

# **CALL FOR PAPERS**

## **213<sup>TH</sup> ECS MEETING**



**Phoenix Convention Center & Hyatt Regency  
Phoenix, AZ**

**MAY 18-23, 2008**



# 213<sup>th</sup> ECS Meeting

## MAY 18-23, 2008

### Phoenix, AZ

**Abstracts are due no later than December 17, 2007.**  
**NOTE: Some abstracts are due earlier; check each symposium listing.**

#### Abstract Submission and Deadlines

Submit one original meeting abstract electronically via [www.electrochem.org](http://www.electrochem.org), no later than **December 17, 2007**. Faxed abstracts, late abstracts, and abstracts more than one page in length will not be accepted. In February 2008, 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.

**Note: Some abstracts are due earlier than December 17, 2007.** Please carefully check symposium listing for any alternate abstract submission deadlines. **For complete details on abstract submission and symposia topics, please visit the ECS website.**

Meeting abstracts should explicitly state objectives, new results, and conclusions or significance of the work. Abstracts **must** be properly formatted and no more than **one page in length**. Please use the preformatted template located at: [http://www.electrochem.org/meetings/guidelines/abst\\_temp\\_info.htm](http://www.electrochem.org/meetings/guidelines/abst_temp_info.htm). Programming for this meeting will occur in January of 2008, with some papers scheduled for poster presentation. Check the ECS website for further program details.

#### Paper Presentation

All authors selected for either oral or poster presentations will be notified in February of 2008. Oral presentations must be in English. Only LCD projectors will be provided for oral presentations.

**Presenting authors are 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 two weeks 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

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

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.

#### Financial Assistance

Financial assistance is very limited and generally governed by the symposium organizers. Individuals may inquire directly to the symposium organizers of the symposium in which they are presenting their paper to see if funding is available. Individuals requiring an official letter of invitation should write to the ECS headquarters office; such letters will not imply any financial responsibility of ECS. Students seeking financial assistance should consider awarded travel grants (see page 80 of this issue of *Interface*). Young Faculty Travel Grants are also available (see page 47).

#### Hotel Reservations

The 213<sup>th</sup> Meeting will be held at the Phoenix Convention Center, Phoenix, Arizona. The Hyatt Regency Phoenix is the Meeting Headquarters Hotel.

Special rates have been reserved at the Hyatt for participants attending this meeting. The reservation deadline is **April 18, 2008**. Please refer to the ECS website for rates and reservations.

#### Meeting Registration

All participants, including authors and invited speakers of the 213<sup>th</sup> ECS Meeting, are required to pay the appropriate registration fees. Hotel and meeting registration materials will be distributed in February of 2008 and will also be available on the ECS website ([www.electrochem.org](http://www.electrochem.org)). The deadline for advance registration is **April 18, 2008**.

#### Short Courses

The 213<sup>th</sup> ECS Meeting will also include several short courses on Sunday, May 18, 2008 from 9:00 AM – 4:30 PM. Short Course fees are currently \$425 for Members, \$520 for Nonmembers, and are subject to change without notice. A 50%

discount will be given to students with student verification. Short Courses require advance registration and may be cancelled if enrollments are too low. Please check our website for any last-minute details ([http://www.electrochem.org/education/short\\_courses/short\\_courses.htm](http://www.electrochem.org/education/short_courses/short_courses.htm)). The current Short Topics planned are as follows; this list is subject to change: Electrochemical Biosensors Based on Nanomaterials, Advanced Impedance Spectroscopy, Electroplating for ULSI and Microelectronics Circuitry, MEMS Reliability and Packaging, and Atomic Force Microscopy.

#### Technical Exhibit

The 213<sup>th</sup> ECS Meeting will also include a Technical Exhibit, featuring presentations and displays by over 30 manufacturers of instruments, materials, systems, publications, and software of interest to meeting attendees. Full exhibit booths manned by company representatives cost \$1,800 and include one free meeting registration. Literature display tables (unmanned by company representatives; no meeting registration included) will also be available for \$850. Parties interested in exhibiting should contact Amir Zaman at the ECS headquarters office for more information. Coffee breaks are scheduled each day in the exhibit hall along with evening poster sessions.

#### 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: less than \$1,000.

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

#### Contact Information

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

# SYMPOSIUM TOPICS

## A General Topics

- A1—General Student Poster Session
- A2—IDEAS: Intriguing Disclosures on Electrochemical Advances Symposium
- A3—Nanotechnology General Session
- A4—Tutorials in Nanotechnology: Focus on Energy and Technology

## B Batteries, Fuel Cells, and Energy Conversion

- B1—Batteries General Session
- B2—Alkaline Electrochemical Power Sources
- B3—Biological Fuel Cells 3
- B4—Characterization of Porous Materials
- B5—Fundamentals of Energy Storage and Conversion
- B6—Ionic and Mixed Conducting Ceramics 6
- B7—Photovoltaics for the 21st Century 4
- B8—Proton Transfer and Transport in Fuel Cells

## C Biomedical Applications and Organic Electrochemistry

- C1—Electrochemistry in Biological Analysis
- C2—Electrochemotherapy
- C3—Manuel M. Baizer Award Symposium on Organic Electrochemistry
- C4—Organic and Biological Electrochemistry Symposium in Honor of Yoshihiro Matsumura

## D Corrosion, Passivation, and Anodic Films

- D1—Corrosion General Session

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

- E1—Advanced Gate Stack, Source/ Drain, and Channel Engineering for Si-Based CMOS 4: New Materials, Processes, and Equipment
- E2—Chemical Mechanical Polishing 9
- E3—Dielectrics for Nanosystems 3: Materials Science, Processing, Reliability, and Manufacturing
- E4—Plasma Processing 17
- E5—State-of-the-Art Program on Compound Semiconductors (SOTAPOCS 48)
- E6—Thermal and Plasma CVD of Nanostructures
- E7—ZnO, InZnO, and InGaO Related Materials and Devices for Electronic and Photonic Applications

## F Electrochemical / Chemical Deposition and Etching

- F1—Electrodeposition for Energy Applications

## G Electrochemical Synthesis and Engineering

- G1—Industrial Electrochemistry and Electrochemical Engineering General Session
- G2—Multiscale Simulations of Electrochemical Systems – Computational Aspects
- G3—Tutorials in Electrochemical Technology: Impedance Spectroscopy

