Call for Papers

Montréal skyline from Mount Royal / Mount Royal and Surroundings, Credit : © Tourisme Montréal, Stéphan Poulin

219th ECS Meeting

Montréal

May 1-6, 2011

Palais des Congrès de Montréal — Montréal, Canada

Canada

219th ECS Meeting—Call for Papers—May 1-6, 2011

The 219th ECS Meeting will be held from May 1-6, 2011. 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 November 15, 2010.

Note: Some abstracts may be due earlier than November 15, 2010. Please carefully check the symposium listings for any alternate abstract submission deadlines. For complete details on abstract submission and symposia topics, please see www.electrochem.org.

Abstract Submission and Deadlines

Submit one original meeting abstract electronically via www.electrochem.org, no later than **November 15, 2010**. Faxed abstracts, late abstracts, and abstracts more than one page in length will not be accepted. In January 2011, all presenting authors will receive an email from ECS headquarters office notifying them of the date and time of their presentation. Only authors with non-U.S. or non-Canadian addresses 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 ideal preformatted two column template located at: http://www.electrochem.org/meetings/assets/abs_template.doc. Programming for this meeting will occur in December 2010, 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 January of 2011. Oral presentations must be in English. Both LCD projectors and Laptops will now be provided for oral presentations. **Presenting authors are no longer required to bring their own laptops to the meeting for presentation; however, you MUST bring your presentation on a USB flash drive to be used with the laptop that will be provided in each technical session room**. If a presenting author would like to use their own laptop for presentation, we strongly suggest that 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 3 feet 10 inches high by 3 feet 10 inches wide (1.17 meters high by 1.17 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 USB 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://ecsdl.org/ECST/) for additional information, including overall guidelines, deadlines for submissions and reviews, author and editor instructions, a manuscript template, and much more.

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

Financial Assistance

Financial assistance is very limited and generally governed by the symposium organizers. Individuals may inquire directly to the symposium organizers of the symposium in which they are presenting their paper to see if funding is available. Individuals requiring an official letter of invitation should write to the ECS headquarters office; such letters will not imply any financial responsibility of ECS. Students seeking financial assistance should consider awarded travel grants (see page 105).

Hotel Reservations

The 219th ECS Meeting will be held at the Palais des Congrès de Montréal located at 201 Avenue Viger Est, Montréal, Québec H2Z 1X7, Canada. Please refer to the 219th ECS Meeting site for the most up to date information on hotel availability and a block of rooms where special rates have been reserved for participants attending the 219th ECS Meeting. **The reservation deadline is April 1, 2011.** Please refer to ECS website for rates and reservations.

Meeting Registration

All participants, including authors and invited speakers of the 219th ECS Meeting, are required to pay the appropriate registration fees. Hotel and meeting registration materials will be made available in January of 2011 on the ECS website (www.electrochem.org). **The deadline for advance registration is April 1, 2011.**

Short Courses

A number of short courses will be offered on Sunday, May 1, 2011 from 9:00 AM-4:30 PM. Short Courses **require advance registration** and may be cancelled if enrollments are too low. As of press-time, the following Short Courses are planned for the meeting: Polymer Electrolyte (PE) Fuel Cells, Scientific Writing for Scientists and Engineers, Basic Electrochemical Measurements, Fundamentals of Electrodeposition, and Grid Scale Energy Storage. Please check the ECS website for the final list of offerings.

Technical Exhibit

The 219th 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 $2,000 and include one free meeting registration. Literature display tables (unmanned by company representatives; no meeting registration included) will also be available for $1,000. Parties interested in exhibiting should contact Tim Fest at the ECS headquarters office for more information. Coffee breaks are scheduled each day in the exhibit hall along with evening poster sessions to increase traffic.

Sponsorship Opportunities

ECS biannual meetings are wonderful chances to market your company through sponsorship. Sponsors will be recognized by level in Interface, the Meeting Program, the Exhibit Guide, Meeting Signage, and on the ECS website. The Levels are: Platinum: $5,000+, Gold: $2,500+, Silver: $1,000+, and Bronze: $500.

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.

Advertising opportunities—in the meeting program as well as in *Interface*—are available. For more information on any sponsorship opportunity, contact Tim Fest at ECS headquarters.

