Northeastern University, e-mail: s.mukerjee@neu.edu; **R. Mukundan**, Los Alamos National Laboratory, e-mail: mukundan@lanl.gov; and **P. Strasser**, University of Houston, e-mail: pstrasser@uh.edu.

**B7****Nanostructured Materials for Energy Storage and Conversion**

Energy Technology / Battery

Nanostructured materials exhibit greatly altered interface, bulk, and surface properties compared to micron materials. Some of these properties include electrochemical catalysis, nanopainting, bulk and intergranular diffusion, electronic and ionic conductivity nano structured materials manipulation to produce desirable enhancement in performance of fuel cell, batteries, energy storage and active research.

This symposium will focus on nanostructured materials in the area of electrochemical, energy storage, and conversion. In the area of batteries and supercapacitors, intercalation anodes and cathodes, nanocomposites polymers, and metal hydrides. Topics of interest in the general area of fuel cells include catalysts of the electro-oxidation of hydrogen, reformed and organic fuels, catalysts for oxygen reduction, supported and unsupported materials, and polymer electrolytes for PEM.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **K. Zaghib**, Institute de Recherche d'Hydro-Québec (IREQ), e-mail: zaghib.karim@ireq.ca; **K. M. Abraham**, E-KEM Sciences, e-mail: kmabraham@comcast.net; and **C. Julien**, Université Pierre et Marie Curie, e-mail: cjul@ccr.jussieu.fr.

**B8****Photoelectrochemical Energy Conversion**

Energy Technology / Physical and Analytical Electrochemistry

This symposium will address all fundamental and applied aspects of inorganic and organic semiconductor-electrolyte interfaces (SEIs). Topics of interest include but are not limited to the following: (1.) charge transfer across SEIs in the dark and under irradiation; (2.) role of traps and surface states in mediating charge transfer; (3.) chemical modification and passivation of SEIs; (4.) semiconductor nanoparticle-electrolyte interfaces; (5.) semiconductor nanotubes, nanorods, and other configurations; (6.) mild and energy-efficient methods for preparing semiconductor films, nanoparticles, and other morphologies listed above; (7.) novel methods for characterizing SEIs; (8.) use of SEIs for photoassisted hydrogen generation; (9.) dye-sensitized solar cells; (10.) use of SEIs for storing solar energy; (11.) use of SEIs in third generation solar cells; and (12.) photocatalysis and environmental remediation aspects coupled with energy conversion or storage (e.g., hybrid dye destruction and hydrogen generation schemes).

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **K. Rajeshwar**, University of Texas at Arlington, e-mail: rajeshwar@uta.edu; **J. Hupp**, Northwestern University, e-mail: j-hupp@northwestern.edu; and **B. Parkinson**, Colorado State University, e-mail: baparkin@lamar.colostate.edu.

**B9****Advanced Materials and Concepts for Energy Harvesting**

High Temperature Materials / Energy Technology / New Technology Subcommittee

This symposium is aimed at providing a platform to discuss the latest materials research on energy harvesting systems based on fuel cells, thermoelectrics, piezoelectrics, supercapacitors, batteries, and hybrid systems. Special interest is on fundamental electrochemical and electromechanical phenomena involved in the energetic materials, including but not limited to, formation of charge carriers (e.g. electrons and ions), nonstoichiometry and defect chemistry, charge exchange, charge disproportionation, charge transport, electrochemically active catalysts, anomalous charge and mass transport in reduced dimensional systems, and modeling/simulation. In addition, general topics of interest are micro/nanostructures processing, crystallographic investigations, composition and stoichiometry optimization, physical and electrochemical properties, and performance of constituents for aforementioned systems, including: (1.) materials for the electrodes and electrolytes for fuel cells and their stability; (2.) novel n and p type oxides or composites for thermoelectric devices; (3.) inorganic materials for the electrodes and electrolytes of supercapacitors and batteries; and (4.) novel materials for high temperature piezoelectrics, especially lead-free compounds. The symposium will include both invited and contributed papers.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **X.-D. Zhou**, Pacific Northwest National Laboratory, e-mail: xiaodong.zhou@pnl.gov; **M. Manivannan**, National Energy Technology Laboratory, e-mail: manivana@netl.doe.gov; and **J. C. Nino**, University of Florida, e-mail: jnino@mse.ufl.edu.

## C—Biomedical Applications and Organic Electrochemistry

C1

### Organic and Biological Electrochemistry General Poster Session

Organic and Biological Electrochemistry

Submissions are solicited in all area of organic, organo-metallic, and biological electrochemistry. Areas of interest include synthetic and mechanistic electrochemistry as well as industrial and educational applications.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizer: **J. Burgess**, Case Western Reserve University, e-mail: jdb22@case.edu.

C2

### Dielectrics and Engineered Interfaces in Biological and Biomedical Applications

Dielectric Science & Technology / Electronics and Photonics / Sensor / Organic and Biological Electrochemistry

This symposium is intended to bring together scientists and technologists working at the forefront of chemistry, physics, biology, and materials science to focus on the critical aspects of the interfaces in biomedical devices and applications. It will provide invaluable links between those investigating and characterizing the basic chemical, physical, and biological phenomena and those developing the latest lab-on-a-chip systems, sensors, biochips, or other devices and technologies. The emphasis will be on novel work that involves the interface of organic sensing molecules with inorganic substrates as well as novel sensing mechanisms. In this regard topics include fractal design of electrodes for biosensors and biofuel cells, biomimetic biophotonic based sensor arrays, amplification-less DNA detection, and sample preparation methods implemented on microfluidic platforms. Reviews of the technological issues, the latest solutions for ISFET, and micro- and nanocantilever sensing approaches will be presented, and finally, the impact of quantum devices, plasmonics, nanomaterials, and metamaterials on the future of biosensing will be debated.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **M. Madou**, University of California-Irvine, mmadou@uci.edu; **S. Daunert**, University

of Kentucky-Lexington, daunert@uky.edu; **I-M. Hsing**, Hong Kong University of Science and Technology, China, kehasing@ust.hk; **C. Kranz**, Georgia Institute of Technology, christine.kranz@chemistry.gatech.edu; **D. Landheer**, National Research Council, Canada, dolf.landheer@nrc.ca; **L.A. Nagahara**, National Cancer Institute, nagaharl@mail.nih.gov; **M. Nishizawa**, Tohoku University, nishizawa@biomems.mech.tohoku.ac.jp; **A. Offenhaeusser**, ISG2 - Research Center Juelich, a.offenhaeusser@fz-juelich.de; **K. Sode**, Tokyo University of Agriculture and Technology, sode@cc.tuat.ac.jp; and **T. Thundat**, Oak Ridge National Lab, thundattg@ornl.gov.