## H Fullerenes, Nanotubes, and Carbon Nanostructures

- H1—Electron Transfer and Applications of Fullerene and Nanostructured Materials, in Honor of David Schuster
- H2—Molecular and Supramolecular Chemistry of Fullerenes and Carbon Nanotubes
- H3—Carbon Nanotubes and Nanostructures: Fundamental Properties and Processes
- H4—Carbon Nanotubes and Nanostructures: Applications and Devices
- H5—Endofullerenes and Carbon Nanocapsules
- H6—Energetics and Structure and Solid-State Physics
- H7—Carbon Nanotubes and Nanostructures: Medicine and Biology
- H8—Porphyrins and Supramolecular Assemblies
- H9—Metallic and Semiconducting Nanoparticles for Energy Conversion

## I Physical and Analytical Electrochemistry

- I1—Physical and Analytical Electrochemistry General Session
- I2—Exploiting Magnets and Magnetic Fields in Electrochemical Systems and Devices

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

- J1—Sensors, Actuators, and Microsystems General Session
- J2—Acoustic Wave-Based Sensors and Sensor Systems
- J3—Electrochemical Nano/Biosensors

## 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](http://www.electrochem.org). To apply for a travel grant use the application form below.

**Application Requirements**—All applications for the 213<sup>th</sup> meeting in Phoenix, Arizona, May 18-23,

2008, must be received no later than December 17, 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-\$750 depending on the student's estimated expenses and the funds available from Divisions. ■

## Travel Grant Application Phoenix, AZ

The Society's Battery, Corrosion, Dielectric, 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 Phoenix, AZ May 18-23, 2008. 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 Advanced 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](mailto:rmanth@mail.utexas.edu).
- ☐ Corrosion—Send to: N. Misra, Sandia National Labs, MS 1415, P.O. Box 5800, Albuquerque, NM 87185-0100, USA. E-mail: [namisse@sandia.gov](mailto:namisse@sandia.gov)
- ☐ Dielectric—Send to: H. Rathore, IBM, Internal Mail Stop AE1,B/640, 2070 Rte 52, Hopewell Junction, NY 12533, USA. E-mail: [rathore@us.ibm.com](mailto:rathore@us.ibm.com)
- ☐ Electrodeposition—Send to: L. Deligianni, IBM T J Watson Research Center, 1101 Kitchawan, Yorktown Heights, NY 10598, USA. E-mail: [lili@us.ibm.com](mailto: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@cche.ufl.edu](mailto:ren@cche.ufl.edu)
- ☐ Energy Technology—Send to: S. Calabrese Barton, Michigan State University, Dept. of Chem. Eng. and Mats. Sci, 2527 Engineering Building, East Lansing, MI 48824, USA. E-mail: [scb@msu.edu](mailto: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](mailto:jwfergus@eng.auburn.edu)
- ☐ IEEE—Send to: G. Botte, Ohio University, Russ College of Eng & Tech, 183 Stocker Center, Athens, OH 45701, USA. E-mail: [botte@bobcat.ent.ohio.edu](mailto:botte@bobcat.ent.ohio.edu)
- ☐ OBE—Send to: I. Taniguchi, Kumamoto University, Fac. of Appl. Chem & Biochem., 2-39-1 Kurokami, Kumamoto 860-8555, Japan. E-mail: [taniguchi@gpo.kumamoto-u.ac.jp](mailto:taniguchi@gpo.kumamoto-u.ac.jp)
- ☐ Physical and Analytical Electrochemistry—Send to: S. Minteer, Saint Louis University, Dept of Chemistry, 221 N Grand Blvd, Saint Louis, MO 63103, USA. E-mail: [minteer@slu.edu](mailto:minteer@slu.edu)
- ☐ Sensor—Send to: Y-L. Chang, Nanomix, Inc., 5980 Horton Street, Suite 600, Emeryville, CA 94608, USA. E-mail: [ychang@nano.com](mailto:ychang@nano.com)

**Applications for Travel Grants for the Phoenix, AZ meeting must be received no later than December 17, 2007.**



# Phoenix, AZ Call for Papers | May 18-23, 2008

## 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 June 2, 2008. All manuscripts will be submitted online, and must be in either MS Word or PDF format.**

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **V. Desai**, New Mexico State University, e-mail: vimalc@nmsu.edu; and **V. Subramanian**, Tennessee Tech University, e-mail: vsubramanian@tntech.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 ECS. 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 emergence of nanotechnology as a major field of research has touched almost every scientific discipline. The number of applications for materials that are prepared on a nanometer scale is expanding rapidly. The advancement of these applications is made possible by the new methods of preparation and characterization of materials and composites on a nanometer scale. Examples include catalysts for fuel cell applications, semiconductors for photovoltaic and photoelectrochemical solar energy conversion, and chemical and biological sensors.

This symposium will focus on critical issues and state-of-the-art developments in the science and technology of nanostructured materials. Papers are solicited in all areas related to materials including metals, ceramics, semiconductors, molecular electronics, and organic compounds and polymers.

Areas of interest include: semiconductor and metal nanoparticles and metal/semiconductor nanocomposites; size quantization effects in semiconductor nanoparticles; fundamentals of nucleation and growth of nanoparticles; novel synthesis methods of nanostructured materials; processing of nanostructured materials; advanced characterization techniques for nanostructured materials; modelling and tailoring of nanostructured materials; nanocomposites and interfacial phenomena; photoinduced charge separation and interfacial charge transfer; photoelectrochemistry of nanostructured films; photocatalysis and environmental applications; nano-ionics; nanostructured catalysts for fuel cells; nanostructured sensor surfaces; and biological applications of nanomaterials.

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

### A4

#### Tutorials in Nanotechnology: Focus on Energy and Technology

##### Energy Technology/ New Technology Subcommittee

The emergence of nanotechnology as a major field of research has impacted almost every scientific discipline. This tutorial symposium will focus on the role of nanoscale phenomena on the performance of materials for energy storage and energy conversion devices. Topics include the preparation, characterization and performance of nanostructured materials for fuel cells, batteries, electrocatalysis, hydrogen storage, and production, environment and photovoltaics. These tutorial lectures will discuss both fundamentals of nanoscience and state-of-the-art developments in nanotechnology. Papers will be by invitation only; abstracts will be submitted via 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 June 2, 2008. All manuscripts will be submitted online, and must be in either MS Word or PDF format.**

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **C. Bock**, National Research Council of Canada, Institute for Chemical Processes and Environmental Technologies, e-mail: Christina.Bock@nrc-cnrc.gc.ca; and **G. Sandi**, Argonne National Laboratory, e-mail: gsandi@anl.gov.

