

212TH ECS MEETING

Washington, DC

October 7-12, 2007

ECS[®]



CALL FOR PAPERS

Abstract Deadline: May 18, 2007



Washington, DC

The 212th ECS Meeting will be held October 7-12, 2007. This major international conference offers a unique blend of electrochemical and solid-state science and technology; and serves as a major forum for the discussion of interdisciplinary research from around the world through a variety of formats, such as oral presentations, poster sessions, exhibits, and tutorial sessions.

- Abstracts are due no later than May 18, 2007.
- The abstract submission site for this meeting opens February 5, 2006.
- NOTE: Some abstracts are due earlier than May 18, 2007.

Abstract Submission and Deadlines

Please carefully check the individual symposium listing for any alternate abstract submission deadlines. For complete details on abstract submission and symposia topics, please visit the ECS website.

Submit one original meeting abstract electronically via www.electrochem.org, no later than May 18, 2007. Faxed abstracts, late abstracts, and abstracts more than one page in length will not be accepted. In July 2007, 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/abstracts/templates.htm>. Programming for this meeting will occur in June and July of 2007, 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 July of 2007. 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 issue 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 issue 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://ecsd.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 elsewhere in this Call for Papers).

Hotel Reservations

The 212th Meeting will be held at the Hilton Washington, located at 1919 Connecticut Avenue NW, Washington, District of Columbia, United States 20009.

Special rates have been reserved at the Hilton Washington for participants attending this meeting. The reservation deadline is **September 5, 2007**. Please refer to ECS website for rates and reservations.

Meeting Registration

All participants, including authors and invited speakers of the 212th Meeting, are required to pay the appropriate registration fees. Hotel and meeting registration materials will be distributed in July of 2007 and will also be available on the ECS website. The deadline for advance registration is **September 5, 2006**.

Short Courses

A number of short courses will be offered on Sunday, October 7, 2007 from 9:00 AM-4:30 PM. Short Courses require advance registration and may be cancelled if enrollments are too low. Please check the ECS website for a list of offerings.

Technical Exhibit

The 212th 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 staffed by company representatives cost \$1,800 and include one free meeting registration. Literature display tables (unstaffed by company representatives; no meeting registration included) will also be available for \$850. Parties interested in exhibiting should contact Amir Zaman at sponsorship@electrochem.org 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 sponsorship@electrochem.org.

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; Web: www.electrochem.org.

SYMPOSIUM TOPICS

A General Topics

- A1—General Student Poster Session
- A2—IDEAS: Intriguing Disclosures on Electrochemical Advances Symposium
- A3—Nanotechnology General Session

B Batteries, Fuel Cells, and Energy Conversion

- B1—Battery/Energy Technology Joint General Session
- B2—Battery Safety and Abuse Tolerance
- B3—Energy Efficient Technologies for Water Treatment
- B4—Interfacial Electrochemistry and Chemistry in High Temperature Media
- B5—Large-Scale Energy Storage Devices
- B6—Modeling of Electrochemical Power Sources
- B7—Nanomaterials for Energy Conversion and Storage
- B8—Next Generation Photovoltaics
- B9—Nickel-Metal Hydride Batteries
- B10—Proton Exchange Membrane Fuel Cells (PEMFC 7)
- B11—Rechargeable Lithium and Lithium Ion Batteries
- B12—Solid-State Ionic Devices 5

C Biomedical Applications and Organic Electrochemistry

- C1—Surface Treatment for Biomedical Applications

D Corrosion, Passivation, and Anodic Films

- D1—Corrosion General Session
- D2—High Resolution Characterization of Corrosion Processes
- D3—Light Alloys 3
- D4—Modeling and Simulation of Dissolution and Corrosion Processes

E Dielectric and Semiconductor Materials, Devices, and Processing

- E1—Atomic Layer Deposition Applications 3
- E2—Cleaning and Surface Conditioning Technology in Semiconductor Device Manufacturing 10
- E3—Analytical and Diagnostic Techniques for Semiconductor Materials, Devices, and Processes
- E4—High Dielectric Constant Materials and Gate Stack 5
- E5—Nanocrystal Embedded Dielectrics for Electronic and Photonic Devices
- E6—Nanoscale One-Dimensional Electronic and Photonic Devices
- E7—Organic Semiconductor Materials and Devices

- E8—State-of-the-Art Program on Compound Semiconductors (SOTAPOCS 47)

- E9—ULSI Process Integration 5

- E10—Wide-Bandgap Semiconductor Materials and Devices 8

F Electrochemical/Chemical Deposition and Etching

- F1—Current Trends in Electrodeposition (an invitational symposium)
- F2—Electrodeposition of Nanoengineered Materials and Alloys 2
- F3—Stress Related Phenomena in Electrochemical Systems

G Electrochemical Synthesis and Engineering

- G1—Leadership and Entrepreneurship in Electrochemical Engineering: A Tutorial Symposium

I Physical and Analytical Electrochemistry

- I1—Physical and Analytical Electrochemistry General Session
- I2—Electrochemical Scanning Probe Microscopy: From Theory to Real-World Applications
- I3—Hyphenated Methods in Electroanalytical Chemistry
- I4—Microfluidics for Electrochemical Systems
- I5—Multifunctional Carbon Materials for Electrochemical and Electronic Applications 2
- I6—Photoelectrochemistry

J Sensors and Displays: Principles, Materials, and Processing

- J1—Impedance and Capacitive Based Sensors
- J2—Physics and Chemistry of Luminescent Materials 16
- J3—Sensor, Actuators, and Microsystems General Session
- J4—Sensor Array and Multi-Dimensional Sensor Systems

Student Travel Grants

Several of the Society's Divisions offer travel assistance to students presenting papers at Society meetings. These travel grants are intended to aid students in attending the meeting. For additional information and online application form refer to the ECS website. To be eligible for a grant, applications must be scheduled to present a paper in a symposium or

session sponsored or cosponsored by the Division to which the application is made. For an up-to-date list of symposia and how to submit a paper, please visit www.electrochem.org. To apply for a travel grant use the application form below.

Application Requirements—All applications for the 212th meeting in Washington, DC, October 7-12, 2007,

must be received no later than May 18, 2007. To apply for travel support, please complete the Student Travel Grant form below, return it with a letter of recommendation from a faculty advisor, and a copy of the meeting abstract. Travel grants range from \$250-\$1,000 depending on the student's estimated expenses and the funds available from Divisions. ■

Travel Grant Application Washington, DC

The Society's Battery, Corrosion, Electrodeposition, Electronics and Photonics, Energy Technology, High Temperature Materials (HTM), Industrial Electrolysis and Electrochemical Engineering (IEEE), Organic and Biological Electrochemistry (OBE), Physical and Analytical Electrochemistry, and Sensor Divisions offer travel grants to students presenting papers at the Society's next meeting, in Washington, DC, October 7-12, 2007. To apply, complete this application and send it along with a copy of your transcript and a letter from an involved faculty member attesting both to the quality of the student's work and financial needs, and a copy of the student's meeting abstract. For additional information please contact the Division contact below, as requirement might differ between Divisions.

Meeting Site: _____

Name: _____

School Address: _____

E-mail: _____ Phone #: _____

Undergraduate Year (U) or Graduate Year (G) - circle one: U3 U4 G1 G2 G3 G4 G5

Major Subject: _____ Grade point average _____ out of possible _____
(please provide a letter of recommendation from your faculty advisor and a copy of your transcript)

Symposium Title (#): _____

Title of paper to be presented at the meeting: _____

Are you an ECS Student Member of the Society? ☐ yes ☐ no
(if not, please additionally submit the Awarded Student Membership application.)

Estimated meeting expenditures: \$ _____

Signature: _____ Date: _____

Check Division under which award is being applied for: (Applications made to multiple Divisions will be rejected)

- ☐ **Battery**—Send to: A. Manthiram, Univ. of Texas, ETC 9-104, Austin, TX 78712-0292, USA. E-mail: rmanth@mail.utexas.edu
- ☐ **Corrosion**—Send to: N. Missert, Sandia National Labs, MS 1415, P.O. Box 5800, Albuquerque, NM 87185-0100, USA. E-mail: namisse@sandia.gov
- ☐ **Electrodeposition**—Send to: L. Deligianni, IBM T J Watson Research Center, 1101 Kitchawan, Yorktown Heights, NY 10598, USA. E-mail: lili@us.ibm.com
- ☐ **Electronics and Photonics**—Send to: F. Ren, University of Florida, Dept. of Chem. Engr., Gainesville, FL 32611, USA. E-mail: ren@che.ufl.edu
- ☐ **Energy Technology**—Send to: S. Calabrese Barton, Michigan State University, Dep. of Chem. Eng. and Matls. Sci., 2527 Engineering Building, East Lansing, MI 48824, USA. E-mail: scb@msu.edu
- ☐ **HTM**—Send to: J. Fergus, Materials Research and Education Center, 275 Wilmore Laboratories, Auburn, AL 36849, USA. E-mail: jwfergus@eng.auburn.edu
- ☐ **IEEE**—Send to: D. Mah, IE&EE Division Chair, 2609 Majestic Dr., Wilmington, DE 19810, USA. E-mail: doctor_electro@msn.com
- ☐ **OBE**—Send to: I. Taniguchi, Kumamoto University, Fac. of Eng, Dept. of Appl. Chem. & Biochem., 2-39-1 Kurokami, Kumamoto 860-8555, Japan. E-mail: taniguch@gpo.kumamoto-u.ac.jp
- ☐ **Physical and Analytical Electrochemistry**—Send to: P. Trulove, U.S. Naval Academy, Chemistry Department, 582M Holloway Road, Stop 9B, Annapolis, MD 21402-5026, USA. E-mail: trulove@usna.edu
- ☐ **Sensor**—Send to: Y-L. Chang, Nanomix, Inc., 5980 Horton Street, Suite 600, Emeryville, CA 94608, USA. E-mail: ychang@nano.com

Applications for Travel Grants for the Washington, DC meeting must be received no later than May 18, 2007.