Contact Information

If you have any questions or require additional information, contact The Electrochemical Society, 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 — Nanotechnology General Session

A3 — Electrochemistry and Climate Change

A4 — Tutorials in Nanotechnology: Focus on Dielectrics in Nanosystems

B Batteries, Fuel Cells, and Energy Conversion

B1 — Batteries and Energy Technology Joint General Session

B2 — Direct Alcohol Fuel Cells

B3 — Electrolytes for High Voltage Cathodes – Solids and Liquids

B4 — Metal/Air, Metal/Sulfur, and Metal/Water Batteries

B5 — Microstructure, Mechanisms, and Modeling of Battery Materials

B6 — Nanostructured Materials for Energy Storage and Conversion

B7 — Solid Oxide Fuel Cells XII (SOFC XII)

C Biomedical Applications and Organic Electrochemistry

C1 — Organic and Biological Electrochemistry General Poster Session

C2 — Recent Progress in Synthetic and Mechanistic Organic Electrochemistry

C3 — Reactive Ion Radical Intermediates

D Corrosion, Passivation, and Anodic Films

D1 — Corrosion General Session

E Dielectric and Semiconductor Materials, Devices, and Processing

E1 — Silicon Compatible Materials, Processes, and Technologies for Advanced Integrated Circuits and Emerging Applications

E2 — Bioelectronics, Biointerfaces, and Biomedical Applications 4

E3 — Graphene, Ge/III-V, and Emerging Materials for Post-CMOS Applications 3

E4 — Nanocrystal Embedded Dielectrics for Electronic and Photonic Devices

E5 — Organic Semiconductor Materials, Devices, and Processing 3

E6 — Processes at the Semiconductor Solution Interface 4

E7 — Silicon Nitride, Silicon Dioxide, and Emerging Dielectrics 11

E8 — Advanced Semiconductor-on-Insulator Technology and Related Physics 15

E9 — Wide Bandgap Semiconductor Materials and Devices 12

E10— Plasma Processing 18

F Electrochemical / Chemical Deposition and Etching

F1 — Electrodeposition for Energy Applications 2

F2 — Surfactant and Additive Effects on Thin Film Deposition and Particle Growth 2

G Electrochemical Synthesis and Engineering

G1 — Industrial Electrochemistry and Electrochemical Engineering General Session

G2 — Characterization of Porous Materials 3

G3 — Electrosynthesis and Electrochemical Processes, in Honor of W. Ves Childs

G4 — Multi-scale Modeling of Electrochemical Systems 4

H Fullerenes, Nanotubes, and Carbon Nanostructures

H1 — Electron Transfer and Applications of Fullerenes and Nanostructured Materials

H2 — Molecular and Supramolecular Chemistry of Fullerenes and Carbon Nanotubes

H3 — Carbon Nanotubes and Nanostructures: Fundamental Properties and Processes

H4 — Carbon Nanotubes and Nanostructures: Applications and Devices

H5 — Endofullerenes and Carbon Nanocapsules

H6 — Energetics and Structure and Solid-State Physics

H7 — Carbon Nanotubes and Nanostructures: Medicine and Biology

H8 — Porphyrins and Supramolecular Assemblies

H9 — Nanostructures for Energy Conversion

H10— Chemistry and Physics of Graphene and 2D Nanostructures

H11— Chemistry, Physics, and Applications of Graphene (Graphenes, Nanotubes, and Carbon Nanostructures)

I Physical and Analytical Electrochemistry

I1 — Bioelectrocatalysis

I2 — Charge Transfer Processes in Biological Systems

I3 — Computational Electrochemistry

I4 — Electrocatalysis 5

I5 — Grahame Award Symposium and Physical and Analytical Electrochemistry General Session

I6 — Nanostructured and Functionalized Electroactive Polymer Films and Related Materials 2

J Sensors and Displays: Principles, Materials, and Processing

J1 — Sensors, Actuators, and Microsystems General Session

J2 — Sensors for Harsh Environments

J3 — Sensors for Biomedical Applications

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. Cash prizes will be given to the presenting student author on each winning paper; the amounts are awarded at the discretion of the organizers and judges. The awards will be made without regard to gender, citizenship, race, or financial need.

An issue of *ECS Transactions* is planned to be published "AFTER" the meeting. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 10, 2011. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **V. R. Subramanian**, Washington University, e-mail: vsubramanian@wustl.edu; **V. Chaitanya**, New Mexico State University, e-mail: vimalc@nmsu.edu; and **K. Sundaram**, Univ. of Central Florida, e-mail: sundaram@mail.ucf.edu.

A2 Nanotechnology General Session (All Divisions and New Technology Subcommittee)

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 for electrochemistry applications. Papers are solicited in all areas related to materials including metals, ceramics, semiconductors, molecular electronics, and organic compounds and polymers, and to devices including molecular/nano electronics, chemical and biological sensors, and actuators.

Areas of interest include: semiconductor and metal nanoparticles and metal/semiconductor nanocomposites; size quantization effects in semiconductor nanoparticles; fundamentals of nucleation and growth of nanoparticles/nanowires/nanotubes; 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.

An issue of *ECS Transactions* is planned to be published "AFTER" the meeting. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 10, 2011. 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: **W. Mustain**, University of Connecticut, e-mail: mustain.edu; mustain@engr.uconn.edu; and **E. Traversa**, International Research Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science (NIMS), Tsukuba, Japan, e-mail: traversa.enrico@nims.go.jp.