## **B — BATTERIES, FUEL CELLS, AND ENERGY CONVERSION**

### **B1 Batteries General Session**

#### **Battery**

Original papers are solicited on all types of batteries, except for alkaline batteries, which will be highlighted at this meeting in a separate symposium. Of particular interest are recent developments of advanced battery materials, novel battery designs, and optimization and breakthroughs in performance. Reviews of the state-of-the-art battery performance for specific applications, including consumer devices, hybrid or electric vehicles, and distributed energy systems, are also encouraged.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **N. Dudney**, Oak Ridge National Laboratory, e-mail: dudneynj@ornl.gov; **K. M. Abraham**, Northeastern University, e-mail: kmabraham@comcast.net; and **K. Zaghbi**, Institut de Recherche d'Hydro-Québec, e-mail: zaghbi.karim@ireq.ca.

### **B2 Alkaline Electrochemical Power Sources**

#### **Battery / Energy Technology**

Alkaline electrochemical power sources may offer significantly improved performance over those using acid electrolytes, such as the proton exchange membrane fuel cell (PEMFC). For example, in favorable circumstances the alkaline fuel cell (AFC) may allow a much higher performance than the PEMFC due to its faster cathode reaction and lower Tafel slope. Moreover, non-precious metal catalysts have sufficient stability to be used in the AFC, decreasing system cost. This symposium covers all aspects of alkaline electrochemical power sources (alkaline fuel cells, direct borohydride fuel cells, alkaline membrane direct methanol fuel cells, alkaline batteries, and alkaline supercapacitors). Topics of interest include, but are not limited to: (1.) electrocatalysts and fundamental aspects of redox processes; (2.) alkaline electrolytes (liquid alkaline electrolytes, anion conducting membranes, and cation conducting membranes); (3.) advanced electrode materials and structures; (4.) cell and system design, including reactant supply, product elimination, means of cooling, and materials; (5.) electrochemical performance and cell characterization; (6.) modeling and simulation of electrochemical phenomena and processes; and (7.) applications.

**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 June 2, 2008. All manuscripts will be submitted online, and must be in either MS Word or PDF format.**

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **C. Wang**, Tennessee Technological University, e-mail: cswang@tntech.edu; **R. Mantz**, U.S. Army Research Office, e-mail: robert.a.mantz@us.army.mil; and **J. Xu**, Rutgers, The State University of New Jersey, e-mail: johnxu@rci.rutgers.edu.

### **B3**

### **Biological Fuel Cells 3**

#### **Energy Technology / Physical and Analytical Electrochemistry / Organic and Biological Electrochemistry**

Electrical energy production using biological species has received growing research attention. Papers are solicited on fundamental and applied aspects of fuel cell and battery technology that incorporate enzymes, microbes, or other biological species as catalysts, fuel sources, transport agents, or other such roles. Of interest are fundamental studies focusing on heterogeneous electron transfer coupled with oxidation or reduction reactions, including direct or mediated electron transfer between electrodes and enzymes or microbes; catalysis at electrode-supported membranes, electrode modification chemistries for immobilization or stabilization of electrochemically addressable catalytic moieties, and engineered electrode systems facilitating mass transfer of fuels and wastes. Papers addressing practical issues of electrode reaction rate, operating potential, and electrode stability are welcome, as is work towards developing mechanistic and system-level models that elucidate aspects of biological fuel cells. Strategies aimed at utilization of biological materials in fuel cells for portable power, implanted medical devices, energy scavenging, or other novel applications are appropriate for this symposium. Our goal is to bring together a multidisciplinary representation of research in this broad area to redefine the existing state-of-the-art, and address remaining challenges for practical implementation of these technologies.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **S. Calabrese Barton**, Michigan State University, e-mail: scb@msu.edu; **P. Atanassov**, University of New Mexico, e-mail: plamen@unm.edu; **K. Kano**, Kyoto University, e-mail: kkano@kais.kyoto-u.ac.jp; **S. Minteer**, Saint Louis University, e-mail: minteer@slu.edu; and **I. Taniguchi**, Kumamoto University, e-mail: taniguch@gpo.kumamoto-u.ac.jp.

### **B4**

### **Characterization of Porous Materials**

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

This symposium provides a forum for recent advances in experimental techniques and mathematical models to characterize the properties of porous materials employed in a wide range of electrochemical applications. Porous materials are used in practical applications of electrocatalysis, batteries, supercapacitors, fuel cells, and other electrochemical technologies. The understanding of porous materials through characterization techniques and models is critical to improve the performance, durability and reliability of these devices. Papers dealing with every

aspect of the electrochemistry of porous electrode materials will be accepted, including theory of porous materials, description of the preparation procedure, property characterization and modeling techniques including (but not limited to) electronic and ionic conductivity, porosity, reactivity, gas and liquid transport, surface energy and interaction between different phases and interfaces and also the distribution of the same within the porous material, studies of their electrochemical responses and applications. Furthermore, understanding the life cycle of porous materials from beginning of life properties till end of life properties and its impact on durability of electrochemical devices is essential for commercial viability of these electrochemical technologies. Contributions covering any of these aspects are welcomed.

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

**B5**

## Fundamentals of Energy Storage and Conversion

### Battery / Energy Technology

A better understanding of elementary processes involved in electrochemical energy storage and energy conversion is crucial to the further optimization of batteries, double layer capacitors and fuel cells. This symposium will focus on the science underlying the operation of these devices that may help improve their overall performance and durability. Topics of interest in the energy storage area include basic aspects of the thermodynamics and kinetics of lithium alloys, intercalation anodes and cathodes, composite polymer electrolytes, metal hydrides, and ultra/supercapacitive electrodes. Topics of interest in the general area of fuel cells include but are not restricted to catalysts for the electro-oxidation of hydrogen and organic fuels, catalysts for oxygen reduction, supported and unsupported materials, as well as catalysts for fuel processing, porous electrode structures, polymer electrolytes for PEM and solid oxide fuel cells, as well as mechanisms associated with reactions at catalytic electrode-electrolyte interfaces.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **D. Scherson**, Case Western Reserve University, e-mail: dxsl6@po.cwru.edu; and **J. Harb**, Brigham Young University, e-mail: john\_harb@byu.edu.