Washington, DC Call for Papers | October 7-12, 2007

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* 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 November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically via ECS website, and questions and inquiries should be sent to the symposium organizers: **G. Botte**, Ohio University, e-mail: botte@bobcat.ent.ohiou.edu; **V. Subramanian**, Tennessee Technological University, e-mail: vsubramanian@tntech.edu; and **V. Desai**, New Mexico State University, e-mail: vimalc@nmsu.edu.

A2

IDEAS: Intriguing Disclosures on Electrochemical Advances Symposium

New Technology Subcommittee

IDEAS—Intriguing Disclosures on Electrochemical Advances Symposium—is a new symposium structure for the Society. In IDEAS, presentations of cutting edge, revolutionary developments in electrochemistry, electrochemical engineering, and solid state science and technology will be made. Approximately four presentations will be made in one session. Typically, the presentation topics will be unrelated.

All presentations are by invitation only. No papers will be accepted based on submitted abstracts. Invited speakers should submit abstracts electronically to the ECS website.

Appropriate speakers may be *nominated* by others. To nominate a speaker, please send a brief e-mail to the symposium organizer. In the message, include the nominee's name and contact information as well as a few sentences as to why the nominee's research warrants the special attention of ECS. References to recent papers may be appropriate.

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Comment and inquiries about IDEAS should be sent to the organizers: **J. Leddy**, University of Iowa, e-mail:

johna-leddy@uiowa.edu; and **D. Hess**, Georgia Institute of Technology, e-mail: dennis.hess@chbe.gatech.edu.

A3

Nanotechnology General Session

All Divisions

The number of applications for materials that are prepared on a nanometer scale is expanding rapidly. The preparation and characterization of materials and composites on a nanometer scale are of prime importance for the advancement of these applications. Examples include catalysts for fuel cell applications and semiconductors for photovoltaic and photoelectrochemical solar energy conversion, and chemical and biological sensors. This symposium will focus on critical issues and the latest advancements in the science and technology of nanostructured materials. Papers are solicited in all areas related to materials including metals, semiconductors, molecular electronics, and organic compounds/polymers. Areas of interest include: (1.) semiconductor and metal nanoparticles and metal/semiconductor nanocomposites; (2.) size quantization effects in semiconductor nanoparticles; (3.) surface modification and characterization including tunneling and force microscopies; (4.) photoinduced charge separation and interfacial charge transfer; (5.) dye-sensitization of semiconductors; (6.) photoelectrochemistry of nanostructured films; (7.) photocatalysis and environmental applications; (8.) nanostructured catalysts for fuel cells; (9.) metal/polymer nanocomposites and membranes; and (10.) nanostructured sensor surfaces and biological applications of nanomaterials.

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Abstracts should be submitted electronically via the ECS website, and questions and inquiries should be sent to the symposium organizers: **E. Traversa**, University of Rome Tor Vergata, e-mail: traversa@uniroma2.it; **J. Li**, NASA Ames Research Center, e-mail: jingli@mail.arc.nasa.gov; and **W. van Schalkwijk**, EnergyPlex Corp., e-mail: walter@energyplex.com.

B—BATTERIES, FUEL CELLS, AND ENERGY CONVERSION

B1

Battery/Energy Technology Joint General Session

Energy Technology / Battery

Papers are solicited on the fundamental and applied aspects of energy storage and energy conversion not covered by other symposia at this meeting. Of particular interest are new materials and designs, performance studies, and modeling of all types of batteries and fuel cells including aqueous, non-aqueous, polymer electrolyte, ionic liquids, and solid electrolyte systems.

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 November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically via the ECS website, and questions and inquiries should be sent to the symposium organizers: **R. Bugga**, Jet Propulsion Laboratory, e-mail: ratnakumar.v.bugga@jpl.nasa.gov; and **S. R. Narayanan**, Jet Propulsion Laboratory, e-mail: s.r.narayanan@jpl.nasa.gov.

B2

Battery Safety and Abuse Tolerance

Battery / Energy Technology

Safety of batteries and electrochemical capacitors has taken on more importance for battery manufacturers, government regulators as well as system integrators. Today's batteries have higher specific energy and higher power than those of a few years ago, which adds to the challenge of designing more abuse tolerant cells and battery packs. This symposium invites papers that describe all aspects of battery and electrochemical capacitor safety, including new materials and their reactivity with other cell components, decomposition reactions and elucidation of chemical mechanisms that generate heat and gas, the role of separators in abuse response, cell and battery pack design as it is related to abuse tolerance (including control circuitry) and standardized test procedures that describe abuse response of energy storage devices. In addition to studies that investigate the response to more standard abuse tests (e.g., overcharge or elevated temperature), studies that explore "field failure" events, where no causative abuse conditions can be documented, are also solicited. Finally, we encourage the submission of abstracts that describe the development of models or other formalisms that characterize the abuse response of individual cells and the propagation of failures between cells.

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Abstracts should be submitted electronically via the ECS website, and questions and inquiries should be sent to the symposium organizers: **D. H. Doughty**, Sandia National Labs, e-mail: dhough@sandia.gov; **J. Yamaki**, Kyushu University, e-mail: yamaki@cm.kyushu-u.ac.jp; **B. Barnett**, TiAx LLC, e-mail: barnett.b@tiaxllc.com; and **K. M. Abraham**, E-KEM Sciences, e-mail: kmabraham@comcast.net.

B3

Energy Efficient Technologies for Water Treatment

Energy Technology

Advancement in water treatment/purification technology offers solutions to the global water scarcity in the 21 century. Energy efficient water treatment technology is critically needed for the sustainable development of our society. Improvements in membrane technology, electrical and electrochemical driven processes and energy recovery techniques have led to new processes with less energy utilization. This symposium is to focus on the most recent advances in the energy efficient water purification processes and novel electrochemical water treatment technologies. Areas of interest include fundamental studies on photochemical and electrochemical reactions/

separation processes in aqueous solutions, new materials design and selection for components, especially studies on nano-materials for water treatment applications, novel electrochemical methods for waste water treatment, electrical and electrochemical disinfection methods, development of energy reduction techniques as well as system integration.

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Abstracts should be submitted electronically via the ECS website, and questions and inquiries should be sent to the symposium organizers: **C. Wei**, GE Global Research, e-mail: weic@crd.ge.com; and **W. Cai**, GE Global Research-Shanghai, e-mail: wei.cai@ge.com.

B4

Interfacial Electrochemistry and Chemistry in High Temperature Media

Energy Technology / Corrosion / The International Association for the Properties of Water and Steam

This symposium will focus on the latest advances and developments leading to understanding of interfacial phenomena in high temperature media, particularly the systems involving high temperature water and other solvents. The aim of the symposium is to provide deeper insight into chemical and electrochemical processes at all kinds of interfaces and to elucidate the significant effects of the interfacial processes on the properties and behavior of materials in high temperature aqueous environments. Of particular interest are the high temperature interfacial processes related to water cycles in current and next-generation fossil fuel and nuclear power plants, fuel cells and batteries, hydrogen production and storage, photovoltaics, hydrothermal/electrochemical synthesis of materials, corrosion and passivation of high-performance alloys, etc. Priority is given to areas of research connecting the interfacial chemical and electrochemical phenomena related to traditional and renewable energy generation systems and radioactive waste disposal. In particular, papers on the mechanisms of charge formation at and transfer through the interfaces, electrical double layer structure and dynamics, electrical conduction through interfaces and heterogeneous phases, interface adsorption/desorption processes, localized corrosion processes, etc. are welcome.

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Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **S. N. Lvov**, The Pennsylvania State University, e-mail: lvov@psu.edu; **S. R. Narayanan**, NASA-Jet Propulsion Laboratory, e-mail: s.r.narayanan@jpl.nasa.gov; **D. D. Macdonald**, The Pennsylvania State University, e-mail: ddm2@psu.edu; **R. B. Dooley**, Electric Power Research Institute, e-mail: rdooley@epri.com; **D. J. Wesolowski**, Oak Ridge National Laboratory, e-mail: wesolowskid@ornl.gov; and **S. Bruemmer**, Pacific Northwest Laboratory, e-mail: bruemmer@pnl.gov.