Invited Speakers will include Andreas Bausch, Michel Bergeron, Sadik Esener, Horacio Kido, Scott Manalis, Micic Miodrag, Kohji Mitsubayashi, Stephen Pearton, Tony Ricco, Aldo Roda, Nongjian Tao, Mike Tierney, David Walt.

C3

### Mechanistic and Synthetic Aspects of Organic Electrochemistry

Organic and Biological Electrochemistry / Physical and Analytical Electrochemistry

This symposium is concerned with all aspects of organic and biological electrochemistry that deal with mechanisms and synthesis. Topic areas include (but are not restricted to) the following: (1.) new reactions promoted by direct and indirect electron transfer, and the specific role of the interface in these processes; (2.) new electrode materials, electrolytes, and solvents; (3.) anodic and cathodic polymerization; (4.) organometallic systems; (5.) electrochemistry in molten salts, ionic liquids, supercritical fluids, and aqueous disperse systems; (6.) asymmetric induction in electron-transfer systems; (7.) multi-mediated redox reactions; (8.) electroenzymatic syntheses; and (9.) chemically modified electrodes.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **D. Peters**, Indiana University, e-mail: peters@indiana.edu; and **G. Cheek**, U.S. Naval Academy, e-mail: cheek@usna.edu.

## D—Corrosion, Passivation, and Anodic Films

D1

### Corrosion General Session

Corrosion

Oral presentations concerning all aspects of corrosion and associated phenomena in liquid and gaseous phases are welcome. Theoretical analyses, experimental investigations, descriptions of new techniques for the study of corrosion, and analyses of corrosion products and films are of interest. Note that this session will consist of both oral and poster presentations.

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## **E— Dielectric and Semiconductor Materials, Devices, and Processing**

**E1**

### **Advanced Gate Stack, Source/Drain, and Channel Engineering for Si-Based CMOS 5: New Materials, Processes, and Equipment**

Electronics and Photonics / Dielectric Science & Technology / High Temperature Materials

This symposium will cover the latest developments in advanced processes and materials for CMOS front-end integration including gate stack, source/drain, and channel engineering. Researchers are encouraged to submit abstracts on novel processes, electrical/analytical characterization, and material/device modelling, as well as design and fabrication of new device structures for ultimate CMOS. Topics of particular interest include: (1.) high mobility channel materials (strained Si, SiGe, pure Ge and Si:C channels; GaAs, InGaAs, GaN, and other new III-V channel materials; integration of III-V channels on Si; and novel, low-temperature epitaxial processes); (2.) advanced gate stacks (high-k gate dielectrics on Si and new high mobility channel materials and metal gate electrodes); and (3.) ultra-shallow junctions (advanced doping and annealing technologies, dopant activation and diffusion in new channel materials, and self-aligned or selectively deposited contacts to ultra-shallow junctions).

Researchers are *also* encouraged to submit abstracts on new developments in advanced processing equipment for the materials and processes listed above. Technologies of interest include but are not limited to chemical vapor deposition (ALD, MOCVD, RTCVD, UHV-CVD and molecular beam epitaxy), rapid thermal, UV, plasma, or laser-assisted processes. Abstracts on new analytical and electrical characterization methods for the above materials as well as inspection equipment to improve throughput, uniformity, *in situ* monitoring, non-intrusive wafer inspection, and process are also of interest to this symposium.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **F. Roozeboom**, NXP Semiconductors, e-mail: Fred.Roozeboom@nxp.com; **E. P. Gusev**, Qualcomm MEMS Technologies, e-mail: gusev@qualcomm.com; **H. Iwai**, Tokyo Institute of Technology, e-mail: iwai@ae.titech.ac.jp; **D-L. Kwong**, Institute of Microelectronics, e-mail: kwongdl@ime.a-star.edu.sg; and **P. J. Timans**, Mattson Technology Inc., e-mail: Paul.Timans@mattson.com.

**E2**

## **Chemical Mechanical Polishing 10**

Dielectric Science & Technology

This symposium will address the fundamentals of chemical mechanical planarization (CMP) and its applications in interlayer dielectrics (ILD) polishing, metal polishing, and trench and mesa isolation. The symposium will also discuss post CMP cleaning, consumable characterization, polish end point detection, CMP process integration, and manufacturing issues, as well as other pertinent issues of this technology. Papers will be solicited in the following areas: (1.) CMP polishing science and technology; (2.) CMP process modeling; (3.) CMP process optimization and control; (4.) CMP consumables characterization; (5.) CMP process integration issues; (6.) surface and electrochemical aspects of CMP; (7.) surface and electrochemical aspects of post CMP cleaning; (8.) CMP related defect detection and characterization; (9.) electrical characterization of post CMP surfaces; (10.) aspects of nanotechnology; and (11.) environment aspects of CMP.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **G. Banerjee**, Air Products and Chemicals, Inc., e-mail: banerjg@airproducts.com; **V. Desai**, New Mexico State University, e-mail: vimalc@nmsu.edu; **Y. Obeng**, Nkanea Technologies Inc., e-mail: YSOA1@aol.com; and **K. Sundaram**, University of Central Florida, e-mail: sundaram@mail.ucf.edu.

**E3**

## **Nanocrystal Embedded Dielectrics for Electronic and Photonic Devices**

Dielectric Science & Technology / Electronics and Photonics

This symposium will address the science and technology of nanocrystals—both of elemental and compound semiconductors—embedded in dielectric films and structures, with emphasis on applications in electronics and photonics. Research fields of interest are related but not necessarily limited to the following topics: (1.) fabrication of nanocrystalline structures: deposition processes, implantation protocols, annealing strategies; (2.) characterization of nanocrystals: optical and electrical characteristics, photo- and electroluminescence, size distributions, crystalline structure; (3.) charge trapping characteristics of nano-particles in a dielectric medium; (4.) device issues: contacts to n- and p-type structures, light extraction, breakdown issues; (5.) doping for photonic applications: doping concentrations, energy transfer, co-doping, multi-layer structures; and (6.) integration of photonic devices with existing silicon-based electronic platforms. Invited and contributed papers will discuss both the fundamental aspects underlying certain applications and the particular challenges regarding technology, fabrication processes, and reliability.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **P. Mascher**, McMaster University, e-mail: mascher@mcmaster.ca; **P. Joshi**, Sharp



Laboratories of America, Inc., e-mail: pjoshi@sharplabs.com; **Y. Kuo**, Texas A&M University, e-mail: yuekuo@tamu.edu; **M. E. Overberg**, Sandia National Laboratories, meoverb@sandia.gov; and **V. Srinivasan**, Lawrence Berkeley National Laboratory, e-mail: vsrinivasan@lbl.gov.