**B6**

## Ionic and Mixed Conducting Ceramics 6

### High Temperature Materials / Battery / Energy Technology

Ceramic materials that exhibit high ionic conduction or significant levels of both ionic and electronic conduction continue to be of great interest among researchers

worldwide. This symposium will provide a forum to share data and discuss activities in this exciting field. Both fundamental and applied aspects of ionic conduction and mixed conduction will be included. Some of the topics that will be covered in this symposium are: ionic transport in solid electrolytes, advances in protonic conductors, electrolyzers, fuel cells and batteries, mechanisms of mixed conduction in ceramics, role of microstructure in conduction, dense ceramic membranes for separation and chemicals production, electrocatalytic phenomena, ceramic sensors, electrochemistry of nano ceramics, and transport in corrosion-resistant ceramic films.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **M. Mogensen**, Risoe National Laboratory, e-mail: mogens.mogensen@risoe.dk; **T. Armstrong**, Oak Ridge National Laboratory, e-mail: armstrongt@ornl.gov; **T. Gur**, Stanford University, e-mail: turgut@stanford.edu; and **H. Yokokawa**, Energy Technology Research Institute, National Institute of Advanced Industrial Science and Technology, e-mail: h-yokokawa@aist.go.jp.

**B7**

## Photovoltaics for the 21st Century 4

### Energy Technology / Electronics and Photonics

Depletion of conventional fuel sources and environmental pressures associated with corresponding energy production processes created a climate susceptible for the development of the only renewable energy source with sufficient reserves to meet the needs of future generations: solar energy. Photovoltaic devices represent a sustainable long term solution to convert energy from the sun since the cumulative system energy output currently exceeds the energy required for fabrication, transport, installation, operation and decommissioning. Such a benefit partly explains the high worldwide photovoltaic system production growth rate of 27% observed during the last 5 years. Major manufacturers are located in Japan, the United States, Germany, and Spain.

Improvement in photovoltaic device energy conversion efficiency, unit cost, manufacturability (mechanically flexible designs able to conform to a multitude of geometries) and stability (humidity sensitive semiconducting organic compounds, thin film mechanical stability, etc.) are needed for all first (Si), second (CuInGaSe<sub>2</sub> polycrystalline thin films), and third generation technologies (solid state and dye sensitized organic cells, quantum dot semiconductors, carbon nanostructures, etc.) to phase out government subsidy programs and ensure commercial success. Contributions addressing fundamental and applied aspects are requested for all potential improvements including solar cell design, development of new materials and characterization methods leading to fundamental understanding of limiting factors (operational mechanisms such as charged species pair formation, charge separation, excited state relaxation and charge transfer, structure/property relationships, material morphology, etc.) that can translate into new tailored material routes. Design approaches include better exploitation of the solar spectrum by down-conversion, photoluminescence, and up-conversion by adding new layers, use of thin layers and multi-junction devices, moisture barriers to limit degradation, etc. Materials include semiconductor nanoparticles leading to the creation of multiple electron/hole pairs



from a single photon, self-ordering and assembling of carbon nanostructures, molecular assemblies or clusters reproducing photosynthesis processes, nanostructured semiconductors, organic/inorganic hybrid assemblies, semiconductor quantum dots (generation of multiple charge carriers), etc.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **M. Tao**, University of Texas, e-mail: mtao@uta.edu; **S. Al Hallaj**, Illinois Institute of Technology, e-mail: alhallaj@iit.edu; **P. Chang**, Northrop Grumman Space Technology, e-mail: pablo.chang@ngc.com; and **J. Ruzyllo**, Pennsylvania State University, e-mail: jruzylo@psu.edu.

**B8**

## Proton Transfer and Transport in Fuel Cells

### Physical and Analytical Electrochemistry / Energy Technology

Proton transfer and transport is a significant feature in all fuel cell electrolytes, even for alkaline fuel cells. Our understanding of these processes has progressed significantly through greater understanding of these processes in water, polymer electrolytes, and in electrolytes such as ionic liquids. For this symposium, we invite contributions on all aspects of proton conduction and related topics, including: (1.) synthesis and processing of new proton-conducting materials; (2.) computational and experimental studies of proton transfer processes; (3.) elucidation of structure-property relationships in proton conductors; (4.) application of proton conductors in fuel cells as electrolytes and components of electrodes; and (5.) of special interest are discussions of factors that enhance proton transport under fuel cell conditions.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **T. Zawodzinski**, Case Western Reserve University, e-mail: taz5@case.edu; and **S. Calabrese Barton**, Michigan State University, e-mail: scb@msu.edu.

## C — BIOMEDICAL APPLICATIONS AND ORGANIC ELECTROCHEMISTRY

**C1**

## Electrochemistry in Biological Analysis

### Organic and Biological Electrochemistry / Physical and Analytical Electrochemistry

The past decade has seen great advances of electrochemical methodology applied to bioanalytical and biomedical problems, with the development of new biomedical devices, biosensor arrays, and methods for fundamental studies of protein redox chemistry, and bio-fuel cells. This symposium seeks invited and contributed papers in electrochemistry of biological analysis. We aim for as broad a range of topics as possible within this area. Possible topics include but are not limited to biomolecular recognition arrays, fundamental

and applied studies of proteins related to biological analysis, bio-fuel cells for medical use, synergistic combinations of nanoscience with bioelectrochemistry, and new biomedical devices with electrochemical feedback.

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**C2**

## Electrochemotherapy

### Physical and Analytical Electrochemistry

Electrochemotherapy, which combines conventional drug treatment with short high voltage pulsed electric fields to improve delivery, is an exciting new approach to treating certain types of cancer that is proving its efficacy. Every year, 4 million new cases of cancer are diagnosed and 750,000 people die of the disease in Europe alone. As life expectancy in most European countries rises, so do cancer-related deaths. Indeed, cancer is likely to remain one of the biggest killers in the 21st century.

Although there is no known cure for cancer, there are various approaches to treating one of the industrialized world's deadliest diseases, such as radiotherapy, chemotherapy, and the surgical removal of cancer tissue. A novel approach called electrochemotherapy has recently emerged to augment the medical profession's arsenal of effective weapons.