B5**Large-Scale Energy Storage Devices**

**Energy Technology / Industrial Electrochemistry
& Electrochemical Engineering**

Energy storage and electrochemical devices that can efficiently utilize the stored energy to generate 10 to 100 kilowatts of electrical power are desired to make power sources for airplanes, automobiles, and stationary residential and remote locations. This symposium provides a forum for recent advances in energy storage and converting stored energy to electrical power in compact efficient electrochemical devices. Papers are solicited in all areas of hydrogen storage, production and conversion to electrical power. Specific topics include but are not limited to: hydrogen storage technology, chemical routes to hydrogen production and solar driven water electrolysis. Novel or unconventional concepts for energy storage and conversion devices are encouraged including: materials and system designs for making and integrating compact, lightweight fuel cell stacks and reformers addressing issues, including: system weight, effect of environment (shock, vibration, temperature, etc.) on performance, refueling, shelf life, tank leakage rate, maintainability, ground support, etc.

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Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **D. Gervasio**, Arizona State University, e-mail: don.gervasio@asu.edu; **J. Szydlowski-Moore**, The Boeing Company, e-mail: joanna.a.szydlowski-moore@boeing.com; and **J. Fenton**, University of Central Florida, e-mail: jfenton@fsec.ucf.edu.

B6**Modeling of Electrochemical Power Sources**

**Battery / Energy Technology /
Physical and Analytical Electrochemistry / Fullerenes,
Nanotubes, and Carbon Nanostructures / Industrial
Electrochemistry & Electrochemical Engineering**

Modeling of electrochemical power sources is now a widespread activity and this symposium will strive to span its breadth and depth. The major focus will be battery applications and speakers should describe the significance of their work in terms of either designing or characterizing batteries. Specific areas of interest are: (1.) design techniques, (2.) performance simulation, (3.) abuse simulation, (4.) calendar and cycle life estimation, (5.) monitoring and control, (6.) materials modeling for physical property estimation, and (7.) model parameter estimation.

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Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **R. Spotnitz**, Battery Design LLC, e-mail: rspotnitz@batdesign.com; **V. Srinivasan**, Lawrence Berkeley National Laboratory, e-mail: vsrinivasan@lbl.gov; **J. Stockel**, U.S. Government, e-mail: joeskl@ucia.gov; and **A. Weber**, Lawrence Berkeley National Laboratory, e-mail: aweber@newman.cchem.berkeley.edu.

B7**Nanomaterials for Energy Conversion and Storage**

**Battery / Energy Technology / Physical and Analytical
Electrochemistry / Fullerenes, Nanotubes, and Carbon
Nanostructures**

Nanomaterials and nanotechnology offer tremendous potential to advance critically important energy storage and conversion devices that could replace conventional energy technologies and have a significant environmental impact. This symposium will address the challenges facing this new frontier with respect to: (1.) developing enabling and affordable materials and processes, and (2.) fabricating and demonstrating devices. Papers are solicited on both fundamental and applied aspects of nanomaterials and nanotechnology for energy conversion and storage. Specific areas to be covered include, but, are not limited to: (a.) lithium ion battery electrodes, (b.) double layer and supercapacitor electrodes and interfaces, (c.) electrocatalysts *e.g.*, proton exchange membrane, direct methanol, and solid oxide fuel cells, (d.) solid electrolyte materials, (e.) quantum effects and nanostructures in photovoltaics, and (f.) other related energy storage and conversion technologies.

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Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **G. Amatucci**, Rutgers, The State University of New Jersey, e-mail: gamatucci@rci.rutgers.edu; **A. Manthiram**, The University of Texas at Austin, e-mail: rmanth@mail.utexas.edu; **W. van Schalkwijk**, EnergyPlex Corporation, e-mail: walter@energyplex.com; **R. Mantz**, Army Research Office, e-mail: robert.a.mantz@us.army.mil; **C. Bock**, National research Council of Canada, e-mail: christina.bock@nrc.ca; and **V. Ramani**, Illinois Institute of Technology, e-mail: ramani@iit.edu.

B8**Next Generation Photovoltaics**

Energy Technology / Physical and Analytical Electrochemistry

Today's photovoltaic technologies for terrestrial applications are based on various forms of crystalline silicon. These technologies, the result of innovative, breakthrough research conducted 30 to 40 years ago, have enabled dozens of companies throughout the world to establish a 10-billion-dollar industry marketing primarily to non-grid-connected applications. Marketing in grid-connected applications, however, requires, substantial cost reductions, the Holy Grail of all PV R&D efforts. Thin film technologies, considered the next generation to crystalline silicon technologies, came into being some 25 years ago or more as another consequence of breakthrough, innovative R&D. These technologies, based on non-silicon or amorphous/polycrystalline silicon materials, are today's focus on tens of millions of dollars annually for their development.

There is no reason to believe that photovoltaic innovation has gone as far as it can go or that new viable PV technologies don't exist beyond the horizon of our present knowledge. Fundamental and exploratory research is needed to see what can be next. Further, breakthroughs can happen for silicon-based technologies, the thin film technologies considered successors to silicon, as well as in the identification of totally new PV concepts. Interestingly,

the PV patent literature is replete with innovative non-conventional PV technologies that weren't developed because supporting or enabling technologies did not exist. The problems then that prevented the demonstration of the concepts can perhaps be overcome today.

This symposium will focus on non-conventional technologies that have not been used in the PV industry but could be used commonly in the 21st century. Contributed publications of both fundamental and applied nature leading to maximum, cost-effective, utilization of solar energy for electric power generation are solicited. Some of the suggested general areas of interest are: (1.) new devices and structures using thin film materials such as thin film silicon, microcrystalline/amorphous silicon, polycrystalline metal chalcogenides and oxides, nanocrystalline materials, biomimetic concepts, organic materials, photoelectrochemical cells, dye-sensitized materials, or any combination of these materials and devices; (2.) materials and concepts suitable for very high efficiency epitaxial solar cells, including multijunction III-V materials and devices, lift-off techniques, solid-state epitaxy, or other concepts for incorporating single crystal thin film materials onto low-cost substrates; (3.) material synthesis and processing concepts; (4.) device modeling; (5.) efficient and low-cost manufacturing techniques; (6.) manufacturing processes and controls with special emphasis on recycling of materials and minimal waste; (7.) materials and device characterization including interface and contact studies; (8.) hybrid concepts such as PV-generated hydrogen, PV-powered electrochromics, or PV-storage combinations; and (9.) environmental issues such as recycling.

An issue of *ECS Transactions* is planned to be published "AFTER" the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **R. D. McConnell**, National Renewable Energy Laboratory (assigned to DOE HQ), e-mail: bob.mcconnell@ee.doe.gov; **B. Marsan**, Université du Québec à Montréal, e-mail: marsan.benoit@uqam.ca; **M. Tao**, University of Texas at Arlington, e-mail: mtao@uta.edu; and **K. Rajeshwar**, University of Texas at Arlington, e-mail: rajeshwar@uta.edu.

B9

Nickel-Metal Hydride Batteries

Battery / Physical and Analytical Electrochemistry

Nickel metal hydride batteries play a vital role in many commercial, industrial and military applications. Consequently, a symposium to present and discuss the most recent technology is timely. Papers are solicited on both fundamental and applied aspects of Nickel Metal Hydride (NMH) cells and batteries. Specific aspects to be covered, but not limited to (1.) alternate and traditional anode and cathode active material design, preparation, characterization and performance; (2.) electrode processing and cell design; (3.) studies of the interfaces; (4.) design and characterization of the electrolyte; (5.) materials and cell modeling; (6.) performance, safety, and failure mechanisms; and (7.) charging technology.

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Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **D. Scherson**, Case Western Reserve University, e-mail: a_dxs16@po.cwru.edu; and **C. Richard Walk**, BAE Systems Applied Technologies, e-mail: dick.walk@gmail.com.

B10

Proton Exchange Membrane Fuel Cells (PEMFC 7)

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

This international symposium is devoted to all aspects of research, development, and engineering of proton exchange membrane (PEM) fuel cells and stacks, as well as direct methanol fuel cells or other low-temperature direct-fuel cells. The intention is to bring together the international community working on the subject and to enable effective interactions between research and engineering communities. The symposium is coordinated by means of three different sections (A, B, and C) as outlined below.

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In order to encourage active participation of new and talented researchers in the field, we anticipate awarding **Travel Grants** of at least \$500 in support of outstanding abstract submissions made by **graduate students** and **postdoctoral fellows** to the symposium. Awards will be made based on originality of the work and importance to the field. If you would like to apply for the travel grant, please submit your abstract, your resume, and your publication list to the organizers listed for your section. To be eligible for a student travel award, you must submit a manuscript for the transactions. In addition, we are planning to award a **prize** for the best presentation within the symposium by a graduate student or postdoctoral fellow. If you would like to be considered for this award, please send an e-mail to S. Cleghorn indicating your interest and student/postdoc status. Again, submission of a manuscript is required.