**E4**

## Novel Plasma Techniques for Low Temperature Processing of Thin Films for Flexible Electronics

Dielectric Science & Technology

This symposium will focus on low temperature processing of novel thin films for potential applications in flexible electronics which include sensors, flexible displays, solar cells, smart cards, MEMS, and bio-applications. The plasma techniques have been extensively used in the processing of various semiconductor and dielectric thin films at processing temperatures higher than 250°C. The fabrication of high performance devices integrated on low temperatures flexible substrates requires the deposition of thin films at lower temperatures without sacrificing the performance. This symposium will focus on the following key aspects of low temperature integration of thin films on flexible substrates: (1.) novel plasma techniques for low temperature processing (plasma sources, innovative tools, and system design); (2.) low temperature processing of thin films (process development, thin film characterization, and temperature-process-property correlation); and (3.) plasma treatments to enhance the microstructure, composition, optical, and electrical properties of thin films deposited by suitable thin film techniques (effects of plasma generated ion/radicals on bulk and interface characteristics). Invited and contributed papers will discuss on both the opportunity and challenges of plasma based approaches for the low temperatures integration of thin films on flexible substrates.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **P. Joshi**, Sharp Laboratories of America, Inc., e-mail: pjoshi@sharplabs.com; **V. Srinivasan**, Lawrence Berkeley National Laboratory, e-mail: vsrinivasan@lbl.gov; and **R. Todi**, Semiconductor Research and Development Center, IBM Microelectronics, e-mail: rmtodi@us.ibm.com.

**E5**

## Silicon Nitride, Silicon Dioxide, and Alternate Emerging Dielectrics 10

Dielectric Science & Technology

This symposium is a continuation of the highly successful "International Symposium on Silicon Nitride, Silicon Dioxide Thin Insulating Films," which has taken place nine times in the past. The objective is to link material studies and technological applications. The symposium will include both invited and contributed papers.

Specific topics of interest on silicon dioxide, silicon nitride, and emerging dielectrics including organic, high-k and low-k layers are, but not limited to: (1.) growth and deposition (thermal CVD, PECVD, sputtering, ion implantation, thermal nitridation and oxidation, atomic layer deposition, MOCVD, PVD etc.); (2.) film characterization (IR spectroscopy, Photoluminescence, RBS, NRA, SIMS, AES, XPS, AFM, TEM, EPR, NMR, ellipsometry, novel characterization and analytical techniques); (3.) porosity, mechanical, electrical, chemical, physical, and optical properties; (4.) plasma and

non-plasma process-induced damage: mechanism, reduction, and recovery; (5) adhesion and substrate-film interactions; (6.) degradation: NBTI, PBTI, radiation, and hot-carriers; (7.) dielectric breakdown, failure, and reliability related to process integration; (8.) mathematical, physical, and computational modeling; (9.) strained layers and relaxed defect formation; (10.) defect and charge carriers: passivation, charge transport, trapping and de-trapping, characteristic of traps, and tunneling; (11.) films for semiconductors memories, especially for gigabit generations; (12.) insulating films for compound semiconductor devices (interlevel dielectric, topcoat, capacitor dielectric, surface passivation, interfaces, dielectrics dependent electrical and optical properties of devices); (13.) dielectrics used for photonic applications; (14.) multi-layer dielectric stacks; (15.) plasma science and plasma processing technology for thin films; (16.) isolation techniques including PBL, SEG, doped glasses; and (17.) plasma etching and CMP of dielectrics.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **R. Ekwah Sah**, Fraunhofer Institute for Applied Solid State Physics, e-mail: sah@iaf.fhg.de; **J. Zhang**, Liverpool John Moores University, e-mail: j.f.zhang@livjm.ac.uk; **J. Yota**, Skyworks Solutions, Inc., e-mail: jiro.yota@skyworksinc.com; **J. M. Deen**, McMaster University, e-mail: jamal@mcmaster.ca; and **A. Toriumi**, The University of Tokyo, e-mail: toriumi@material.t.u-tokyo.ac.jp.

**E6**

## Solid-State Lighting Electronics and Photonics

This symposium will provide a forum for the presentation and discussion of the latest developments in emerging solid-state lighting technology and related fields. Papers, which deal with all aspects of light emitting diode physics, fabrication, design, packaging, phosphors, and multichip lamps, are solicited. Topics to be addressed in this symposium are: (1.) physics and design of inorganic and organic LEDs; (2.) contact effects in LEDs; (3.) light extraction techniques; (4.) LED packaging; (5.) LED performance; (6.) high brightness LEDs; (7.) lighting phosphor technology; (8.) near and deep UV LEDs; (9.) organic LEDs (OLEDs); (10.) advanced LED concepts; (11.) light extraction; (12.) heat removal issues; (13.) phosphor conversion LEDs; (14.) white solid-state lamps; (15.) optimization of solid-state lighting sources; (16.) LED and lighting systems drivers; (17.) applications of solid-state lamps; (18.) systems and infrastructure issues; and (19.) emerging LED materials and concepts.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **M. Shur**, Rensselaer Polytechnic Institute, e-mail: shurm@rpi.edu; **I. Ferguson**, Georgia Institute of Technology, e-mail: ianf@ece.gatech.edu; and **A. Zukauskas**, Vilnius University, e-mail: arturas.zukauskas@ff.vu.lt.

## **E7** State-of-the-Art Program on Compound Semiconductors 50 (SOTAPOCS 50)

### Electronics and Photonics

In recognition of the 50<sup>th</sup> running of SOTAPOCS, a special program on compound semiconductors with invited talks on the history and high-profile developments over the past 25 years is planned. In addition, the symposium also solicits contributed papers on the most recent developments in compound semiconductors encompassing advanced devices, materials growth, characterization, processing, device fabrication, reliability, and other related topics. Papers on both practical issues and fundamental studies are solicited. The following areas are of particular interest: (1.) advances in bulk and epitaxial growth technologies of compound semiconductors (CS); (2.) advances in CS processing; (3.) novel electronic and optoelectronic CS devices; (4.) Schottky and ohmic contact technology for CS; (5.) dielectric and passivation for CS; (6.) bonding and packaging; (7.) *in situ* and *ex situ* process monitoring; (8.) material characterization and wafer level testing and mapping; (9.) process induced defects; (10.) reliability and device degradation mechanisms; and (11.) advances in organic semiconductors. The symposium will consist of both invited and contributed papers.

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Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **A. G. Baca**, Sandia National Labs, e-mail: agbaca@sandia.gov; **J. Brown**, RF Micro Devices, e-mail: JBrown@rfmd.com; **D. N. Buckley**, University of Limerick, e-mail: noel.buckley@ul.ie; and **P. Nam**, Northrop Grumman, e-mail: peter.nam@ngc.com.

## **E8** Processes at the Semiconductor Solution Interface 3

### Electronics and Photonics

This symposium will address the most recent developments in processes at the semiconductor/solution interface including etching, oxidation, passivation, film growth, electrochemical and photoelectrochemical processes, electroluminescence, photoluminescence, and other related topics. It will include both invited and contributed papers on both fundamental and applied topics of both bulk and nanoscale materials.