A3 Electrochemistry and Climate Change (All Divisions)

This symposium targets electrochemical and solid-state research that leads to a better understanding of climate change effects and technologies to mitigate them. The symposium seeks to bring together scientists and engineers from different perspectives to share their research results, concerns, arguments, and solutions regarding this pressing problem. Presentations are solicited that describe relevant research advances in chemical analysis, energy technology, and environmental remediation. Topics of interest include chemical sensing in the environment (*e.g.* atmosphere, water, or earth), energy scavenging, conversion and storage, fuel and biofuel cells, electrocatalysis, solar energy conversion, electrochemical and photoelectrochemical conversion of carbon dioxide and other greenhouse gases, and related topics. Both experimental and theoretical studies are welcomed.

A hard-cover issue of *ECS Transactions* is planned to be available "AFTER" the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than January 21, 2011. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **S. E. Creager**, Clemson University, e-mail: screage@clemson.edu; **I. Fritsch**, University of Arkansas, e-mail: ifritsch@mail.uark.edu; and **N. Sridhar**, DNV Research & Innovation USA, e-mail: narasi.sridhar@dnv.com.

A4 Tutorials in Nanotechnology: Focus on Dielectrics in Nanosystems (All Divisions)

This symposium will feature invited talks on nano-systems with an emphasis on emerging dielectrics. Presentations at this meeting will cover (1.) nanotechnology applications in information technology, biotechnology, and renewable energy; (2.) beyond CMOS device structures and properties of semiconductor nano-devices such as nanowires; (3.) nanosystem fabrication and processing; (4.) nanostructures in chemical and biological sensing system for healthcare and security; (5.) characterization of nanosystems; and (6.) nanosystem modeling.

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 January 21, 2011. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizer: **D. Misra**, New Jersey Institute of Technology, e-mail: dmisra@njit.edu.

B — Batteries, Fuel Cells, and Energy Conversion

B1 Batteries and Energy Technology Joint General Session
(Battery / Energy Technology)

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* is planned to be published "AFTER" the meeting. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 10, 2011. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **M. Smart**, Jet Propulsion Laboratory, e-mail: marshall.c.smarts@jpl.nasa.gov; **P. Kumta**, University of Pittsburgh, e-mail: pkumta@pitt.edu; **A. Manivannan**, U.S. DOE/NETL, e-mail: manivana@netl.doe.gov, and **S. R. Narayan**, Jet Propulsion Laboratory, e-mail: s.r.narayanan@jpl.nasa.gov.

B2 Direct Alcohol Fuel Cells
(Physical and Analytical Electrochemistry / Energy Technology)

Fuel cells based on direct oxidation alcohols and other organic substances such as formic acid, dimethylether, and ethylene glycol have shown great promise as high energy density power sources. This symposium invites contributions to the understanding of the performance and design of such power sources. Presentations are sought in the areas of understanding surface processes at the anode, electrocatalytic materials, analysis of oxidation products, poisoning of electrodes and cell materials, effect of electrode and membrane materials on cell efficiency, and factors affection performance characteristics of systems. Papers based on fuel cells that require fuel processing or high temperature solid oxide electrolytes will not be accepted for this symposium.

An issue of *ECS Transactions* is planned to be published "AFTER" the meeting. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 10, 2011. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **S. R. Narayan**, Jet Propulsion Laboratory, e-mail: narayan@jpl.nasa.gov; and **T. Zawodzinski**, Oak Ridge National Laboratory, e-mail: zawodzinskit@ornl.gov.

B3 Electrolytes for High Voltage Cathodes – Solids and Liquids
(Battery)

Several challenges remain which hinder the incorporation of Li and Li-ion batteries in commercial applications such as in plug-in hybrid electric vehicles (PHEVs) – in particular, cost, cycle/calendar life, abuse tolerance, and low/high temperature operation, with the former two being the greatest hurdles. One method for decreasing the overall cost is to increase the energy density of the battery by using low-cost, high voltage cathodes against standard anodes, thus enabling fewer batteries in the PHEV battery pack. Cathode materials with much improved capacity over $LiCoO_2$ and $LiFePO_4$ have been identified (such as NMC or $LiN_{1/3}Mn_{1/3}Co_{1/3}O_2$), but such cathodes require electrolytes stable to 4.3 V or higher (NMC has a capacity of ~170 mAh/g if cycled to 4.3 V and >200 mAh/g if cycled to 4.5 V and higher). The SEI layer may be crucial to achieving electrolytes suitable for such cathodes and the use of additives may be key to the formation and the stability of such SEI layers. The SEI is also a critical factor in thermal stability at higher temperature and the low temperature impedance which limits the practical operating temperature of the battery. This symposium will focus on both fundamental and applied aspects of high-voltage electrolyte research for Li and Li-ion batteries. Topics of interest therefore include, but are not restricted to, new solvents and salts; additives for reduced flammability and improved SEI formation; ionic liquids; and studies which advance the understanding of electrode/electrolyte interfacial phenomena.