Abstracts for oral and poster contributions must be submitted to the symposium via the ECS website.

B10/Section A: Durability

Organizers: T. Fuller, H. A. Gasteiger, and S. Cleghorn

Presentations that discuss: (1.) fundamental degradation mechanisms of fuel-cell materials (e.g., materials corrosion, decomposition, and contamination); (2.) the durability of complex fuel cell components (e.g., voltage degradation mechanisms in electrolyte/electrode-assemblies); (3.) the impact of transient operating conditions on fuel cell durability/reliability; and (4.) the reliability of fuel cell systems for power generation (e.g., maintenance, and reliability of ancillary components).

Section A Organizers: **T. Fuller**, Georgia Institute of Technology, e-mail: tom.fuller@gtri.gatech.edu; **H. A. Gasteiger**, General Motors Corp., e-mail: hubert.gasteiger@gm.com; and **S. Cleghorn**, W. L. Gore & Associates, Inc., e-mail: scelghorn@wlgore.com.

B10/Section B: Fuel Cell Systems, Cell Stack, and Component Hardware

Organizers: V. Ramani, T. Zhao, and T. V. Nguyen

Presentations that discuss: (1.) new cell and stack structures, including new types of bipolar plates and flow fields; (2.) novel gas diffusion medium substrates and micro-porous layer designs; (3.) modeling and diagnostic methods to characterize mass- and heat-transport related phenomena (e.g., water flooding); and (4.) design and specifics of complete power systems in the context of transportation and stationary power generation applications as well as for micro-fuel cell systems.

Section B Organizers: **V. Ramani**, Illinois Institute of Technology, e-mail: ramani@iit.edu; **T. Zhao**, Hong Kong University of Science & Technology, e-mail: metzhao@ust.hk; **T. V. Nguyen**, Univ. of Kansas, e-mail: cptvn@ku.edu; and **A. Haug**, UTC Fuel Cells, e-mail: andrew.haug@utcpower.com.

B10/Section C: New Materials and Electrode Processes

Organizers: C. Bock, C. Lamy, K. Ota, and P. Pintauro

Presentations that discuss: (1.) electrocatalysis of fuel cell reactions, particularly at the catalyst/ionomer interface and methods to increase anode and cathode performance; (2.) computational approaches and experiments with idealized model surfaces used toward the design of novel catalysts and/or catalyst supports; (3.) ionomeric membrane thermodynamics and transport characteristics; and (4.) new ionomeric membrane development, especially for high temperature operation as well as improved resistance to fuel crossover.

Section C Organizers: **C. Bock**, National Research Council of Canada, e-mail: christina.bock@nrc.ca; **C. Lamy**, Université de Poitiers, CNRS, e-mail: claude.lamy@univ-poitiers.fr; **K. Ota**, Yokohama National University, e-mail: ken-ota@ynu.ac.jp; and **P. Pintauro**, Case Western Reserve University, e-mail: pnp3@case.edu.

B11 Rechargeable Lithium and Lithium Ion Batteries

Battery / Energy Technology

This symposium is focused upon oral and poster presentations on both the fundamental and applied aspects of rechargeable lithium metal and lithium-ion batteries. Papers are solicited in a number of technical areas, including: (1.) anode design, characterization, and performance; (2.) cathode design, characterization, and performance; (3.) research involving electrolyte development and characterization; (4.) electrode interfacial studies and diagnostic techniques; (5.) cell modeling; (6.) elucidation of failure modes and mechanisms; and (7.) performance and safety aspects of cells and batteries.

Instructions for preparing the manuscript can be found on the ECS website. Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries to the symposium organizers.

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M. C. Smart, Jet Propulsion Lab., e-mail: Marshall.C.Smart@jpl.nasa.gov; **R. Bugga**, Jet Propulsion Lab., e-mail: Ratnakumar.V.Bugga-103068@jpl.nasa.gov; and **K. M. Abraham**, E-KEM Sciences, e-mail: kmabraham@comcast.net.

B12 Solid-State Ionic Devices 5

High Temperature Materials / Sensor / Energy Technology / Physical and Analytical Electrochemistry

Solid-state electrochemical devices, such as batteries, fuel cells, membranes, and sensors, are critical components of technologically advanced societies in the 21st Century and beyond. The development of these devices involves common research themes such as ion transport, interfacial phenomena, and device design and performance, regardless of the class of materials or whether the solid state is amorphous or crystalline. The intent of this international symposia series is to provide a forum for recent advances in solid-state ion conducting materials and the design, fabrication, and performance of devices that utilize them.

For this, the 5th in the series of international symposia, emphasis will be given to electrocatalytic phenomena and effect on electrode performance. Papers on interfacial and electrocatalytic phenomena, mechanistic studies of activity and selectivity that incorporate heterogeneous catalysis techniques, spectroscopic characterization of adsorbed species, and the effect of electrode microstructure are particularly encouraged.

In addition, papers are solicited in such topics as modeling and characterization of defect equilibria, ionic and electronic transport; novel synthesis and processing of thin films, membranes, and nanostructured materials or devices; the effect of nanostructures on ionic transport and catalytic activity; permeation studies; materials characterization and crystallographic investigations; extreme engineering applications (e.g., aerospace), and the design, and performance of solid state ionic devices: fuel cells, thermal energy converters, solid-state batteries and microbatteries, chemical sensors, supercapacitors, membranes, and electrochromic devices.

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Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **E. D. Wachsman**, University of Florida, e-mail: ewach@mse.ufl.edu; **F. H. Garzon**, Los Alamos National Laboratory, e-mail: garzon@lanl.gov; **E. Traversa**, University of Rome "Tor Vergata," e-mail: traversa@uniroma2.it; **R. Mukundan**, Los Alamos National Laboratory, e-mail: mukundan@lanl.gov; and **A. Manivannan**, U.S. DOE National Energy Technology Lab, e-mail: manivana@netl.doe.gov.

C—BIOMEDICAL APPLICATIONS AND ORGANIC ELECTROCHEMISTRY

C1 Surface Treatments for Biomedical Applications

Electrodeposition / Corrosion

Understanding and manipulating the physical and chemical properties of various surfaces is very important for a variety of applications in the biomedical field. Applications may include various implants, dressings for wound healing and different skin diseases, surfaces for immunodiagnostic devices, patches for a continuous drug release and surfaces used for the prevention of biofilm formation or corrosion inhibition. The aim of this symposium is to bring together scientists, researchers and engineers with a multidisciplinary

approach of the treatments of surfaces which may increase our knowledge related to various biomedical applications. Treatments of interest include, but are not limited to: all methods of electrodeposition of thin films of various metals (Ag, Au, Cu, Pd, Pt etc.), oxides, polymers or salts which are used for implants and devices for wound healing applications, treatment of various skin diseases or the inhibition of corrosion processes; production of composite coatings (metallic, polymeric or oxide matrices containing biologically active ingredients) via electrodeposition, electroless deposition or other available methods which may be useful in devices for a continuous drug release, implants, catheters or surfaces for biofilm prevention; production of thin films via electrochemical or chemical oxidation which may have unusual properties (antimicrobial, adsorption, high surface area to allow a continued release of desired chemicals or biologicals etc.) and as such may be useful in the production of various biomedical devices or surfaces for the prevention of biofilm formation or corrosion. Substrates of interests may include metals, textile materials (natural or synthetic), foams, polymers, ceramics etc. Devices of interest(s) are wound dressings, catheters, implants and devices for the continuous drug release, surgical instruments etc. Papers dealing with the behavior both *in vitro* and *in vivo* are very much encouraged.

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Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **S. Djokic**, Elchem Consulting Ltd., e-mail: sdjokic@telus.net; and **D. C. Hansen**, University of Dayton Research Institute, e-mail: douglas.hansen@udri.udayton.edu.

D—CORROSION, PASSIVATION, AND ANODIC FILMS

D1

Corrosion General Session

Corrosion

Presentations concerning all aspects of corrosion and associated phenomena in liquid and gaseous phases not covered by topic areas of other specialized Corrosion Division symposia at this meeting 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 oral presentations.

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Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **A. Davenport**, University of Birmingham, e-mail: a.davenport@bham.ac.uk.

D2

High Resolution Characterization of Corrosion Processes

Corrosion

This symposium will provide a forum for all studies of corrosion that are highly resolved in space and/or time and applied with the aim of elucidating kinetics and mechanisms. Particular interest will be directed toward techniques providing fresh insight into the localization and/or time-dependence of corrosion phenomena as they occur on metal surfaces in an uncoated or coated state in the presence or absence of corrosion inhibitors. Techniques of interest include, but are not limited to: x-ray synchrotron spectroscopy and tomography, in-situ optical imaging/microscopy, laser scanning microscopy, confocal microscopy, acoustic (ultrasound) microscopy, magnetic imaging techniques, the scanning Kelvin probe (SKP), Kelvin force microscopy (KFM), atomic force microscopy (AFM), scanning electrochemical microscopy (SECM), the scanning reference electrode technique (SRET), the scanning vibrating electrode technique (SVET) and localized electrochemical impedance spectroscopy (LEIS). The organizers encourage papers dealing with: metastable and stable pitting, crevice corrosion, differential aeration effects, intergranular corrosion, dealloying, re-plating, galvanic corrosion, erosion corrosion, stress-corrosion cracking, and corrosion fatigue. Also, papers dealing with corrosion-driven processes affecting coated metals such as cathodic disbondment, anodic undercutting and filiform corrosion are of interest. The organizers extend the call to those who wish to report high resolution studies of etching, nanostructure evolution and MEM (microelectromechanical machine) development.