The following areas are of particular interest: (1.) chemical, electrochemical, and photoelectrochemical etching; (2.) surface film growth and passivation; (3.) porous semiconductor formation and photonic crystal structures; (4.) electroanalytical measurements on both elemental and compound semiconductors including silicon, germanium, both bulk and epitaxial II-VI, III-V, IV-IV, and organic materials in aqueous and non-aqueous electrolytes; (5.) electronic and optical processes at the semiconductor/solution interface; (6.) electroluminescence at the semiconductor/solution interface; (7.) photoluminescence spectroscopy including *in situ* potential-dependant measurements; (8.) electrochemical impedance spectroscopy and investigations of flat-band potential; (9.) combined electrochemical and surface analytical measurements such as XPS; (10.) microscopic and surface analytical measurements on chemically and electrochemically modified semiconductor surfaces; (11.) chemical, electrochemical and photoelectrochemical techniques of device processing including etching, passivation, oxide growth and metallization; (12.) electrochemical

techniques of semiconductor characterization; and (13.) electrochemical investigations of luminescent nanoscale (nanocrystals, nanowires, etc.) III-V and II-VI compound semiconductors.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **C. O'Dwyer**, University of Limerick, e-mail: colm.odwyer@ul.ie; and **A. Etcheberry**, IREM Institut Lavoisier, e-mail: etcheber@chimie.uvsq.fr.

## **E9** SOI Device Technology 14

### Electronics and Photonics

The symposium covers recent significant advances in SOI technologies, SOI-based nanoelectronics, and innovative applications of SOI. It will be of interest to materials and device scientists, as well as to process and applications oriented engineers. Theoretical and experimental contributions are solicited. Specific topics will include, but are not limited to: (1.) synthesis of advanced SOI wafers and materials evaluation, including strained layers on insulator and SOI-like heterostructures formed by bonding, wafer screening, electrical properties, defect and stress identification, interface quality, properties of ultra-thin films and buried oxides, and tools for quality control; (2.) SOI MOSFETs and high performance CMOS and bipolar devices: process integration, low power/voltage and RF circuits, memories, high power/voltage devices, and high/low temperature devices; and (3.) innovative devices: ultra-thin-body FD-SOI MOSFETs, FinFETs and other multiple-gate devices, quantum and tunneling transistors, photonic SOI devices, optical interconnects, sensors and MEMS/NEMS, etc.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Y. Omura**, Kansai University, e-mail: omuray@ipcku.kansai-u.ac.jp; **S. Cristoloveanu**, IMEP-INPG-Grenoble, e-mail: sorin@enserg.fr; **F. Gámiz**, University of Granada, e-mail: fgamiz@ugr.es; and **B.-Y. Nguyen**, SOITEC USA, e-mail: Bich-Yen.Nguyen@soitecusa.com.

## **F — Electrochemical / Chemical Deposition and Etching**

### **F1** Electrochemical Processing in ULSI and MEMS 4

#### Electrodeposition

This symposium will cover advances in electrochemical processes for fabrication of electronic devices and related structures. Topics will include copper metallization and other applications of electrolytic and electroless plating in integrated circuits, packaging, magnetic storage, MEMS and related areas. Specific structures include interconnects, solder balls, pillars, through-silicon vias, barriers, waveguides, electrodes, recording heads, nanowires, and other

nanostructures. Materials of interest include conductors, semiconductors, dielectrics, thermoelectrics, phase-change materials, photovoltaic films, storage media, photonic materials, and nanostructured materials. Contributions ranging from explorations of new processes and applications to advances in understanding and extendibility of established technology are welcome. Various aspects of electrochemical fabrication technology will be featured, such as nucleation, grain growth, surface roughness, morphology, characterization, shape evolution, mechanistic aspects, simulation, equipment, process integration, process control and reliability. Processes of interest include electrodeposition, electroless deposition, chemical bath deposition, electrochemical ALD, and other emerging deposition methods as well as subtractive processes such as CMP and electroetching.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **T. Moffat**, NIST, e-mail: Thomas.moffat@nist.gov; **H. (Lili) Deligianni**, IBM Research, e-mail: lili@us.ibm.com; **J. Dukovic**, Applied Materials, e-mail: john\_dukovic@amat.com; and **J. L. Stickney**, University of Georgia, e-mail: stickney@chem.uga.edu.

## G— Electrochemical Synthesis and Engineering

G1

### Industrial Electrochemistry and Electrochemical Engineering General Session

Industrial Electrochemistry and Electrochemical Engineering

Papers are solicited in areas of industrial electrolysis and electrochemical engineering that are not covered by other symposia at this meeting. Of particular interest are papers concerning: design, operation, testing, and/or modeling of industrial electrochemical systems; electrochemical waste treatment technologies; methods for electrosynthesis; electrolytic recovery of process materials; new electrode materials; new electrochemical cell designs; and electrocatalysis. Presentations on industrially significant areas, such as chlor-alkali and fluorine production; manufacture of aluminum and other metals; the use of electrochemical methods in pulp and paper bleaching; and generation of environmentally- friendly bleaching chemicals and other active oxidants are also encouraged. Papers may contain both theoretical and experimental work, and papers dealing with either area will be considered. Contributed papers will be programmed in a related order, depending on the titles and content of the abstracts.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **G. Pillay**, South Dakota School of Mines and Technology, e-mail: gautam.pillay@sdsmt.edu; and **W. An**, FMC Corporation, e-mail: weidong\_an@fmc.com.

G2

### Leadership and Entrepreneurship in Electrochemical Engineering: A Tutorial Symposium

Industrial Electrochemistry and Electrochemical Engineering

This symposium will present invited speakers who will discuss career and leadership opportunities for professionals trained in science and engineering fields with backgrounds that impact electrochemical technology education, fundamentals, development, and commercialization. Invited speakers from academia, industry, and government will provide insights and recommendations based on their own careers and will discuss the wide variety of professional/development paths available to scientists and engineers in the electrochemical fields, not only in the traditional areas, but also in emerging and multi-disciplinary research and development areas.

Speakers will also discuss entrepreneurial opportunities in electrochemical sciences and engineering. They will provide guidance to assist the interested professional in small business development, grant opportunities, and strategies for building partnerships.

Invited presentations will be programmed in a related order, depending on the titles and content of the abstracts. Only speakers invited by the organizers listed below will present in this symposium and will submit abstracts electronically to the ECS website.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **G. Pillay**, South Dakota School of Mines and Technology, e-mail: gautam.pillay@sdsmt.edu; **R. Savinell**, Case Western Reserve University, e-mail: rfs2@case.edu; and **J. Van Zee**, University of South Carolina, e-mail: vanzee@engr.sc.edu.