An issue of *ECS Transactions* is planned to be published "AFTER" the meeting. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 10, 2011. 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: **F. Alamgir**, Georgia Institute of Technology, faisal.alamgir@mse.gatech.edu; **W. Henderson**, North Carolina State University, e-mail: whender@ncsu.edu; and **J. Yamaki**, Kyushu University, e-mail: yamaki@cm.kyushu-u.ac.jp.

B4 Metal/Air, Metal/Sulfur, and Metal/Water Batteries
(Battery / Energy Technology)

Metal/air, metal/sulfur, and metal/water batteries possess very high theoretical energy densities and are potentially attractive for a variety of applications. Yet various technical obstacles have hindered their development and kept their potential advantages far from being fully utilized, despite the fact that some systems such as zinc/air batteries with aqueous alkaline electrolytes have long been commercialized for certain niche applications. In recent years there has been a renewed interest in these batteries and various new approaches and designs, as well as new materials have been or are being developed. This symposium covers all aspects of metal/air and metal/water batteries.

Topics of interest include but are not limited to: (1.) catalysts for the air electrode and bi-functional catalysts; (2.) design of the air electrode; (3.) anode passivation and kinetics and design of the anode; (4.) design of sulfur electrode and effect of shuttle reactions; (5.) system design; (6.) non-aqueous and polymer electrolytes, and ionic liquids, and batteries based on them; (7.) primary and rechargeable systems; and (8.) applications of metal/air, metal/sulfur, and metal/water batteries.

An issue of *ECS Transactions* is planned to be published "AFTER" the meeting. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 10, 2011. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Y. Shao-Horn**, Massachusetts Institute of Technology, e-mail: shaohorn@mit.edu; **H. Arai**, Kyoto University, e-mail: h-arai@saci.kyoto-u.ac.jp; **N. Dudney**, Oak Ridge National Laboratory, e-mail: dudneynj@ornl.gov, and **T. Fuller**, Georgia Tech, e-mail: tom.fuller@gtri.gatech.edu.

B5 Microstructure, Mechanisms, and Modeling of Battery Materials
(Battery)

Recently many new diagnostic and modeling approaches have been developed and applied to advanced batteries. These techniques, together with more traditional techniques that have been applied in novel ways, are providing new insights into fundamentals of operation, control, and failure of Li batteries. Examples of new types of data include *in situ* and *ex situ* microscale data, in up to three dimensions, at interfaces and within active particles, as functions of state of charge and life history of battery materials. Modeling methods capturing atomic details and material microstructures are bringing new insights to battery mechanisms. The combination of experiments and modeling is providing a greatly improved understanding of structure-material-property relationships at the macro, micro, and nano scales. The goal of this symposium is to foster these new approaches in order to better understand battery mechanisms, which will enable new predictive modeling methods for battery performance, control, and life and as well as new battery materials and architectures.

This symposium will include but not be limited to papers that develop and apply these approaches to elucidate microstructure and fundamental chemical and physical mechanisms that can inform improved models of battery performance and life. Communications on new research opportunities offered by emerging instrumentation and methods are sought.

An issue of *ECS Transactions* is planned to be published "AFTER" the meeting. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 10, 2011. 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. Harris**, General Motors R&D, email: stephen.j.harris@gm.com; and **Y. Qi**, General Motors R&D, email: yue.qi@gm.com.

B6 Nanostructured Materials for Energy Storage and Conversion
(Energy Technology / Industrial Electrochemistry and Electrochemical Engineering / Battery / Electrodeposition)

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

This symposium will focus on nanostructured materials in the area of electrochemical, energy storage and conversion in the area of batteries, (Li-ion, metal-air, metal-water) and supercapacitors, intercalation anodes and cathodes, nanocomposite polymers, and metal hydrides. Topics of interest in the general area of fuel cells including catalyst of electro-oxidation of hydrogen, reformat and organic fuels, catalysts for oxygen reduction, supported and unsupported materials, polymer electrolyte for PEM and solid oxide fuel cells.

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 10, 2011. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **K. Zaghib**, Institut de Recherche d'Hydro-Québec (IREQ), e-mail: zaghib.karim@ireq.ca; W. Chiu, University of Connecticut, e-mail: wchiu@engr.uconn.edu; **C. Julien**, Université P et M. Curie, e-mail: cjul@ccr.jussieu.fr; **W. Mustain**, University of Connecticut, e-mail: mustain.edu; mustain@engr.uconn.edu; **V. Ramani**, Department of Chemical and Environmental Engineering, Illinois Institute of Technology, e-mail: ramani@iit.edu; and **W. van Schalkwijk,** EnergyPlex Corp, e-mail: walter@energyplex.com.