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Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **H. N. McMurray**, University of Wales Swansea, e-mail: h.n.mcmurray@swan.ac.uk; **G. S. Frankel**, Ohio State University, e-mail: frankel.10@osu.edu; **H. Masuda**, National Institute for Materials Science, e-mail: masuda.hiroyuki@nims.go.jp; **D. C. Hansen**, University of Dayton Research Institute, e-mail: Douglas.Hansen@udri.udayton.edu; and **A. Davenport**, The University of Birmingham, e-mail: A.Davenport@bham.ac.uk.

D3

Light Alloys 3

Corrosion

This is the third in a successful series of symposia covering all aspects of the corrosion and surface treatment of light alloys. Alloys based on aluminum, magnesium, and titanium all offer considerable environmental benefits from weight saving in a wide range of applications such as those related to transport in aerospace, marine, and automotive sectors, but this must be achieved without using surface treatments involving environmentally-hazardous chemicals. There is also increasing interest in the use of magnesium and titanium in niche applications such as biomedical devices. Papers are invited that address these issues through the development of new corrosion-resistant alloys, improved surface finishing technologies including conversion coating and anodizing, fabrication methods including powder and laser-based approaches, or joining technologies including welding and adhesive bonding. Underpinning all of these technologies is a mechanistic

understanding of corrosion and passivation processes at both the microstructural and atomistic scale, which is advancing rapidly owing to major developments in structural and electrochemical characterization methods and corrosion modeling.

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Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **A. J. Davenport**, University of Birmingham, e-mail: a.davenport@bham.ac.uk; **S. Virtanen**, Univ. of Erlangen-Nuremberg, e-mail: virtanen@www.uni-erlangen.de; **B. Shaw**, Penn State University, e-mail: bas13@psu.edu; **R. Buchheit**, The Ohio State University, e-mail buchheit.8@osu.edu; and **N. Missert**, Sandia National Laboratories, e-mail namisse@sandia.gov.

D4

Modeling and Simulation of Dissolution and Corrosion Processes

Corrosion / Industrial Electrochemistry & Electrochemical Engineering

Corrosion modeling and simulation have advanced considerably, particularly in the past decade, in terms of both the fidelity of the models and the coverage of the range of size scales. Engineering scale models have been constructed that combine inputs of measurable parameters with an abstracted representation of smaller scales to predict future performance. Continuum level models have started to move from being mostly qualitative to being able to guide material design. Nanoscale models have benefited greatly from the increase in available computational power and the development of frameworks to begin to probe reaction rates and surface morphology development. Atomistic scale models of surfaces heretofore used only for vapor phase reactions have been extended to the case of metals immersed in solution and can simulate the effects of applied potential, providing a means to calculate the structure and energetics of the metal/solution interface from first principles. Improved experimental tools for both input data generation for the models and validation of the outputs of the models have also been developed. This symposium will provide a forum for the presentation and discussion of the state-of-the-art in the modeling of corrosion and dissolution processes.

Original papers of interest include, but are not restricted to, the following: (1.) processes and forms of corrosion: general corrosion, pitting, crevice corrosion, intergranular corrosion, environment-assisted cracking, coating failure; (2.) manufacturing processes using dissolution: etching of metals, alloys, semiconductors, conducting polymers; (3.) experimental validation of models; and (4.) new modeling and simulation methods.

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Organizers: **R. G. Kelly**, University of Virginia, e-mail: rgkelly@virginia.edu; **J. P. Meyers**, University of Texas at Austin, e-mail: jeremypmeyers@mail.utexas.edu; **B. Tribollet**, Université P. et M. Curie, e-mail: bt@ccr.jussieu.fr; and **F. J. Presuel-Moreno**, Dept. of Ocean Engineering, e-mail: fpreseul@fau.edu.

E—DIELECTRIC AND SEMICONDUCTOR MATERIALS, DEVICES, AND PROCESSING

E1

Atomic Layer Deposition Applications 3

Dielectric Science & Technology

The continuously expanding realm of Atomic Layer Deposition (ALD) applications is the symposium focus. ALD can enable the precise deposition of ultra-thin, highly conformal coatings over complex 3D topography, with controlled composition and properties. Following two successful years, this symposium is well on its way to becoming a forum for sharing of cutting edge research in the various areas where ALD is used. Emerging and non-mainstream ALD applications are also of special interest to this symposium. Contributions are solicited in the following areas: (1.) volatile and non volatile memory applications: integration of ALD high-k oxides and metal electrodes, extendibility, Flash, MIM, MIS, RF capacitors, etc.; (2.) interconnects and contacts: integration of ALD films with Cu and low-k materials; (3.) productivity enhancement of ALD equipment and processes; (4.) precursor and delivery systems development for ALD; (5.) advanced and novel integration schemes of ALD films; (6.) ALD for optical and photonic applications; (7.) coating of nanoporous materials by ALD; (8.) selective area ALD for patterning of nanoscale films; and (9.) applications for ALD in other areas, such as disk drives, MEMS, nanotechnology, deposition on polymers, etc.

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 July 2, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted via the ECS website. Symposium Organizers: **A. Londergan**, Qualcomm MEMS Technologies, e-mail: alondergan@qualcomm.com; **O. van der Straten**, IBM Research, e-mail: ovander@us.ibm.com; **S. De Gendt**, High-k and Metal Gate, IMEC, e-mail: Stefan.Degendt@imec.be; **J. Elam**, Energy Systems Division, Argonne National Laboratory, e-mail: jelam@anl.gov; **S. Bent**, Stanford University, e-mail: bent@stanford.edu; and **S. B. Kang**, Semiconductor R&D Center, Samsung Electronics, e-mail: sbkangh@samsung.com.

E2

Cleaning and Surface Conditioning Technology in Semiconductor Device Manufacturing 10

Electronics and Photonics

This symposium has been held biannually since 1989. It will cover a wide range of topics related to the removal of contaminants from and conditioning of Si/SOI, SiC, Ge, SiGe, and III-V semiconductor surfaces; cleaning media, including non-aqueous cleaning methods and tools; front- and back-end cleaning operations; integrated cleaning; cleaning of MEMS; photomasks (reticles); porous low-k dielectrics; post-CMP cleaning; wafer bevel cleaning/polishing; characterization, evaluation, and monitoring of cleaning; correlation with device performance; cleaning of equipment and storage/handling hardware; as well as other issues within the broadly understood scope of this symposium, including those involved in large-area electronics and photonics, both non-organic and organic TFT technology, compound semiconductor device processing, nanowires and nanotubes cleaning, and surface conditioning related aspects of SEM processing.

A hard-cover issue of *ECS Transactions* is planned to be available "AT" the meeting. To make this possible, abstracts must be submitted electronically to ECS by March 30, 2007. Please check www.electrochem.org for abstract format and submission procedures. Following positive evaluation, authors will be requested to submit electronically, directly to ECS, a full-lengths camera-ready manuscript by June 15, 2007. Details regarding submission will be provided on the ECS website. All manuscripts will be submitted online, and must be in either MS Word or PDF format. Only papers submitted the *ECS Transactions* volume and accepted for publication following a review process will be included in the program and scheduled for presentation during the symposium.

Additional information regarding this symposium can be obtained from the following co-organizers: **J. Ruzyllo**, Penn State University, e-mail: jruzylo@psu.edu; **T. Hattori**, Sony Corporation, e-mail: takeshi.hattori@jp.sony.com; **R. E. Novak**, Akrion, Inc., e-mail: richnovak@aol.com; **P. Mertens**, IMEC vzw, E-mail: mertensp@imec.be; and **P. Besson**, CEA-LETI, E-mail: pascal.besson@cea.fr.

E3

Analytical and Diagnostic Techniques for Semiconductor Materials, Devices, and Processes

Electronics and Photonics / Dielectric Science & Technology

Diagnostic characterization techniques for semiconductor materials, devices and device processing will be addressed at this symposium. It will cover new techniques as well as advances in routine analytical technology applied to semiconductor process development and manufacture. Presentations are solicited on: (1.) emerging diagnostic techniques and illustrations of their strengths and weaknesses; (2.) challenges in metrology for nanoscale devices and nanostructures, including dimensional and electrical metrology, as well as atomic imaging/spectroscopy tool development and applications; (3.) the application of standard methods of monitoring to specific problems in materials growth, processing, or device failure; (4.) variations and improvements in routine diagnostic methods now employed on the process line; (5.) issues related to state-of-the art IC production, such as time and cost of measurements, measurement-induced device damage, technique modifications needed for sub-micron characterization, comparisons of techniques, optimum combinations of metrology, defect and yield correlations, and measurement needs for next generation manufacturing; and (6.) on-line process media analyses, integrated metrology, feedback, and feed-forward metrology data management. Sessions will be organized around current and coherent topics in order to attract professionals with complementary interests and to provide a venue to explore solutions to specific problems.