This new treatment combines conventional chemotherapeutic agents with short high voltage pulsed electric fields in order to render the membrane of the tumor cells more porous and, thus, receptive to the drugs being administered. Specific areas of interest include: (1.) electroporation with needle array of Bleomycin into tumors; (2.) electroporation and iontophoresis of pig skin; (3.) electrochemotherapy of mouse tumors; (4.) electroporation in a single cell; (5.) electroporation of conductivity of cell suspension; (6.) loading of erythrocytes with small molecules by electroporation; (7.) reduced blood flow and oxygenation in SA-1 tumors after electrochemotherapy with Cisplatin; (8.) quantitative study of electroporation-mediated molecular uptake and cell viability; (9.) diverse effects of nanosecond pulsed electric fields on cells and tissues; (10.) electrical field improvements in electrochemotherapy by Rafael Davalos; (11.) new research and improvements in electrochemotherapy; and (12.) drugs for tumor electrochemotherapy.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **H. De Long**, AFOSR/NL, e-mail: hugh.delong@afosr.af.mil; and **R. Contolini**, Oregon Health & Science University, e-mail: rob@contolini.com.



**C3****Manuel M. Baizer Award Symposium on Organic Electrochemistry****Organic and Biological Electrochemistry**

This symposium will be in honor of the winner/s of the Eighth International Manuel M. Baizer Award. In keeping with the spirit of the award, which is for "outstanding scientific achievements in the electrochemistry of organics," this symposium will be a showcase of organic and bio-organic electrochemical reactions and deal with all aspects of electro-organic synthesis and mechanistic studies in organic, organometallic, and bio-organic electrochemistry.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **F. Maran**, University of Padova, e-mail: flavio.maran@unipd.it; **K. Moeller**, Washington University at St. Louis, e-mail: moeller@wusl.edu; **H. Tanaka**, Okayama University, e-mail: tanaka95@cc.okayama-u.ac.jp; and **M. Workentin**, University of Western Ontario, e-mail: mworkent@uwo.ca.

**C4****Organic and Biological Electrochemistry Symposium in Honor of Yoshihiro Matsumura****Organic and Biological Electrochemistry**

Submissions are solicited in all areas of organic, organometallic, physical organic, and biological electrochemistry. Areas of interest include synthetic and mechanistic electrochemistry as well as industrial and educational applications. If there are a small number of submissions for oral presentation, they will be transferred to the Manuel Baizer Award Symposium in Organic Electrochemistry.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizer: **I. Nishiiguchi**, Nagaoka University of Technology, e-mail: nishiiku@vos.nagaokaut.ac.jp; **D. Peters**, Indiana University, e-mail: peters@indiana.edu; **J. Yoshida**, Kyoto University, e-mail: yoshida@sbchem.kyoto-u.ac.jp.

**D — CORROSION, PASSIVATION, AND ANODIC FILMS****D1****Corrosion General Session****Corrosion**

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

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizer: **A. Davenport**, University of Birmingham, e-mail: a.davenport@bham.ac.edu.

**E — DIELECTRIC AND SEMICONDUCTOR MATERIALS, DEVICES, AND PROCESSING****E1****Advanced Gate Stack, Source/Drain, and Channel Engineering for Si-Based CMOS 4: New Materials, Processes, and Equipment****Electronics and Photonics / Dielectric Science and Technology / High Temperature Materials**

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

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

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **F. Roozeboom**, NXP Semiconductors, e-mail: Fred.Roozeboom@nxp.com; **E. P. Gusev**, Qualcomm MEMS Technologies, e-mail: gusev@qualcomm.com; **H. Iwai**, Frontier Collaborative Research Center, Tokyo Institute of Technology, email: iwai@ae.titech.ac.jp; IBM T. J. Watson Research Center, e-mail: skoester@us.ibm.com; **D. L. Kwong**, Institute of Microelectronics, e-mail: kwongdl@ime.a-star.edu.sg; **M. C. Öztürk**, North Carolina State University, e-mail: mco@ncsu.edu; and **P. J. Timans**, Mattson Technology Inc., e-mail: Paul.Timans@mattson.com.

**E2****Chemical Mechanical Polishing 9****Dielectric Science & Technology**

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

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

**E3****Dielectrics for Nanosystems 3: Materials Science, Processing, Reliability, and Manufacturing****Dielectric Science and Technology /  
IEEE Electron Devices Society**

Advanced semiconductor products that are true representatives of nanoelectronics have reached below 100 nm. Depending on the application, the nanosystem may consist of one or more of the following types of functional components: electronic, optical, magnetic, mechanical, biological, chemical, energy sources, and various types of sensing devices. As long as one or more of these functional devices is in 1-100 nm dimensions, the resultant system can be defined as nanosystem. Papers are solicited in all areas of dielectric issues in nanosystems. In addition to traditional areas of semiconductor processing and packaging of nanoelectronics, emphasis will be placed on areas where multifunctional device integration (through innovation in design, materials, and processing at the device and system levels) will lead to new applications of nanosystems.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **D. Misra**, New Jersey Institute of Technology, e-mail: dmisra@njit.edu; **T. Chikyow**, Advanced Electronic Materials Center, NIMS, e-mail: chikyo.toyohiro@nims.go.jp; **H. Iwai**, Tokyo Institute of Technology, e-mail: iwai@ep.titech.ac.jp;

and **J. Vanhellemont**, Ghent University, e-mail: jan.vanhellemont@telenet.be.

The program committee consists of the following persons: Tayo Akinwande (Massachusetts Institute of Technology), William D. Brown (University of Arkansas), Dennis Hess (Georgia Institute of Technology), Vik J. Kapoor (University of Delaware), Krishna Saraswat (Stanford University), Randhir Thakur (Applied Materials), and Sunit Tyagi (Intel).

**E4****Plasma Processing 17****Dielectric Science & Technology / Electronics and Photonics**

This symposium is aimed at bringing together the technical community working and interested in the patterning of films used in the fabrication of sub-100 nm devices and integrated circuits. Both etching and plasma enhanced deposition processes are included. Suggested topics include: (1.) new reactor technologies and plasma sources; (2.) processes for etching high- and low-k films including reactor contamination management; (3.) plasma patterning of noble metals for FeRAMs, MDRAMs, and TMR elements for nonvolatile memories; (4.) plasma surface modification and mechanisms of k-value degradation; (6.) mechanisms, measurement, and control of damage, including VUV device damage from HDP plasmas in etching and deposition.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **G. S. Mathad**, S/C Technology Consulting, e-mail: swami\_mathad@hotmail.com; **M. Engelhardt**, Infineon Technologies, e-mail: manfred.engelhardt@qimonda.com; and **D. W. Hess**, Georgia Institute of Tech., e-mail: dennis.hess@che.gatech.edu.