B7 Solid Oxide Fuel Cells XII (SOFC XII)
(High Temperature Materials / Battery / Energy Technology / SOFC Society of Japan)

This twelfth symposium (SOFC XII) will provide an international forum for the presentation and discussion of the latest developments on solid oxide fuel cells (SOFCs) and related topics. Papers are solicited on all aspects of solid oxide fuel cells. Following is a partial list of topics to be addressed: (1.) materials for cell components (*e.g.* electrolyte, electrodes, interconnection, and seals); (2.) fabrication methods for cell components, complete cells, and stacks; (3.) cell designs, electrochemical performance, and modeling; (4.) stack designs and their performance; (5.) utilization of different fuels with or without reformation; (6.) stationary power generation, transportation, and military applications; and (7.) prototype SOFC systems, field test experience, cost, and commercialization plans.

An issue of *ECS Transactions* is planned to be available "AT" the meeting, in both USB drive and CD-ROM formats (packaged together to replace the traditional hardcover edition). All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than January 7, 2011. All manuscripts will be submitted online, and must be in MS Word to allow editors to make minor formatting/editorial changes. A failure to submit a full text paper to *ECS Transactions* will result in the withdrawal of the corresponding presentation.

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **S. C. Singhal**, Pacific Northwest National Laboratory, e-mail: singhal@pnl.gov; and **K. Eguchi**, Kyoto University, e-mail: eguchi@scl.kyoto-u.ac.jp.

C — Biomedical Applications and Organic Electrochemistry

C1 Organic and Biological Electrochemistry General Poster Session
(Organic and Biological Electrochemistry)

Submissions are solicited in all area of organic, organometallic, and biological electrochemistry. Areas of interest include synthetic and mechanistic electrochemistry with industrial and educational applications involving fuel cells, batteries, sensing, and fundamental studies.

An issue of *ECS Transactions* is planned to be published "AFTER" the meeting. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 10, 2011. All manuscripts will be submitted online, and must be in either MS Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizer: **J. Burgess**, Case Western Reserve University, e-mail: jdb22@case.edu.

C2 Recent Progress in Synthetic and Mechanistic Organic Electrochemistry
(Organic and Biological Electrochemistry)

The symposium will deal with all aspects of organic electrochemistry. Papers are solicited on anodic oxidations and cathodic reductions of organic substrates, organometallic electrochemistry and the role of metals in organic electrode reactions, mechanistic investigations, modified electrodes, electrochemistry in unusual media, asymmetric organic electrosynthesis, direct and indirect electrode processes, electrode materials, and all related areas.

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Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **T. Fuchigami**, Department of Electronic Chemistry, Tokyo Institute of Technology, e-mail: fuchi@echem.titech.ac.jp; **G. T. Cheek**, Department of Chemistry, United States Naval Academy, e-mail: cheek@usna.edu; and **A. Fry**, Department of Chemistry, Wesleyan University, e-mail: afry@wesleyan.edu.

C3 Reactive Ion Radical Intermediates
Organic and Biological Electrochemistry)

Papers are solicited for a symposium covering all aspects of ion radical chemistry. This includes physical studies, synthetic applications, biological intermediates, organometallics, and the use of ion radicals as mediators.

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Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **K. D. Moeller**, Washington University, St. Louis, e-mail: moeller@wuchem.wustl.edu; and **A. Fitch**, Loyola University, Chicago, e-mail: afitch@luc.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 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.

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Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizer: **S. Fujimoto**, Osaka University, e-mail: fujimoto@mat.eng.osaka-u.ac.jp.

E — Dielectric and Semiconductor Materials, Devices, and Processing

E1 Silicon Compatible Materials, Processes, and Technologies for Advanced Integrated Circuits and Emerging Applications
(Electronics and Photonics / Dielectric Science and Technology)

This symposium will focus on emerging materials, processes and technologies that can be applied to large area silicon wafers either to enhance the performance of analog and digital integrated circuits or to enable revolutionary device structures with entirely new functionalities.

Topics of particular interest include: (1.) Materials and processes needed to realize advanced transistor structures with high mobility channels based on either strain engineering or emerging high-mobility channel materials such as strained Si, compound semiconductors, and graphene that can be synthesized on large area silicon wafers by epitaxial or other innovative methods. Papers focusing on synthesis of the new channel materials as well as processes that are essential for the realization of successful device structures are of particular interest. Examples include high performance gate stacks and low-resistivity junctions and contacts formed on new, silicon compatible materials. The symposium also invites abstracts on new materials and processes for 3D (TSV) integration. (2.) Synthesis of nanostructures including wires, pores, and membranes of silicon compatible materials as well as novel MEMS/NEMS structures and their integration with the mainstream silicon integrated circuit technology. Abstracts on applications of these new devices in all relevant fields including electronics, optics, and biology are welcome. (3.) New technologies and equipment for synthesis and characterization of the materials and processes listed above.