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 July 2, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format. The symposium plans to publish the papers from this symposium in conjunction with the ALTECH 07 symposium, Analytical Techniques for Semiconductor Materials and Process Characterization V.

Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries can be directed to the organizers: **A. Diebold**, Sematech, e-mail: alain.diebold@sematech.org; **L. Fabry**, Wacker Chemie, e-mail: laszlo.fabry@wacker.com; **R. Hockett**, EAG Labs.,

e-mail: dhockett@eaglabs.com; **D. Schroder**, Arizona State University, e-mail: schroder@asu.edu; **H. Shimizu**, Nihon University, e-mail: shimizuh@ee.ce.nihon-u.ac.jp.

E4

High Dielectric Constant Materials and Gate Stacks 5

Dielectric Science and Technology / Electronics and Photonics

Papers are solicited in all areas related to advanced gate stacks for CMOS and memory applications in sub-45 nm feature size integrated circuits. The symposium may hold joint sessions with other closely related symposia (e.g. E1/Atomic Layer Deposition Applications III). The following topics are included: (1.) substrates: higher mobility semiconductors such as strained Si, (110) and (111) Si, SiGe, Ge, GaAs, and other III-V compounds, GeOI, GaAs-on-insulator, and SOI; (2.) high k gate dielectric materials and processing: trends in high k gate dielectric technologies for 45 nm and beyond, novel high k materials, advanced oxynitrides for 45 nm and beyond, high k gate dielectric growth techniques, high k gate dielectric deposition methods, and advanced precursors for CVD; (3.) gate electrode materials and processing: trends in gate electrode technologies for 45 nm and beyond, poly-Si, silicided, and metal gate electrodes, band-edge and midgap work-function materials, and gate electrode deposition methods; (4.) high k gate dielectric interfaces: silicon/high-k and high-k/gate-electrode interfaces, oxygen diffusion and mechanisms of interface layer formation, and interface preparation, passivation, engineering, and control; (5.) advanced gate stack reliability: identification of main reliability problems in low voltage applications and new reliability models, bias temperature instability, metallic cross-contamination across layers, mechanisms of mobility degradation, and thermal stability of new materials; (6.) high k gate dielectric characterization and methodologies: advanced physical, chemical, and electrical characterization of gate stacks, accurate determination of dielectric capacitance, trap parameter extraction, non-contact electrical characterization, work-function extraction methodologies, and determination of tunneling electron/hole mass; and (7.) DRAM and non-volatile memory materials: trends in high k DRAM capacitor technologies, electrode/dielectric chemical interactions, thermal stability of structures, and non-volatile and novel memory applications.

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Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **S. Kar**, Indian Institute of Technology, e-mail: skar@iitk.ac.in; **S. De Gendt**, High-k and Metal Gates, IMEC e-mail: degendt@imec.be; **M. Houssa**, High-k and Metal Gates, IMEC vzw, e-mail: housa@imec.be; **D. Landheer**, Surfaces and Interfaces Group, Institute for Microstructural Sciences, National Research Council, e-mail: dolf.landheer@nrc.ca; **D. Misra**, New Jersey Institute of Technology, e-mail: dmisra@njit.edu; and **H. Iwai**, Frontier Collaborative Research Center, e-mail: iwai@ae.titech.ac.jp.

E5**Nanocrystal Embedded Dielectrics for Electronic and Photonic Devices****Electronics and Photonics / Dielectric Science & Technology**

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 electro-luminescence, 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 via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **P. Mascher**, McMaster University, e-mail: mascher@mcmaster.ca; and **P. Joshi**, LCD Process Technology Laboratory, Sharp Laboratories of America, Inc., e-mail: pjoshi@sharplabs.com.

E6**Nanoscale One-Dimensional Electronic and Photonic Devices****Electronics and Photonics / Sensor**

This first NODEPD symposium will address the most recent developments in nanoscale electronic and photonic devices, encompassing one dimensional novel devices, processing, device fabrication, reliability, and other related topics. Papers on both practical issues and fundamental studies are solicited. The symposium will consist of both invited and contributed papers. Abstracts have to be submitted at the ECS website due on or before May 26, 2007.

A hard-cover *ECS Transactions* issue, jointly published with Processes at the Semiconductor Solution Interface II symposium, 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 July 2, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted via the ECS website. Comments and inquiries about the symposium may be sent to the organizers: **L.-J. Chou**, Tsing-Hua University, e-mail: ljchou@mx.nthu.edu.tw; website: www.mse.nthu.edu.tw/www/index.html; **F. Ren**, University of Florida, e-mail: ren@che.ufl.edu; website: www.che.ufl.edu/faculty/Ren/index.html; **Z. L. Wang**, Georgia Tech, e-mail: zhong.wang@mse.gatech.edu, website: www.nanoscience.gatech.edu/zlwang/wang.html; **Y. Bando**, National Institute for Material Science (NIMS), e-mail: bando.yoshio@nims.go.jp; and **S. Roth**, Max-Planck-Institut für Festkörperforschung Heisenbergstr, website: www.fkf.mpg.de/klitzing/group_members/list_member.php?member=Siegmard%20Roth.

E7**Organic Semiconductor Materials and Devices****Electronics and Photonics / Dielectric Science and Technology / Luminescence & Display Materials**

This first symposium on this topic will cover a wide range of topics related to broadly understood science and technology of organic semiconductor materials, processes, and devices. The list of topics of interest includes, but is not limited to, the following: (1.) chemistry of organic semiconductors and its impact on material and device characteristics; small molecule and polymer organic semiconductors; (2.) physical phenomena underlying operation of organic semiconductor devices; (3.) deposition methods, PVD, solution processing, others; (4.) substrates: conductive and non-conductive, mechanically rigid and flexible; (5.) electronic devices, TFTs, ohmic contacts, dielectric-organic semiconductor material systems, charge transport, modeling; (6.) photonic devices, OLEDs, solar cells; (7.) display and lighting applications; (8.) patterning of organic semiconductors to create desired device geometries; (9.) large area organic semiconductor electronics and photonics, roll-to-roll processing; and (10.) reliability, stability, reproducibility of device characteristics.

An issue of *ECS Transactions* is planned to be published "AFTER" the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

To be considered for inclusion into the symposium, program abstracts must be submitted electronically via the ECS website, and questions and comments may be sent to the symposium organizers: **J. Deen**, McMaster University, e-mail: jamal@mcmaster.ca; **J. Ruzyllo**, Penn State University, e-mail: jruzylo@psu.edu; and **H. Klauk**, Max Planck Institute for Solid State Research, e-mail: H.Klauk@fkf.mpg.de.

E8**State-of-the-Art Program on Compound Semiconductors (SOTAPOCS 47)****Electronics and Photonics**

The SOTAPOCS 47 symposium will address 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.

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 July 2, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format. The symposium will consist of both invited and contributed papers.

Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **J. Wang**, Northrop Grumman Space Technologies, e-mail: jennifer.wang@ngc.com; **J. Kim**, Korea University e-mail: jhkim@prosys.korea.ac.kr; **H.**

E9

ULSI Process Integration 5

Electronics and Photonics

The fifth symposium on ULSI Process Integration will provide a forum for reviewing and discussing all aspects of process integration. Contributed papers are solicited in the following areas: (1.) trends in nanoscaled technologies, 65 nm and beyond on DRAM, SRAM, flash memory, high density logic/low power, RF, mixed analog/digital, high voltage, process integration yield; (2.) CMP chemistries, low-k process integration, gate stacks, metal gates, rapid thermal processing integration, silicides; (3.) gate dielectrics (ultra-thin, high-k) and dual gates, stacks (barriers) electrode/dielectrics for memory capacitors and transistors, source-drain and channel processing, rapid, novel isolation schemes, ultra shallow junction, plasma processing aspects, sub 45 nm transistor process/device integration issues; (4.) multilevel integrated structures, copper interconnects and barriers, air-gap structures, metal fill technologies, optical interconnects, alternative metallization schemes; and (5.) novel memory elements, emerging devices, carbon nanotubes, novel materials, vertical and 3D integration, alternative high mobility substrates (SOI, sSi, SiGe, GeOI, etc.), strain engineering issues, and hybrid III-V integration.

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 July 2, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format. Instructions for preparing the manuscript will be sent out by the symposium organizers after official notification of acceptance.

Detailed information about the symposium including invited speakers, sponsors, and manuscript preparation can be found at the symposium website: <http://www.ece.ncsu.edu/research/ecsfep/>.