**E5****State-of-the-Art Program on Compound Semiconductors (SOTAPOCS 48)****Electronics and Photonics**

The SOTAPOCS 48 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.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **M. Overberg**, Sandia National Laboratories, e-mail: meoverb@sandia.gov; **B. Gila**, University of Florida, e-mail: bgila@mse.ufl.edu;

**P. Nam**, Northrop Grumman, e-mail: peter.nam@ngc.com; and **H. Ouyang**, National Chung Hsing University, e-mail: houyang@dragon.nchu.edu.tw.

## E6

### Thermal and Plasma CVD of Nanostructures

#### Dielectric Science & Technology

CVD, plasma enhanced CVD, and various related deposition techniques have enjoyed success in microelectronics industry. Based on their success and experience, these techniques have recently found their way into preparation of nanostructured materials. Some examples include growth of inorganic nanowires such as silicon, germanium, various oxides (zinc, indium and tin oxides), nitrides (GaN), etc. Vapor-liquid-solid (VLS) and related techniques, template assisted techniques (CVD, electrodeposition), and planar deposition are some of the popular approaches in nanowire/nanotube growth for applications into electronics, sensors, and thermoelectrics. Carbon nanotube preparation is now widely done using CVD and PECVD for patterned growth for applications in nanoelectronics, nanodevices, sensors, and field emission. A variety of other nanostructured materials such as nanopowders and nanocrystals are also prepared by these versatile techniques. The topics for this symposium include, but not limited to the above mentioned materials and applications. Papers focusing on growth mechanisms, modeling, process diagnostics, materials characterization, and advances in applications are strongly encouraged.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **M. Sunkara**, University of Louisville, e-mail: mahendra@louisville.edu; **L. Delzeit**, NASA Ames Research Center, email: Lance.D.Delzeit@nasa.gov; and **R. Mani**, Applied Materials, email: radhika\_mani@amat.com.

## E7

### ZnO, InZnO, and InGaO Related Materials and Devices for Electronic and Photonic Applications

#### Electronics and Photonics

The purpose of this symposium is to bring together the crystal growth, device processing, circuit design and applications communities to discuss basic science and technology issues related to utilization of ZnO, InZnO, and InGaO related transparent materials and devices for electronic and photonic applications. The program will consist of both invited and contributed papers. Papers are solicited in the following areas: (1.) material growth; (2.) device design; (3.) gate oxide technology; (4.) wet and dry etching techniques; (5.) doping control; (6.) contact technology; (7.) fundamental optical, physical, and electrical properties; (8.) materials and device characterization; and (9.) novel applications for ZnO, InZnO, and InGaO based materials.

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Abstracts should be submitted electronically to the ECS

headquarters, and questions and inquiries should be sent to the symposium organizers: **F. Ren**, University of Florida, e-mail: ren@che.ufl.edu; **L.-C. Chen**, National Taiwan University, e-mail: chenlc@ntu.edu.tw; **Y-W. Heo**, Kyungpook National University, e-mail: ywheo@knu.ac.kr; **J. Kim**, Korea University, e-mail: jhkim@prosys.korea.ac.kr; **J. La Roche**, Raytheon RF Components, e-mail: jeffrey\_r\_laroche@raytheon.com; **P. Shen**, Army Research Laboratories, e-mail: pshen@arl.army.mil; and **K. Shiojima**, NTT Photonics Laboratories, e-mail: shiojima@aetl.ntt.co.jp.

## F — ELECTROCHEMICAL / CHEMICAL DEPOSITION AND ETCHING

## F1

### Electrodeposition for Energy Applications

#### Electrodeposition / Energy Technology

The symposium will provide a forum for the presentation of original research concerned with the use of electrodeposition as a materials preparation and processing tool for energy conversion applications. Fundamental and applied papers are solicited on all aspects of electrodeposition including anodic and cathodic approaches, light-induced deposition, electroless deposition, and other novel approaches as they apply to energy conversion problems and systems. Topics include but are not limited to the preparation of semiconductor, metal, and superconductor thin films; magnetic materials; multi-layered systems; solar cells; semiconductor-electrolyte interfaces; and materials and systems for solar-assisted water splitting.

Topics of interest include: (1.) in situ and ex situ experimental methods for monitoring the deposition process; (2.) semiconductor, metal, and superconductor nucleation and growth and other mechanistic aspects; (3.) epitaxial growth and superlattices; (4.) semiconductor and metal nanodots; (5.) electrochemical insertion and intercalation reactions; (6.) light-induced deposition processes; (7.) template-assisted deposition; (8.) deposition of solar cell window materials and anti-reflection coatings; (9.) post-deposition electrochemical or photoelectrochemical etching and processing; (10.) catalyst preparation and modification for energy conversion devices such as fuel cells; (11.) design of new energy storage devices (e.g., batteries, hydrogen storage); and (12.) electrodeposition in energy transducer and sensor assemblies/systems.

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# G — ELECTROCHEMICAL SYNTHESIS AND ENGINEERING

G1

## Industrial Electrochemistry and Electrochemical Engineering General Session

### Industrial Electrochemistry and Electrochemical Engineering

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

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **G. Pillay**, South Dakota School of Mines and Technology e-mail: gautam.pillay@sdsmt.edu; and **L. Deligianni**, IBM, lili@usibm.com.

G2

## Multiscale Simulations of Electrochemical Systems – Computational Aspects

### Industrial Electrochemistry and Electrochemical Engineering

New electrochemical applications are being discovered where the control of events from molecular to macroscopic length scales is critical to product quality and process control. In addition, improvements in many existing technological systems are today based on understanding how to control electrochemical events occurring at near-molecular length scales. The common feature of such systems is that their behavior is largely determined as a result of concerted interactions based on electrochemical phenomena that extend over many length scales. Numerical simulation of electrochemical systems thus requires solving equations simultaneously as well as efficiently in different length and time scales.

Both analytical and numerical methods have been used by researchers to simulate electrochemical behavior under various operating conditions. Though analytical solutions are restricted to very few linear models, they provide very good insight and are ideal for case studies. With the advent of high-speed computer and user-friendly software analytical or approximate techniques may be used to obtain symbolic or closed form solutions even for nonlinear models under certain operating conditions. Different numerical methods have been used by various researchers, for, e.g., finite difference, finite element, finite-volume, collocation. Although all the numerical methods work for most models, certain numerical methods may be computationally efficient for a particular electrochemical system.

The trend toward increasingly sophisticated models that

integrate diverse phenomena which span multiple scales for simulating entire, realistic systems creates significant demand for new simulation algorithms with improved computational efficiency, and with realistic quantification of uncertainty.