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 January 21, 2011. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

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

E2 Bioelectronics, Biointerfaces, and Biomedical Applications 4
(Dielectric Science and Technology / Electronics and Photonics Division / Sensor)

This symposium is intended to bring together scientists and technologists working at the forefront of chemistry, physics, biology, and materials science to focus on the critical aspects of the interfaces in biomedical devices and their applications. It will provide invaluable links between those investigating and characterizing the basic chemical, physical, and biological phenomena and those developing the latest biomedical

applications. The emphasis will be on novel work that involves electrical measurements and modeling on structures with reduced dimensions (quantum wires and quantum dots); innovations in immunosensing; innovative use of optical sensing techniques (SERS, SPR, and interferometry); sample preparation for molecular diagnostics; gas sensing of volatile organic compounds; and responsive drug delivery.

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Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **M. Madou**, University of California-Irvine, e-mail: mmadou@uci.edu; **S. Daunert**, University of Kentucky-Lexington, e-mail: daunert@uky.edu; **A. Hoff**, University of South Florida, e-mail: hoff@eng.usf.edu; **D. Landheer**, National Research Council, Canada, e-mail: dolf.landheer@nrc.ca; **L. Nagahara**, National Cancer Institute, USA, e-mail: nagaharl@mail.nih.gov; **A. Offenhaeusser**, ISG2 - Research Center Juelich, e-mail: a.offenhaeusser@fz-juelich.de; **K. Sode**, Tokyo University of Agriculture and Technology, e-mail: sode@cc.tuat.ac.jp; **T. Thundat**, Oak Ridge National Lab, e-mail: thundattg@ornl.gov; and **C. Wang**, Florida International University, e-mail: wangc@fiu.edu.

E3 Graphene, Ge/III-V, and Emerging Materials for Post-CMOS Applications 3
(Dielectric Science and Technology)

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

Papers will be solicited in the following areas: (1.) emerging research materials science and technology; (2.) emerging research materials processing and modeling; (3.) emerging research materials and process integration issues; (4.) emerging research materials related defect detection and characterization; (5.) electrical characterization of emerging research materials; (6.) ESH of emerging research materials; and (7.) inntroduction to "More than Moore" and "Beyond CMOS" integration schemes/technology.

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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. Karim**, AIXTRON, e-mail: zkarim@genus.com; **S. De-Gendt,** IMEC, Stefan.Degendt@chem.kuleuven.be; **D. Misra**, New Jersey Institute of Technology, e-mail: dmisra@njit.edu; **Y. Obeng**, NIST, e-mail: yaw.obeng@nist.gov; and **P. Srinivasan**, Texas Instruments, psrinivasan@ti.com.

E4 Nanocrystal Embedded Dielectrics for Electronic and Photonic Devices
(Dielectric Science and Technology / Electronics and Photonics)

This symposium will address the science and technology of nanocrystals—both of elemental and compound semiconductors—embedded in dielectric films and structures, with emphasis on applications in electronics and photonics. Research fields of interest are related but not necessarily limited to the following topics: (1.) fabrication of nanocrystalline structures: deposition processes, implantation protocols, annealing strategies; (2.) characterization of nanocrystals: optical and electrical characteristics, photo- and 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.

An issue of *ECS Transactions* is planned to be published "AFTER" the meeting. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 10, 2011. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **P. Mascher**, McMaster University, e-mail: mascher@mcmaster.ca; **P. Joshi**, LCD Process Technology Laboratory, Sharp Laboratories of America, Inc., e-mail: pjoshi@sharplabs.com; **M. E. Overberg**, Sandia National Laboratories, e-mail: meoverb@sandia.gov; and **Y. Kuo**, Thin Film Nano & Microelectronics Research Lab, e-mail: yuekuo@tamu.edu.

E5 Organic Semiconductor Materials, Devices, and Processing 3
(Electronics and Photonics / Dielectric Science and Technology)

This will be the third symposium in this series and the objective is to link processing and materials studies to devices and technological applications. The symposium will cover a wide range of topics related to broadly understood science and technology of organic/polymeric semiconductor materials, processes, devices and applications.

Topics of interest include, but is not limited to, the following: (1.) chemistry of organic semiconductors and its impact on material and device characteristics; organic and polymer semiconductors; (2.) physical phenomena underlying operation of organic/polymeric semiconductor devices; (3.) deposition methods: PVD, solution processing, printing, and 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: light emitting diodes and 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, and reproducibility of device characteristics.