G3

### Separators and Membranes for Batteries, Capacitors, Fuel Cells, and Other Electrochemical Systems

Industrial Electrochemistry and Electrochemical Engineering

Advances in batteries and fuel cells continue to be enabled by advances in the performance and reduction in the cost of critical materials. Separators and membranes play a very important role in batteries and fuel cells. Continued advancement in separator technology has helped in achieving higher performance and safer lithium-ion cells, which needs to be continued in future. Future developments in proton exchange membranes are essential for the commercialization of PEM type fuel cells.

The purpose of the symposium is to provide a forum for the presentation and discussion of recent progress in the development of separators and membranes for batteries, capacitors, fuel cells and other electrochemical systems. The symposium will focus on both basic and applied research findings that have led to improved materials and findings that guide materials development. Separator and membranes for all types of electrochemical systems (e.g., batteries, capacitors, fuel cells) are of interest including aqueous (e.g., nickel-cadmium, nickel-zinc, zinc-air, lead-acid, and nickel-metal hydride), non-aqueous electrolyte batteries (e.g., lithium, lithium-ion, and lithium polymer batteries), and fuel cells (e.g., PEM, DMFC, alkaline, PAFC,



SOFC, and MCFC). Modeling papers for prediction of material properties and guiding materials development, are also of interest. The symposium will include both invited and contributed papers.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **P. Arora**, DuPont, e-mail: pankaj.arora@usa.dupont.com; and **V. Ramani**, Illinois Institute of Technology, e-mail: ramani@iit.edu.

## **G4 Multiscale Modeling of Electrochemical Systems 3**

Industrial Electrochemistry and Electrochemical Engineering / Energy Technology

The behavior of electrochemical systems is frequently governed by concerted interactions between electrochemical phenomena that extend over many time and length scales. Numerical simulation of electrochemical systems thus requires solving equations simultaneously as well as efficiently in different length and time scales. It is not possible to accurately describe these systems using a single approach such as continuum modeling.

Papers describing innovative approaches to describe complex electrochemical systems are solicited. Papers of interest include but are not restricted to the following: nano-macro scale coupled simulation, micro-macro scale coupled simulation, stability issues during coupling of different scales, approximation methods, parallel computing, parameter estimation, efficient numerical solvers, novel numerical techniques, multiple steady states, comparison of numerical methods, and moving boundary problems. Applications include, but not limited to electro/electroless deposition, solid electrolyte interface, secondary batteries, fuel cells, electrochemical capacitors, and hybrid power sources.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **V. Ramani**, Illinois Institute of Technology, e-mail: ramani@iit.edu; **S. R. Narayanan**, Jet Propulsion Laboratory, e-mail: s.r.narayanan@jpl.nasa.gov; and **V. Subramanian**, Tennessee Tech University, e-mail: vsubramanian@ntech.edu.

## **G5 Tutorials in Electrochemical Technology — Current Distribution**

Industrial Electrochemistry and Electrochemical Engineering

This symposium provides a forum for tutorial presentations concerning all aspects of current distribution in electrochemical processes. Contributions related to both fundamentals and applications are encouraged. Papers are solicited as well on the influence of current distribution on interpretation of experimental results, on development of mathematical models that account for current distribution, and on the role of current distribution in electrochemical processes, devices, and applications. The tutorials should be

useful for students and for professionals seeking to diversify their background or break into new technological areas. The symposium will consist of both invited and contributed papers.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **M. E. Orazem**, University of Florida, e-mail: meo@che.ufl.edu; and **J. M. Fenton**, University of Central Florida, e-mail: jfenton@fsec.ucf.edu.

## **H— Fullerenes, Nanotubes, and Carbon Nanostructures**

### **H1 to H9 Fullerenes, Nanotubes, and Carbon Nanostructures**

Papers are invited for this symposium in the areas listed below. The organizers of each symposium will determine the suitability of the papers for inclusion in the oral or poster presentation of the program.

Abstracts should be submitted via the ECS website. Comments and inquiries about the symposium may be sent to the organizers: **D. M. Guldi**, Friedrich-Alexander-Universität Erlangen-Nürnberg, e-mail: dirk.guldi@chemie.uni-erlangen.de; and **R. B. Weisman**, Rice University, e-mail: weisman@rice.edu. Abstracts, suggestions, and inquiries should be sent electronically to the ECS headquarters office and to the organizers of the corresponding symposium listed below.

### **H1 Electron Transfer and Applications of Fullerene and Nanostructured Materials**

Fullerenes, Nanotubes, and Carbon Nanostructures

Papers are invited in the following areas of fullerenes and carbon nanotubes: electrochemistry, photochemistry, electron transfer chemistry, photoelectrochemistry, photovoltaic applications, catalysis, sensor studies, and applications of fullerenes and related compounds (carbon nanotubes, organofullerenes, electroactive fullerenes, supramolecular fullerenes, organometallic fullerenes, endohedral fullerenes, fullerene films and composites).

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## H2 Molecular and Supramolecular Chemistry of Fullerenes and Carbon Nanotubes

### Fullerenes, Nanotubes, and Carbon Nanostructures

The purpose of this symposium is to provide a forum for the presentation of original research concerned with all aspects of chemical functionalization of fullerenes and carbon nanotubes. This rapidly growing area includes nucleophilic and radical additions, cyclo-additions, hydrogenations, transition metal complex formation, oxidations, and reactions with electrophiles. Also included are contributions on multiple additions to fullerenes, ring opening reactions, synthesis of heterofullerenes, as well as studies toward the total synthesis of fullerenes. The mentioned topics may be considered as representative examples and should not be regarded as restrictive.

**An issue of *ECS Transactions* may be published "AFTER" the meeting. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 22, 2009. All manuscripts will be submitted online, and must be in either MS Word or PDF format.**

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **N. Martin**, Complutense University, e-mail: nazmar@quim.ucm.es; and **J. F. Nierengarten**, Groupe de Chimie des Fullerènes et des Systèmes Conjugués, e-mail: jfnierengarten@lcc-toulouse.fr.

## H3 Carbon Nanotubes and Nanostructures: Fundamental Properties and Processes

### Fullerenes, Nanotubes, and Carbon Nanostructures

This is one of two related symposia on carbon nanotubes and related materials. This symposium will be focused on fundamental properties and processes in physics, chemistry, and materials science. Topics may include methods for sample preparation and characterization; mechanical, thermal, optical, and electronic properties; chemical and electrochemical behavior; and theoretical studies.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **R. B. Weisman**, Rice University, e-mail: weisman@rice.edu; **M. Zheng**, DuPont, e-mail: ming.zheng@usa.dupont.com; and **M. Heben** NREL, e-mail: michael\_heben@nrel.gov.

## H4 Carbon Nanotubes and Nanostructures: Applications and Devices

### Fullerenes, Nanotubes, and Carbon Nanostructures / Sensor

This is the second of two related symposia on carbon nanotubes and related materials. The theme of this symposium is applications of carbon nanomaterials. Topics may include novel applications in the areas of electronic devices, sensors, materials development, solar energy harvesting, catalysis, nano-mechanical devices, biomedicine, environmental remediation, etc.