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

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G3

## Tutorials in Electrochemical Technology: Impedance Spectroscopy

### Industrial Electrochemistry and Electrochemical Engineering

This symposium provides a forum for tutorial presentations concerning all aspects of electrochemical impedance spectroscopy. Contributions related to both fundamentals and applications are encouraged. Papers are solicited as well in the development of novel experimental methods, mathematical models, and methods for interpretation of data. The tutorials should be useful for students and for professionals seeking to diversify their background or break into new technological areas. The symposium will consist of both invited and contributed papers.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **M. E. Orazem**, University of Florida, e-mail: meo@che.ufl.edu; and **B. Tribollet**, UPR15 du CNRS, Laboratoire Interfaces et Systemes Electrochimiques, Université P. et M. Curie, e-mail: bt@ccr.jussieu.fr.

# H — FULLERENES, NANOTUBES, AND CARBON NANOSTRUCTURES

### Fullerenes, Nanotubes, and Carbon Nanostructures

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

Abstracts should be submitted via the ECS website. Comments and inquiries about the symposium may be sent to the organizers: **F. D'Souza**, Department of Chemistry, Wichita State University, 1845 Fairmount, Wichita, KS 67260-0051, USA, tel: 316.978.7380, fax: 316.978.3431, e-mail: Francis.DSouza@wichita.edu; and **D. M. Guldi**, Friedrich-Alexander-Universität Erlangen-Nürnberg, e-

mail: dirk.guldi@chemie.uni-erlangen.de. Abstracts, suggestions, and inquiries should be sent electronically to the ECS headquarters office and to the organizers of the corresponding symposium listed below.

H1

## Electron Transfer and Applications of Fullerene and Nanostructured Materials, in Honor of David Schuster

### Fullerenes, Nanotubes, and Carbon Nanostructures

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

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **F. D'Souza**, Wichita State University, e-mail: Francis.DSouza@wichita.edu; **S. Fukuzumi**, Osaka University, e-mail: fukuzumi@chem.eng.osaka-u.ac.jp; **D. M. Guldi**, Friedrich-Alexander-Universität Erlangen-Nürnberg, e-mail: dirk.guldi@chemie.uni-erlangen.de; and **O. Ito**, Institute of Multidisciplinary Research for Advanced Materials, e-mail: ito@tagen.tohoku.ac.jp.

H2

## Molecular and Supramolecular Chemistry of Fullerenes and Carbon Nanotubes

### Fullerenes, Nanotubes, and Carbon Nanostructures

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

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

H3

## Carbon Nanotubes and Nanostructures: Fundamental Properties and Processes

### Fullerenes, Nanotubes, and Carbon Nanostructures

This is one of two related symposia on carbon nanotubes and related materials. This symposium will be focused on fundamental properties and processes in physics, chemistry, and materials science. Topics may include methods for

sample preparation and characterization; mechanical, thermal, optical, and electronic properties; chemical and electrochemical behavior; and theoretical studies.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **R. Weisman**, Rice University, e-mail: weisman@rice.edu; **J. Li**, NASA Ames Research, e-mail: jingli@mail.arc.nasa.gov; and **M. Zheng**, DuPont, e-mail: ming.zheng@usa.dupont.com.

H4

## Carbon Nanotubes and Nanostructures: Applications and Devices

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

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

**An issue of *ECS Transactions* may be published "AFTER" the meeting. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 2, 2008. All manuscripts will be submitted online, and must be in either MS Word or PDF format.**

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **S. Rotkin**, Lehigh University, e-mail: rotkin@lehigh.edu; **M. Heben**, NREL, e-mail: michael\_heben@nrel.gov; and **J. Li**, NASA Ames Research, jingli@mail.arc.nasa.gov.

H5

## Endofullerenes and Carbon Nanocapsules

### Fullerenes, Nanotubes, and Carbon Nanostructures

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

**An issue of *ECS Transactions* may be published "AFTER" the meeting. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 2, 2008. All manuscripts will be submitted online, and must be in either MS Word or PDF format.**

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

H6

## Energetics and Structure and Solid-State Physics

### Fullerenes, Nanotubes, and Carbon Nanostructures

Original research papers that address both theoretical and experimental aspects of fullerenes and carbon nanoclusters are being solicited for this symposium. The topics include quantum chemistry, topology, statistical mechanics,

molecular dynamics, thermodynamics, kinetics, thermal properties, solubility, mechanism, ionization, collisions, electronic properties, and catalysis.

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

**H7**

## Carbon Nanotubes and Nanostructures: Medicine and Biology

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

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

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **T. Da Ros**, Università di Trieste, e-mail: daros@univ.trieste.it; and **L. Wilson**, Rice University, e-mail: durango@ruf.rice.edu.

**H8**

## Porphyrins and Supramolecular Assemblies

### Fullerenes, Nanotubes, and Carbon Nanostructures

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

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

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

**H9**

## Metallic and Semiconducting Nanoparticles for Energy Conversion

### Fullerenes, Nanotubes, and Carbon Nanostructures

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

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **P. Kamat**, Notre Dame Radiation Laboratory, e-mail: pkamat@nd.edu; and **S. R. Narayan**, Jet Propulsion Laboratories, s.r.narayanan@jpl.nasa.gov.

## I — PHYSICAL AND ANALYTICAL ELECTROCHEMISTRY

**I1**

### Physical and Analytical Electrochemistry General Session

#### Physical and Analytical Electrochemistry

Papers concerning any aspect of physical electrochemistry not covered by topic areas of other specialized symposia at this meeting are welcome. Contributed papers will be programmed in some related order, depending on the titles and contents of the submitted abstracts.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **P. Trulove**, US Naval Academy, e-mail: trulove@usna.edu; and **H. De Long**, AFOSR/NL, e-mail: hugh.delong@afosr.af.mil.

**I2**

### Exploiting Magnets and Magnetic Fields in Electrochemical Systems and Devices

#### Physical and Analytical Electrochemistry / Sensor

The organizers of this symposium are soliciting papers in all areas of the use of magnets and magnetic fields in electrochemical systems. Topics may include (but are not limited to): (1.) the use of magnetic particles in electrochemical analysis and energy systems, (2.) fundamental and applied studies of magnetohydrodynamics, paramagnetic concentration gradients, and magnetic field gradients in electrochemical systems, and (3.) modeling of magnetic effects on 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 June 2, 2008. All manuscripts will be submitted online, and must be in either MS Word or PDF format.**

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **I. Fritsch**, University of Arkansas, email: ifritsch@mail.uark.edu; and **S. Minter**, Saint Louis University, email: minter@slu.edu; and **Z. Aguilar**, Vegrandis, LLC, e-mail: zapaguilar@yahoo.com.