Abstracts should be submitted via the ECS website, and comments and inquiries about the symposium may be sent to the organizers: C. Claeys, IMEC, e-mail: claeys@imec.be; H. Iwai, Tokyo Institute of Technology, e-mail: h.iwai@ieee.org; M. Tao, University of Texas at Arlington, e-mail: mtao@uta.edu; and J. Murota, Tohoku University, e-mail: murota@riec.tohoku.ac.jp.

E10

Wide-Bandgap Semiconductor Materials & Devices 8

Electronics and Photonics / Luminescence & Display Materials

This symposium will focus on issues pertinent to development and application of wide bandgap semiconductor materials and devices. The following six technical areas are of particular interest: (1.) emitters: light emitting diodes, laser diodes, and displays; (2.) detectors: including solar cells and avalanche photodiodes; (3.) alternate substrates: including GaN, AlN, and ZnO; (4.) material characterization: synthesis, defect structure and luminescence; (5.) high temperature, high power, and high frequency electronics; and (6.) sensor applications. The goal of this symposium is to bring together the wide bandgap crystal growth, device processing, circuit design, and applications communities to review current issues in wide-bandgap semiconductors. As usual, this symposium will be held in conjunction with the State of the Art Program on Compound Semiconductors (SOTAPOCS), and will consist of both invited and contributed papers and posters.

A joint *ECS Transactions* (ECST) issue will be published with SOTAPOCS. 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 July 2, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: E. Stokes, University of North Carolina at Charlotte, e-mail: ebstokes@uncc.edu; J. Bardwell, National Research Council, e-mail: jennifer.bardwell@nrc.ca; J. Brown, RF Micro Devices, e-mail: jbrown@rfmd.com; G. Hunter, NASA Glenn Research Center, e-mail: ghunter@grc.nasa.gov; K. Mishra, Osram Sylvania Central Research, e-mail: kailash.mishra@sylvania.com and P. Shen, AMSRL-SE-EM, e-mail: pshen@arl.army.mil.

F—ELECTROCHEMICAL / CHEMICAL DEPOSITION AND ETCHING

F1

Current Trends in Electrodeposition (an invitational symposium)

Electrodeposition

The symposium will provide a forum for the presentation of new and exciting research of interest to the electrodeposition community. This will be a single half-day session comprised of 40-minute invited lectures. Our intent is to highlight the most recent and perhaps controversial research topics and to promote discussion in these areas.

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 November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Suggestions and inquiries should be sent to the symposium organizer: J. L. Stickney, University of Georgia, e-mail: Stickney@chem.uga.edu.

F2

Electrodeposition of Nanoengineered Materials and Alloys 2

Electrodeposition

A variety of nano-architectures, ranging from nanoparticles to nanowires, exhibit many novel quantum phenomena. These phenomena may have potential technological applications including electronics, optoelectronics, spintronics, and chemical and biological sensors. In recent times, one of the most powerful and extensively used methods for synthesizing such structures relies on electrodeposition. Electrodeposition is a facile method to synthesize a variety of nanoengineered materials including metals, alloys, metal oxides, semiconductors and conducting polymers. In addition to nano-architectures, various nanocrystalline materials with superior properties including high mechanical strength and high electrical conductivity can also be electrodeposited.

In this symposium, we seek to bring together recent work in which such nanoengineered materials have been created in an attempt to understand how nanostructure growth can be controlled, how size and shape can be specified for nanostructures, how nanostructure size and shape dispersion can be limited, and how nanostructures prepared by electrodeposition can be manipulated to create useful nanodevices.

An issue of *ECS Transactions* is planned to be published "AFTER" the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **N. V. Myung**, University of California-Riverside, e-mail: myung@engr.ucr.edu; **R. M. Penner**, University of California-Irvine, e-mail: rmpenner@uci.edu; **N. Tao**, Arizona State University, e-mail: Nongjian.Tao@asu.edu; **E. J. Podlaha-Murphy**, Louisiana State University, e-mail: Podlaha@lsu.edu; **G. Zangari**, University of Virginia, e-mail: gz3e@virginia.edu.; **J. Mallett**, NIST Gaithersburg, e-mail: jon.mallett@nist.gov; and **J. Talbot**, University of California, e-mail: jtalbot@ucsd.edu.

F3

Stress Related Phenomena in Electrochemical Systems

Electrodeposition / Corrosion

The symposium will provide a forum for the presentation of original research concerned with stress effects on electrochemical processes. Fundamental and applied papers are solicited on all aspects of stress effects on general electrochemical, electrodeposition and corrosion phenomena including but not limited to surface stress at the electrode/electrolyte interface, growth stress in thin films, strain-induced nucleation and self-assembly, stress or strain effects on general, localized, and environment assisted cracking phenomena, stresses associated with valve metal anodization and template formation, passive film rupture-repassivation, as well as stress-strain effects on corrosion when controlled by particle/matrix interactions. Special interest will be placed on stress effects on corrosion modes/morphology and transitions in corrosion modes upon application of stress.

Topics of interest include: (1.) in situ and ex situ experimental methods, e.g., wafer curvature, x-ray diffraction; (2.) surface stress, e.g., electrocapillarity, adsorbate-induced surface stress, surface reconstruction; (3.) growth stress in thin films, e.g., epitaxial growth and misfit-induced stress, capillarity, nuclei coalescence, grain growth, role of defects and impurities; (4.) strain-induced island growth/dissolution, (5.) electrochemical insertion and intercalation reactions; (6.) stress development in films formed by physical/chemical vapor deposition; (7.) stress effects on charge transfer and electrocatalysis; and (8.) stress-strain effects on all forms of corrosion as well as transitions in corrosion morphology upon application of stress.

An issue of *ECS Transactions* is planned to be published "AFTER" the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **G. R. Stafford**, National Institute of Standards and Technology, e-mail: gery.stafford@nist.gov; and **J. R. Scully**, University of Virginia, e-mail: jrs8d@virginia.edu.

G—ELECTROCHEMICAL SYNTHESIS AND ENGINEERING

G1

Leadership and Entrepreneurship in Electrochemical Engineering: A Tutorial Symposium

Industrial Electrochemistry & 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.

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 November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format. These papers will be reviewed by the symposium organizers.

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

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 November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts, suggestions and inquiries should be submitted electronically via the ECS website, and to the symposium organizer: **H. De Long**, AFOSR/NL, e-mail: hugh.delong@afosr.af.mil.

12

Electrochemical Scanning Probe Microscopy: From Theory to Real-World Applications

Physical and Analytical Electrochemistry / Sensor

Electrochemical scanning probe techniques and in particular Scanning Electrochemical Microscopy (SECM) along with novel hybrid techniques have matured from a fundamental developing stage into versatile systems gaining spatially and temporally resolved information of important processes ranging from applications in cell biology to corrosion science and fuel cell development. SECM plays an ambiguous role in understanding a large variety of heterogeneous reactions at solid-liquid and liquid/liquid interface. Hence, within the last decade significant developments in electrochemical scanning probe techniques could provide insight in fundamental processes including "hot topics" such as fuel cell research and life cell imaging.

This symposium is intended to bring together scientists working at the forefront of chemistry, physics, biology and materials science to focus on recent developments and new application of electrochemical scanning probe techniques.

Topics of special interest include: (1.) new instrumental developments; (2.) microelectrochemistry in nano- and microtechnology; (3.) corrosion science; (4.) biomedical and life science applications; (5.) imaging sensors; (6.) novel modi in electrochemical imaging; (7.) theory and mathematical modeling of SECM experiments; and (8.) nano- and micro-structuring of surfaces.

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 November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **W. Schuhmann**, Ruhr-Universität Bochum; e-mail: Wolfgang.Schuhmann@ruhr-uni-bochum.de; and **C. Kranz**, Georgia Institute of Technology, e-mail: Christine.kranz@chemistry.gatech.edu.

13

Hyphenated Methods in Electroanalytical Chemistry

Physical and Analytical Electrochemistry

The focus of this symposium is on the recent advances brought by hyphenated techniques involving electroanalytical chemistry. It will include both invited and contributed papers on both fundamental and applied topics. The following areas are of particular interest: electrochemical methods coupled with spectroscopic techniques which are making new contributions in materials science in materials characterization through imaging including that of catalytic surfaces; electrochemical methods coupled with mass spectrometry allowing characterization of redox processes in real time including *in situ* characterization of catalytic surfaces and biological reactivity; additionally, in bioanalytical chemistry, electrochemical methods coupled with microcolumn separations are advancing characterization of biological materials at the cellular level and *in vivo*; and most recently electrochemical detection coupled to microchip based analytical systems can yield portable clinical devices capable of fast and/ or high throughput analysis. All papers including combined electrochemical and surface analytical measurements are welcome.

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

November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

A one page abstract (500 words maximum) must be submitted via the ECS website. This abstract should clearly indicate the purpose of the work, the approach, the manner and the degree to which the work advances the field, and specific results and their significance. A copy of the abstract must also be submitted to one of the symposium organizers. Abstracts, suggestions and inquiries should be sent to ECS headquarters and to the following symposium organizers: **G. Brisard** e-mail: gessie.brisard@usherbrooke.ca; and **C. Henry** e-mail: cshenry@lamar.colostate.edu.