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**text manuscript for the issue no later than June 22, 2009. All manuscripts will be submitted online, and must be in either MS Word or PDF format.**

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **S. Rotkin**, Lehigh University, e-mail: rotkin@lehigh.edu; and **Y. Gogotsi**, Drexel University, e-mail: gogotsi@drexel.edu.

## H5 Endofullerenes and Carbon Nanocapsules

### Fullerenes, Nanotubes, and Carbon Nanostructures

Original papers are solicited on all aspects of endofullerenes such as endohedral metallofullerenes and endohedral rare-gas and other types of fullerenes. Papers on carbon nanocapsules and metal encapsulates are also welcome. The topics of this symposium include synthesis, characterization, and properties of different types of endofullerenes and carbon nanocapsules.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **H. Shinohara**, Nagoya University, e-mail: noris@cc.nagoya-u.ac.jp; **T. Akasaka**, University of Tsukuba, e-mail: akasaka@tara.tsukuba.ac.jp; and **A. Balch**, University of California, e-mail: albalch@ucdavis.edu.

## H6 Energetics and Structure and Solid-State Physics

### Fullerenes, Nanotubes, and Carbon Nanostructures

Original research papers that address both theoretical and experimental aspects of fullerenes and carbon nanoclusters are being solicited for this symposium. The topics include quantum chemistry, topology, statistical mechanics, molecular dynamics, thermodynamics, kinetics, thermal properties, solubility, mechanism, ionization, collisions, electronic properties, and catalysis.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Z. Slanina**, Institute of Chemistry, Academia Sinica, e-mail: slanina@cochem2.tutkie.tut.ac.jp; **O. Boltalina**, Colorado State University, e-mail: ovbalt@lamar.colostate.edu; and **P. Reinke**, University of Virginia, e-mail: petrareinke@virginia.edu.

## H7 Carbon Nanotubes and Nanostructures: Medicine and Biology

### Fullerenes, Nanotubes, and Carbon Nanostructures / Nanotechnology Subcommittee

Original papers are solicited on all aspects of pharmaceutical, biological, biotechnology, and medical applications of fullerenes, metallofullerenes, and nanotubes.

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**presentation are encouraged to submit their full text manuscript for the issue no later than June 22, 2009. All manuscripts will be submitted online, and must be in either MS Word or PDF format.**

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **T. Da Ros**, Università di Trieste, e-mail: daros@univ.trieste.it; **L. Wilson**, Rice University, e-mail: durango@ruf.rice.edu; and **A. Hirsch**, Friedrich-Alexander-Universität Erlangen-Nürnberg, e-mail: andreas.hirsch@chemie.uni-erlangen.de.

**H8**

## **Porphyrins and Supramolecular Assemblies**

Fullerenes, Nanotubes, and Carbon Nanostructures

The purpose of this symposium is to highlight recent advances in porphyrin chemistry. Through this symposium, we intend to cover a wide range of topics in order to generate discussions between interdisciplinary participants and favor the exchange of new ideas. We are thus soliciting high-quality contributions in areas ranging from the synthesis of challenging porphyrinic devices to the characterization of electrochemical and physicochemical behavior of new porphyrinic materials.

Submission of papers is encouraged in the following topics: (1.) new challenging multi-porphyrinic devices; (2.) electronic properties of porphyrinic arrays; (3.) photo-induced processes in molecular and supra-molecular porphyrinic assemblies; and (4.) novel porphyrin modified electrodes.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **N. Sollandie**, Nathalie Sollandie Groupe de Synthèse de Systèmes Porphyriniques (G2SP), Laboratoire de Chimie de Coordination du CNRS, e-mail: solladie@lcc-toulouse.fr; and **K. Kadish**, University of Houston, e-mail: kkadish@uh.edu.

**H9**

## **Metallic and Semiconducting Nanoparticles for Energy Conversion**

Fullerenes, Nanotubes, and Carbon Nanostructures

Metal and semiconductor nanoparticles play an important role in fuel cells, solar energy conversion, catalysis, and hydrogen production. The recent advances in the area of nanostructured materials have led to a new understanding of the catalytic and photoelectrochemical properties of these nanomaterials and composites. Papers are invited in the following areas: synthesis and characterization of metal nanoparticles; functionalization with chromophores, bimetallic particles, and semiconductor-metal composites; size and shape dependent catalytic properties; hydrogen evolution reactions; photochemical solar cells; and photocatalysis and electron transfer processes that are relevant to energy conversions.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **P. Kamat**, Notre Dame Radiation Laboratory, e-mail: pkamat@nd.edu; and **H. Imahori**, Kyoto University, e-mail: imahori@kyoto-u.ac.jp.

**H10**

## **First International Symposium on Graphene and Emerging Materials for Post-CMOS Applications**

Dielectric Science and Technology / Electronics and Photonics / Fullerenes, Nanotubes, and Carbon Nanostructures

The objectives of this symposium are to assemble researchers and technical support personnel from industry, universities, and government laboratories around the globe to address all current and future issues related to emerging materials for post-CMOS applications. This symposium will address the fundamental materials science, characterization, and applications of emerging materials designed for alternatives technologies to replace CMOS. Special emphasis on will be placed on "Beyond CMOS" integration schemes/technology development and on the impact of non-traditional materials into nanoelectronics.

Papers will be solicited in the following areas: emerging research in materials science and technology; emerging research in materials processing and modeling; emerging research in materials and process integration issues; emerging research in materials-related defect detection and characterization; electrical characterization of emerging research materials; ESH of emerging research materials; and an introduction to "More than Moore" and "Beyond CMOS" integration schemes/technology.

Keywords: complex metal oxides, advanced gate-stack integration, strongly correlated electron materials, alternate channel materials (Ge/III-V, etc.), graphitic materials (carbon nanotubes, graphene), spin materials, and nanowires.

**A hard-cover issue of ECS Transactions is planned to be available "AT" the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than February 9, 2009. All manuscripts will be submitted online, and must be in either MS Word or PDF format.**

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Y. Obeng**, NIST, e-mail: yaw.obeng@nist.gov; **S. De-Gendt**, IMEC, Stefan.Degendt@chem.kuleuven.be; **P. Srinivasan**, Texas Instruments, psrinivasan@ti.com; **D. Misra**, New Jersey Institute of Technology, e-mail: dmisra@njit.edu; **H. Iwai**, Tokyo Institute of Technology, e-mail: iwai@ep.titech.ac.jp; **Z. Karim**, zkarim@genus.com; **D. Hess**, Dennis.Hess@chbe.gatech.edu; **J. Ruzillo**, jxr6@psu.edu; **H. Grebel**, grebel@njit.edu; **P. V. Kamat**, kamat.1@nd.edu; and **F. D'Souza**, Francis.DSouza@wichita.edu.