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

**J1**

### **Sensors, Actuators, and Microsystems General Session**

#### **Sensor**

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

This symposium intends to bring together a range of interdisciplinary topics and covers all materials aspects of sensors, actuators, and microsystems. Primary emphasis will be placed upon applied aspects of the materials, synthesis, evaluation, and development strategies of novel materials/device configurations for sensing and actuating functions as well as integrated microsystems. High temperature as well as low temperature applications will be discussed. Papers are solicited in, but not limited to, the following areas: (1.) physics and chemistry of sensor and actuator materials, fabrication and characterization of novel compositions; 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; (5.) optical, RF and wireless sensors and actuators, such as fiber optic sensors, microwave sensors, optical and wireless integrations; and (6.) emerging technologies and applications; and (7.) novel techniques to expand and insure sensor stability and reliability.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **G. Hunter**, NASA Glenn Research Center, e-mail: ghunter@grc.nasa.gov; **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. Carter**, Eltron Research, Inc., e-mail: mcarter@eltronresearch.com.

**J2**

### **Acoustic Wave-Based Sensors and Sensor Systems**

#### **Sensor**

This symposium covers all aspects of sensors and micro-analytical systems that utilize acoustic waves to monitor physical, chemical and biological parameters, processes and species. Primary emphasis will be placed upon the fundamentals of the device materials, models and design, the chemistry and physics underlying sensor response, and the design and operation of micro-analytical systems utilizing acoustic wave-based sensors. Applications of these sensors and systems are also welcome, such as the utilization of novel sensing materials and un-powered devices. Sensors based on surface acoustic waves (SAWs), acoustic plate modes (APMs), Lamb waves, flexural plate modes, thickness shear modes (TSMs), quartz crystal microbalances (QCMs) and other acoustic waves are of interest. Contributions to both theoretical understanding and experimental measurements using these acoustic wave sensors are sought. Topics of interest range from preliminary studies of new sensor concepts and instrument development, through measurements of physicochemical interactions between sensors and contacting media, to practical implementation of full sensor systems incorporating these devices. Established themes include interfacial (bio)chemical and electrochemical effects, thin film materials characterization, viscoelastic phenomena, fluid monitoring, rheological measurements, device modeling, gas and vapor sensing systems, and physical measurands such as temperature, pressure, mechanical strain, and electric and magnetic fields. In addition, we seek contributions in emerging areas, including but not restricted to: new transducer materials, new device concepts and their design, micro-system fabrication and implementation, dissipation in biomolecular films, nanomaterial sensing layers, and coupling with other measurement or imaging techniques.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **V. Bhethanabotla**, University of South Florida, e-mail: venkat@eng.usf.edu; **A. R. Hillman**, University of Leicester, e-mail: arh7@leicester.ac.uk; **R. Cernosek**, Sandia National Laboratories, e-mail: rwcerno@sandia.gov; **J. Grate**, Pacific Northwest National Laboratories, e-mail: jwgrate@pnl.gov; and **D. Malocha**, University of Central Florida, e-mail: dcm@ece.engr.ucf.edu.

**J3**

### **Electrochemical Nano/Biosensors**

#### **Sensor / Organic and Biological Electrochemistry / Physical and Analytical Electrochemistry / New Technology Subcommittee**

Combination of nanotechnology and bioelectrochemistry have become a highly active research area because of its great capabilities to provide superior efficacy and miniaturization in a broad range of applications including sensors, fuel cell technology, random access memory for molecular computing, etc. Impressive examples include (i) the direct electrochemistry of the flavoenzymes conducted at SWNT-modified Au electrodes for biosensing, and (ii) the direct electron transfer between the active site of glucose oxidase and multi-walled carbon nanotube-modified electrode surface for a biofuel cell.

This symposium will continue the success of previous symposia to bring together researchers from academia

and industry, to present and discuss recent work in nanobiosensors. Although electrochemical platform-based systems are in the prime interest, papers are solicited on all aspects of biosensor systems. You are invited to discuss novel concepts and ideas in nanotechnology-based sensor research as well as applications of sensors in biomedical, food safety, agriculture and other areas.

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**2008. All manuscripts will be submitted online, and must be in either MS Word or PDF format.**

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **A. Simonian**, Auburn University, e-mail: als@eng.auburn.edu; **Z. Aguilar**, Vegrandis, LLC, e-mail: zapaguilar@yahoo.com; **M. Bayachou**, Cleveland State University, email: m.bayachou@csuohio.edu; **H. De Long**, AFOSR/NL, e-mail: hugh.delong@afosr.af.mil.; and **P. Hesketh**, Georgia Institute of Technology, e-mail: peter.hesketh@me.gatech.edu.

## Young Faculty Travel Grant Application | ECS Phoenix, AZ

The Society's Battery and High Temperature Materials (HTM) Divisions offer travel grants to postdoctoral associates, junior faculty, and other young investigators presenting papers at the Society's next meeting in Phoenix AZ, May 18-23, 2008. To apply, complete this application and send it along with a copy of your CV and a letter of recommendation from an established researcher attesting both to the quality of the applicant's work and financial needs, and a copy of the applicant's meeting abstract. For additional information please contact the Division contact below, as requirement might differ between Divisions.

Meeting Site: \_\_\_\_\_

Name: \_\_\_\_\_

Organization: \_\_\_\_\_

Address: \_\_\_\_\_

E-mail: \_\_\_\_\_ Phone #: \_\_\_\_\_

Symposium Title (#): \_\_\_\_\_

\_\_\_\_\_

Title of paper to be presented at the meeting: \_\_\_\_\_

\_\_\_\_\_

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: B. Y. Liaw, University of Hawaii Natural Energy Institute, 1680 East-West Road, Post 109, Honolulu, HI 96822, USA. E-mail: bliaw@hawaii.edu

☐ HTM—Send to: J. Fergus, Materials Research and Education Center, 275 Wilmore Laboratories, Auburn, AL 36849, USA. E-mail: jwfergus@eng.auburn.edu

**Applications for Travel Grants for the Phoenix, AZ meeting must be received no later than December 17, 2007.**