To be considered for inclusion into the symposium program, a one-page abstract must be submitted electronically to ECS by the **DEADLINE**. A copy of the abstract must also be submitted to the lead symposium organizer, Jamal Deen,

and be accompanied by a cover letter with full contact details of the presenting author. 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. All submitted abstracts will be peer-reviewed. Any additional information can be obtained from the symposium organizers listed below.

An issue of *ECS Transactions* is planned to be published "AFTER" the meeting. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 10, 2011. 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: **M. Jamal Deen,** McMaster University, e-mail: jamal@mcmaster.ca; **D. Gundlach,** National Institute of Standards and Technology, Semiconductor Electronics Division, e-mail: David. Gundlach@NIST.gov; **B. Iniguez,** Department of Electronic Engineering, Universitat Rovira i Virgili, e-mail: benjamin. iniguez@urv.cat; and **H. Klauk,** Max Planck Institute for Solid State Research, e-mail: H.Klauk@fkf.mpg.de.

E6 Processes at the Semiconductor Solution Interface 4
(Electronics and Photonics / Energy Technology)

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

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

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

E7 Silicon Nitride, Silicon Dioxide, and Emerging Dielectrics 11
(Dielectric Science and Technology)

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

Key topics of interest in the broad areas of silicon dioxide, silicon nitride, and emerging dielectrics including organic, high-k and low-k layers, films for applications in flexible electronics, sensors, displays, solar cells, smart cards, MEMS, and bio-technology, and includes the following. (1.) growth and deposition (thermal CVD, PECVD, sputtering, ion implantation, thermal nitridation and oxidation, atomic layer deposition, MOCVD, PVD etc.); (2.) film characterization (IR spectroscopy, photoluminescence, RBS, NRA, SIMS, AES, XPS, AFM, TEM, EPR, NMR, ellipsometry, novel characterization, and analytical techniques); (3.) porosity, mechanical, electrical, chemical, physical, and optical properties; (4.) plasma and non-plasma process-induced damage: mechanism, reduction, and recovery; (5) adhesion and substrate-film interactions; (6.) degradation: NBTI, PBTI, radiation, and hot-carriers; (7.) dielectric breakdown, failure, and reliability related to process integration; (8.) mathematical, physical, and computational modeling; (9.) strained layers and relaxed defect formation; (10.) defect and charge carriers: passivation, charge transport, trapping and de-trapping, characteristic of traps, and tunneling; (11.) films for semiconductors memories, especially for gigabit generations; (12.) insulating films for compound semiconductor devices (interlevel dielectric, topcoat, capacitor dielectric, surface passivation, interfaces, dielectrics dependent electrical and optical properties of devices); (13.) dielectrics used for photonic applications; (14.) multi-layer dielectric stacks; (15.) plasma science and plasma processing technology for thin films; (16.) isolation techniques including PBL, SEG, doped glasses; and (17.) plasma etching and CMP of dielectrics.

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Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **R. Ekwal Sah**, Fraunhofer Institute for Applied Solid State Physics, e-mail: sah@iaf.fhg.de; **J. Zhang**, Liverpool John Moores University, e-mail: j.f.zhang@ljmu.ac.uk; **M. Jamal Deen**, McMaster University, e-mail: jamal@mcmaster.ca; **A. Toriumi**, The University of Tokyo, e-mail: toriumi@material.t.u-tokyo.ac.jp; **D. Bauza**, CNRS/IMEP/Minatec-INPG, Email: bauza@enserg.fr; and **S. W. King**, Intel, e-mail: sean.king@intel.com.

Technical Program Committee: **P. C. Joshi**, Sharp Laboratories of America, Inc., e-mail: pjoshi@sharplabs.com; **P. Srinivasan**, Texas Instruments, e-mail: psrinivasan@ti.com; and **R. Todi**, Semiconductor Research and Development Center, IBM Microelectronics, e-mail: rmtodi@us.ibm.com.

E8 Advanced Semiconductor-on-Insulator Technology and Related Physics 15
(Electronics and Photonics)

This historical symposium is renamed and will restart in 2011. The symposium covers recent significant advances in SOI technologies, SOI-based nanoelectronics and innovative applications including scientific interests. It will be of interest

to materials and device scientists, as well as to process and applications oriented engineers and scientists. Theoretical and experimental contributions are solicited.