## **I — Physical and Analytical Electrochemistry**

**I1**

### **Physical and Analytical Electrochemistry General Session**

Physical and Analytical Electrochemistry

Papers concerning any aspect of physical electrochemistry not covered by topic areas of other specialized symposia at this meeting are welcome. Contributed papers will be



programmed in some related order, depending on the titles and contents of the submitted abstracts.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizer: **P. Trulove**, U.S. Naval Academy, e-mail: trulove@usna.edu.

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## Electrochemical Detection of Pathogens

Physical and Analytical Electrochemistry

The organizers of this symposium are soliciting research papers in all areas of solid state and electrochemical science and technology that lead toward identification, quantification, and understanding of pathogens. Topics may be fundamental or applied and include (but are not limited to): (1.) immuno-, DNA-, and RNA-hybridization assays; (2.) pathogen-recognition materials (e.g., molecularly imprinted polymers); (3.) amperometric and potentiometric methods; (4.) scanning electrochemical microscopy; (5.) arrays for assessing reproducibility and achieving multi-pathogen analysis; (6.) multiplexing; (7.) electrode fouling in pathogen samples; (8.) single-pathogen detection; (9.) growth, death, and metabolism; (10.) the role of electrochemistry in sample preparation and pathogen capture or concentration; (11.) interfacing detection with lab-on-a-chip technology; and (12.) communication among pathogens and between pathogens and their surrounding environment.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **C. Kranz**, Georgia Institute of Technology, e-mail: christine.kranz@chemistry.gatech.edu; and **I. Fritsch**, University of Arkansas, e-mail: ifritsch@mail.uark.edu.

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## Electrochemistry in Medicine and Biomedical Applications

Physical and Analytical Electrochemistry /  
Organic and Biological Electrochemistry / Sensor

The symposium solicits papers covering the aspects of electrochemistry in the field of medicine and biomedical technology. Papers on a wide scope of electrochemistry related to electrotherapy, neurochemistry, cardiology, and biomaterials are invited. Specific areas of interest include, but are not limited to: (1.) electrochemical cancer therapy; (2.) biochemical sensors; (3.) analytical chemistry in medical research; (4.) drug delivery applications; (5.) nerve signal transmission/transduction; (6.) neuro-stimulation; and (7.) cardiac stimulation (power sources in pacemakers and defibrillators).

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **C. Bock**, National Research Council of Canada, Institute for Chemical Processes and Environmental Technologies, e-mail: Christina.Bock@nrc-cnrc.gc.ca; **J. Burgess**, Case Western Reserve University, e-mail: jdb22@po.cwru.edu; **B. Eggers**, Bio-Logic USA, LLC., e-mail: bill.eggers@bio-logic.us; **C. Holmes**, Greatbatch Inc, e-mail: cholmes@greatbatch.com; **M. Urquidi-Macdonald**, Pennsylvania State University, e-mail: mumesm@engr.psu.edu.

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## Impedance in Electrochemistry: From Analytical Applications to Mechanistic Speculation 2

Physical and Analytical Electrochemistry /  
Corrosion / Industrial Electrochemistry and  
Electrochemical Engineering

The purpose of this symposium is to bring together leading experts with different experimental and theoretical skills working in areas of electrochemical impedance and in other areas, where impedance is used as a tool. Impedance spectroscopy based measurements represent a rich multidisciplinary area of science that has been applied to important areas of research, such as: (1.) analytical applications, (2.) determination of fundamental values of ion transport and electrode kinetics, (3.) studies of reaction mechanisms, (4.) corrosion studies and corrosion control; (5.) monitoring of properties of electronic and ionic polymers and coatings; (6.) measurements in energy storage, batteries, and fuel cell related systems; (7.) measurements of semiconductors, solid electrolytes, and electronic conductors; and (8.) studies of biological, biocellular, and biomedical materials.

The aim is to show the power of electrochemical impedance spectroscopy for analytical applications, both quantitative and qualitative, as well as its usefulness for the needs of physical electrochemistry, where the data analysis will seek fundamental interpretation. Both contributions with well understood interpretation and papers with tentative postulates of impedance data relationship to physical parameters will be considered.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **P. Vanýsek**, Department of Chemistry and Biochemistry, Northern Illinois University, e-mail: pvanýsek@niu.edu; **D. Hansen**, University of Dayton Research Institute, Materials Engineering Division, e-mail: douglas.hansen@udri.udayton.edu; and **M. E. Orazem**, University of Florida, e-mail: meo@che.ufl.edu.

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## Nanostructured Materials: Chemistry and High Temperature Applications

High Temperature Materials / Physical and  
Analytical Electrochemistry / Sensor / Corrosion

New nanostructured materials are now being created as a result of developments in synthetic chemistry and materials science. These include nanoporous materials such as: metal organic frameworks, aluminum and anodized aluminum oxide, carbon nanotubes, block copolymers, zeolites, nanostructured carbons and fullerenes. Nanostructured

materials may be dense or have pores ranging in size from a few angstroms to tens of nanometers and exhibit many interesting properties: extremely high surface area, low density, gas storage capacity, selective molecular binding, remarkable high-temperature stability, luminosity, and ferro- or antiferromagnetism. Methods to control the nanostructure are improving and the application of high-level quantum chemistry methods are beginning to reveal the mechanisms behind some of their unusual properties. As a result, there is growing interest in a host of applications, including gas storage, separations, catalysis, drug delivery, and sensing.

Despite the numerous methods that allow the synthesis of nanostructured oxide particles and films, there are still problems in maintaining the structure at the nano-sized level after sintering and in the final device, especially for high temperature applications. For these applications, thermal stability of nanostructured materials under operation is another important issue for their application.

This symposium will highlight the latest developments in the field of nanostructured materials, particularly their chemical aspects, but also critical issues in materials science required for the design, fabrication, and performance of devices that utilize them. Papers are solicited in the following and related areas: (1.) synthetic and reaction chemistry of nanostructured materials; (2.) formation of nanostructured films or material hybrids on substrates or supports to enable gas- or liquid-phase separations and high-temperature applications such as catalysis; (3.) modeling and theory to predict and optimize the structure or reaction chemistry and environment; (4.) measurements and characterization, including gas sorption, diffusion, catalysis, and electro-optical properties; (5.) processing of nanostructured materials and investigation of their thermal and chemical stability; (6.) development of devices such as molecular and solid-state chemical sensors, separation membranes, solar cells, supercapacitors, batteries, and fuel cells; and (7.) novel applications such as targeted drug delivery.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **T. Armstrong**, Oak Ridge National Laboratory, e-mail: armstrong@ornl.gov; **G. Hunter**, NASA Glenn Research Center, e-mail: Gary.W.Hunter@nasa.gov; and **E. Traversa**, University of Rome Tor Vergata, e-mail: traversa@uniroma2.it.