14

Microfluidics for Electrochemical Systems

Physical and Analytical Electrochemistry / Sensor

The organizers of this symposium are soliciting papers in all areas of microfluidics and nanofluidics for electrochemical systems, including areas of electroanalytical systems, bioanalysis, batteries, and fuel cells. Topics could include (but are not limited to): amperometric and voltammetric detection for capillary electrophoresis and microchip electrophoresis; laminar flow-based batteries and fuel cells; C-MEMS; electrochemical measurements on lab-on-a-chip devices; microchip electroporation; and microchip biosensing and bioanalysis.

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 November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Organizers: **S. D. Minteer**, Saint Louis University, e-mail: minteers@slu.edu; and **P. Hesketh**, Georgia Institute of Technology, e-mail: peter.hesketh@me.gatech.edu.

15

Multifunctional Carbon Materials for Electrochemical and Electronic Applications 2

Physical and Analytical Electrochemistry / Fullerenes, Nanotubes, and Carbon Nanostructures / Dielectric Science & Technology / Energy Technology / Industrial Electrochemistry & Electrochemical Engineering

Carbon materials are employed in numerous electrochemical and electronic technologies, and there are a wide range of microstructures utilized by researchers, such as diamond, diamond-like carbon, graphite, amorphous carbon, carbon fiber, glassy carbon, nanotubes and fullerenes. In order for these carbons to function properly and optimally, one needs to understand how factors, such as the surface chemistry, microstructure, and electronic properties, affect the electrical and electrochemical behavior. The objective of this symposium is to provide a forum for the presentation and discussion of recent developments in the science, technology, and application of carbon materials including: diamond and diamond-like carbons; nanotubes and fullerenes; and amorphous and graphitic carbons.

Papers are also sought in the following areas: (1.) carbon materials in electroanalysis; (2.) carbon materials in energy storage and conversion devices; (3.) activated carbons, carbon fibers and conducting diamond for use in the electrochemical treatment (remediation and disinfection) of water; (4.) carbon materials as platforms for chemical and biological sensing, and molecular electronics; and (5.) carbon materials for electronic devices and electron emission.

Papers describing both basic and applied research are desired but the authors should place emphasis on addressing the processing and fabrication of the carbon, the control

of the surface microstructure, chemistry and electrical properties, and their effect on the material properties and performance. Both oral and poster presentations are welcome.

An issue of *ECS Transactions* is planned to be published "AFTER" the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **G. M. Swain**, Michigan State University, e-mail: swain@chemistry.msu.edu; **M. D. Porter**, Iowa State University, e-mail: mporter@porter1.ameslab.gov; **R. L. McCreery**, The Ohio State University, e-mail: mcCreery@chemistry.ohio-state.edu; **D. Scherson**, Case Western Reserve University, e-mail: daniel.scherson@case.edu; **J. L. Davidson**, Vanderbilt University, e-mail: jim.davidson@vanderbilt.edu; **P. V. Kamat**, University of Notre Dame, e-mail: pkamat@nd.edu; and **A. Wieckowski**, University of Illinois, e-mail: andrzej@scs.uiuc.edu.

16

Photoelectrochemistry

Physical and Analytical Electrochemistry

With the recent surge of interest in renewable energy, there is a need to renew discussion of fundamental processes relevant to these technologies. This symposium focuses on a discussion of photo-electrochemical principles, systems, materials and applications with special emphasis on energy conversion. Contributions are sought in all relevant areas including: (1.) photovoltaic conversion processes; (2.) photoelectrocatalysis; (3.) photoelectrochemical hydrogen or fuel production; (4.) photoelectrochemical device design and construction; and (5.) biological or bio-mimicking systems.

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 November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **T. Zawodzinski**, Case Western Reserve University, e-mail: taz5@case.edu; and **J. Turner**, National Renewable Energy Lab, e-mail: john.turner@nrel.gov.

J—SENSORS AND DISPLAYS: PRINCIPLES, MATERIALS, AND PROCESSING

J1

Impedance and Capacitive Based Sensors

Sensor / Industrial Electrochemistry & Electrochemical Engineering / Physical and Analytical Electrochemistry

The purpose of this symposium is to bring together leading experts with a variety of different experimental and theoretical skills working in areas of electrochemical impedance and capacitive-based sensors and analytical systems. Capacitive sensors can directly sense a variety of variables such as motion, chemical composition or electric field and, indirectly, sense many other variables that can be converted into motion or permittivity, such as pressure, acceleration, fluid level, and fluid composition.

The capacitive transducer is interrogated by methods of impedance spectroscopy. Impedance spectroscopy-based on-line *in situ* measurements, capacitive or otherwise, represent a rich multi-discipline area of science that has been applied to a large number of important areas of research, such as: (1.) corrosion studies and corrosion control; (2.) monitoring of properties of electronic and ionic conducting polymers and coatings; (3.) measurements in energy storage, batteries, and fuel cells-related systems; (4.) mechanical measurements; (5.) biological, biocellular, and biomedical sensors; (6.) measurements in semiconductors, solid electrolytes, and electronic conductors; and (7.) studies of electrochemical kinetics, reactions and processes and their control.

The aim is to show the power of electrochemical impedance spectroscopy for understanding electrochemical systems: characterizing homogeneous and heterogeneous materials by their charge transport and dielectric properties, recognizing effects and signatures of surface layers, studying space charge regions at the interfaces or in the bulk solution, determining kinetics of electrochemical and chemical reactions. The symposium also welcomes papers dedicated to fundamental research in electrochemical impedance devices and recent advances in the impedance instrumentation, data collection and processing, and process monitoring where it relates to electrochemistry.

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 November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **V. Lvovich**, Lubrizol Corp., e-mail: vlv@lubrizol.com; **P. Vanysek**, Northern Illinois University, e-mail: pvanysek@niu.edu; and **M. E. Orazem**, University of Florida, e-mail: meo@che.ufl.edu.

J2

Physics and Chemistry of Luminescent Materials 16

Luminescence and Display Materials

This symposium will focus on various aspects of luminescence, in both organic and inorganic solids, and will address current and emerging technical and scientific issues in luminescence. Presentations at this meeting will cover photoluminescent materials for lamp and laser applications, cathodoluminescent materials, scintillators, electroluminescent materials, persistent phosphors, and phosphors for plasma display panels (vacuum ultraviolet excited phosphors), and other optical devices. Presentations on chemical aspects of luminescence will include the designed synthesis of conventional and novel luminescent materials, including nanophases and optimization of luminescence properties, such as brightness, color, response time, excitation spectra, etc. via modification of particulate and surface characteristics; and exploring new materials by combinatorial chemistry. Presentations involving physics of luminescence will cover measurements and modeling of luminescent properties; identification of luminescent and loss centers; non-radiative processes; energy transfer; and concentration effects; complex luminescence processes such as core valence luminescence, cooperative phenomena, nonlinear optical processes; and ultra-fast transitions. Papers on multiphoton transitions, luminescence from confined systems, etc., luminescence from novel materials such as ceramics, glass, and nano-particles are encouraged.

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full text manuscript for the issue no later than November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically via the ECS website. Suggestions and inquiries should be sent to the symposium organizers: **A. M. Srivastava**, GE GRC, e-mail: srivastava@crd.ge.com; **K. Mishra**, Osram Sylvania, e-mail: kailash.mishra@sylvania.com; and **U. Happek**, University of Georgia, e-mail: uhappek@hal.physast.uga.edu.

J3

Sensor, 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 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; novel routes for the synthesis of materials with grain (pore) size control and distributions; (2.) novel sensor and actuator concepts, design, modeling, and verification; (3.) sensing systems that include sampling systems and actuators like sensor arrays, electronic noses and tongues; (4.) 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; and (8.) novel techniques to expand and insure sensor stability and reliability.

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 November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically via the ECS website, and suggestions and inquiries should be sent to the symposium organizers: **R. Mukundan**, Los Alamos National Lab, e-mail: mukundan@lanl.gov; **S. Bhansali**, University of South Florida, e-mail: bhansali@eng.usf.edu; and **M. T. Carter**, Eltron Research Inc, e-mail: mtcarter@eltronresearch.com.

J4

Sensor Arrays and Multi-Dimensional Sensor Systems

Sensor

Sensor arrays are becoming a topic of great interest for the enhancement of the analytical performances of microsenors. This symposium will provide a venue for those interested in the integration and multiplexing of sensor arrays for miniature analytical systems. Both fundamental and applied aspects related to their manufacture, evaluation, and calibration are included. Some of the topics under this symposium are: orthogonal sensor platforms, biosensor multiplexing, sensor array functionalization, selective coating materials, novel nanomaterials, methods for integration, fluidic sampling system, and sensor array packaging. Particular emphasis should be placed on potential applications of these devices.

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 November 1, 2007. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

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