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## Novel Electrode Materials

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

Papers are solicited on the use, application, and characterization of novel electrode materials for all electrochemical systems, including electrochemical capacitors, electrochemical waste remediation systems, electrical field flow fractionation, fuel cells, electrochemical detections, and electrolysis.

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to the symposium organizers: **S. Minteer**, Saint Louis University, e-mail: minteer@slu.edu; and **B. Lakshmanan**, General Motors, e-mail: balsu.lakshmanan@gm.com.

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## Role of Electrochemistry in Addressing Climate Change

Physical and Analytical Electrochemistry / Energy Technology

This symposium targets electrochemical research that leads to a better understanding of climate change or can impact it directly through advances in energy technology or through minimization and cleanup of emissions. Scientists recognized for their work concerning climate change will speak on several important topics including: environmental analysis, materials, batteries, fuel cells, and photoelectrochemistry. Both experimental and theoretical studies will be presented.

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## J — Sensors and Displays: Principles, Materials, and Processing

J1

### Sensors, Actuators, and Microsystems General Session

Sensor

This symposium will address all aspects of sensor, actuator, and microsystems research and development. The inclusion of sensors and actuators into a range of application environments has been significantly increasing in order to provide improved system capabilities such as increased performance, decreased environmental impact, or higher efficiency. Sensors and actuators are often integrated into "smart" microsystems: microfabricated sensors and/or actuators combined with electronics which enable, for example, signal conditioning and data processing. The need for multifunctional, smart technologies which depend on sensors, actuators, and electronics is expected to increase in the coming years as further demands and expectations are placed on systems and devices. This general session welcomes papers on all aspects of sensors, actuators, and microsystems not covered in other sessions.

This symposium intends to bring together a range of interdisciplinary topics and covers all materials aspects of sensors, actuators, and microsystems. Primary emphasis will be placed upon applied aspects of the materials, synthesis, evaluation, and development strategies of novel materials/device configurations for sensing and actuating functions as well as integrated microsystems. High temperature as well as low temperature applications will be discussed. Papers are solicited in, but not limited to, the following areas: (1.) physics and chemistry of sensor and actuator materials, fabrication and characterization of novel compositions; (2.) novel routes for the synthesis of materials with grain (pore)

size control and distributions; (3.) novel sensor and actuator concepts, design, modeling, and verification; (4.) sensing systems that include sampling systems and actuators like sensor arrays, electronic noses and tongues; (5.) physical, chemical, and biological sensors and actuators, such as gas, humidity, ion or molecular sensors, their system integration and actuating functions; (6.) optical, RF and wireless sensors and actuators, such as fiber optic sensors, microwave sensors, optical and wireless integrations; (7.) emerging technologies and applications including sensors based on nanotechnology; and (8.) novel techniques to expand and insure sensor stability and reliability.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **G. Hunter**, NASA Glenn Research Center, e-mail: ghunter@grc.nasa.gov; **Z. Aguilar**, Vegrandis, LLC, e-mail: zapaguilar@yahoo.com; **S. Bhansali**, University of South Florida, e-mail: bhansali@eng.usf.edu; **M. Carter**, Eltron Research, Inc., e-mail: mcarter@eltronresearch.com; and **R. Mukundan**, Los Alamos National Lab, e-mail: mukundan@lanl.gov.

## **J2** Thirty-Five Years of Chemical Sensors: A Symposium in Honor of Professor Jiri Janata

Sensor / Physical and Analytical Electrochemistry

This symposium honors Professor Jiri (Art) Janata for his 35 years of contribution to the development of chemical sensors. Meanwhile, it serves as a celebration of Professor Janata's 70<sup>th</sup> birthday. This symposium will focus on all aspects of chemical sensor technology including organic semiconductor devices, sensing materials, micro/nanomachining, fabrication processes, packaging, and the application of these structures and processes to the miniaturization of chemical sensors, biosensors, miniature chemical analysis systems and other devices and methods for chemical analysis. Where appropriate, theoretical discussions of sensing mechanisms will also be welcome.

The following is a partial list of topics to be solicited: (1.) novel materials for sensors; (2.) higher order sensing arrays; (3.) fabrication and processing of nano/micro devices and systems; (4.) novel methods of chemical analysis; (5.) electrical, optical, and chemical characterization of sensing materials; (6.) chemical, electrical, and physical testing of sensor devices; (7.) integration of sampling systems and sensors; (8.) signal processing of high order sensor arrays; and (9.) applications of chemical sensors.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **J. Li**, NASA Ames Research Center, e-mail: Jing.Li-1@nasa.gov; **R. Brown**, University of Utah, e-mail: brown@utah.edu; **C. Bruckner-Lea**, Pacific Northwest National Laboratory, e-mail: cindy.bruckner-lea@pnl.gov; **D. Hatchet**, University of Nevada, e-mail: dahatchet@ccmail.nevada.edu; **M. Josowicz**, Georgia Institute of Technology, e-mail: mira.josowicz@chemistry.gatech.edu; and **P. Vanýsek**, Northern Illinois University, e-mail: pvanysek@niu.edu.

## **J3** Sensor Applications: Food Safety, Agricultural, and Environmental Sensors Sensor / Organic and Biological Electrochemistry / Physical and Analytical Electrochemistry / New Technology Subcommittee

The growing concern for food safety, agricultural crop protection, and environment contamination warrants an urgent call for developing sensors to assess the threat in an accurate, sensitive, rapid, and selective fashion. This symposium, a continuation of previous symposia, aims to bring together researchers from academia and the industry to address these concerns. The main focus is on present and recent efforts in the development of technologies and implementation of technical solutions to meet the demands for safeguarding the food industry, agricultural crops, and the environment. Invited to participate are all those in academia, government, or industry involved in the development of novel concepts and ideas on sensors suited for chemical and biological contaminants in food, agricultural, or environmental samples in all platforms, and detection methods such as electrochemical, optical, fluorescence, and other methods of detection. Automation and integration of the capture platform, reagent delivery, and signal detection in a single instrument that eliminates the separation of bound and unbound ligand, and disposable lab-on-a-chip type sensors are among the recent developments that will be included in this symposium.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **A. Simonian**, Auburn University, e-mail: als@eng.auburn.edu; **Z. Aguilar**, Vegrandis, LLC, e-mail: zapaguilar@yahoo.com; **S. Bhansali**, University of South Florida, e-mail: bhansali@eng.usf.edu; **W. Buttner**, Illinois Institute of Technology, e-mail: buttner@itt.edu; **G. Hunter**, NASA Glenn Research Center, e-mail: ghunter@grc.nasa.gov; and **I. Taniguchi**, Kumamoto University, e-mail: taniguch@gpo.kumamoto-u.ac.jp.