Specific topics will include, but are not limited to: (1.) synthesis of advanced semiconductor-on-insulator (SOI) wafers and materials evaluation, including strained layers on insulator and SOI-like heterostructures formed by bonding, wafer screening, electrical properties, defect and stress identification, interface quality, properties of ultra-thin films and buried oxides, tools for quality control; (2.) SOI MOSFETs, high performance CMOS and bipolar devices: process integration, low power/voltage and *RF* circuits, memories, high power/voltage devices, high/low temperature devices; and (3.) innovative devices: ultra-thin-BOX FD-SOI MOSFETs, FinFETs and various multiple-gate devices, quantum and tunneling transistors, photonic SOI devices, optical interconnects, various intelligent sensors and MEMS/NEMS, etc. Each session will be introduced by keynote speakers and a special session for students will be planned.

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Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Y. Omura**, Kansai University, e-mail: e-mail: omuray@ipcku.kansai-u.ac.jp; **F. Gámiz**, University of Granada, e-mail: fgamiz@ugr.es; **H. Ishii**, Toyohashi University of Technology, e-mail: ishii@ee.tut.ac.jp; **J. A. Martino**, University of Sao Paulo, Brazil, e-mail: martino@lsi.usp.br; **B-Y Nguyen,** SOITEC/USA, e-mail: Bich-yen.Nguyen@soitecusa.com; **J-P Raskin**, Université Catholique de Louvain, e-mail: jean-pierre.raskin@uclouvain.be; **S. Selberherr**, Technische Universität Wien, e-mail: Selberherr@TUWien.ac.at.

E9 Wide Bandgap Semiconductor Materials and Devices 12
(Electronics and Photonics / Sensor)

This symposium will focus on issues pertinent to development of wide-bandgap semiconductor materials and devices, encompassing inorganic wide-bandgap semiconductors: III-nitrides (*e.g.* gallium nitride), II-oxides, SiC, diamond, II-VI, and also emerging materials such as hybrid organic-inorganic and nanoscale structures.

The following six technical areas are of particular interest: (1.) light emitting devices, especially in the challenging wavelength ranges of the "deep green" 555-585 nm and the "deep ultraviolet" shorter than 300 nm; (2.) optical detectors: especially novel materials and devices for photovoltaic energy conversion; (3.) high temperature, high power, and high frequency electronics; (4.) sensor applications, especially environmental sensors; (5.) device development on alternative substrates: including GaN, AlN, and ZnO; and (6.) materials characterization: nanoscale imaging, defect structure, and luminescence. The purpose is to bring together wide-bandgap crystal growth, materials processing, device design, and application researchers to review current issues in wide bandgap semiconductors. This symposium will consist of both invited and contributed papers and posters.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **J. A. Bardwell**, National Research Council of Canada, e-mail: jennifer.bardwell@nrc.ca; **J. D. Caldwell**, U.S. Naval Research Laboratory, e-mail: joshua.caldwell@nrl.navy.mil; **G. W. Hunter**, NASA Glenn Research Center, e-mail: ghunter@grc.nasa.gov; **Z. Mi**, McGill University, e-mail: zetian.mi@mcgill.ca; **E. B. Stokes**, University of North Carolina at Charlotte, e-mail: ebstokes@uncc.edu; and **C. Wetzel**, Rensselaer Polytechnic Institute, e-mail: wetzel@rpi.edu.

E10 Plasma Processing 18
(Dielectric Science and Technology / Electronics and Photonics)

Due to the propagation of plasma applications into almost all areas of science and technology, the scope of the symposium has been expanded to all applications of low temperature plasmas. As always, papers will be solicited on recent advances of the traditional plasma applications of etching and patterning electronic materials in microelectronics, optoelectronics, MEMS, and 3D integration approaches targeting homogeneous and heterogeneous integration by chip stacking. The symposium will also cover plasmas applied to modification of functional surfaces. This will include but will not be limited to surface conditioning, cleaning, activation, and passivation of both organic and inorganic semiconductor and non-semiconductor materials, such as auto parts, textiles, and textiles.

In addition, papers will now be solicited in non-semiconductor applications of plasmas such as plasmas used in mechanical engineering, health care, surgery, densification of nuclear waste, underwater welding, and decontamination of materials after exposure to chemical-biological weapons, etc.

The new scope of the Plasma Symposium will cover all aspects of the use of plasmas including diverse applications, plasma chemistries and processes, plasma reactor design and materials, reaction mechanisms, plasma damage, and environmental aspects such as process gas abatement. The initial Plasma Processing Symposium that includes the extended scope will be at the Montreal Meeting. Renowned experts will be invited to provide insight into their exciting work in the various fields of plasma applications in traditional and non-traditional areas.

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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@infineon.com; and **D. W. Hess**, Georgia Institute of Tech., e-mail: dennis.hess@chbe.gatech.edu.

F — Electrochemical / Chemical Deposition and Etching

F1 Electrodeposition for Energy Applications 2
(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.) deposition of the semiconductor thin films; (2.) epitaxial growth and superlattices; (3.) semiconductor and metal nanodots; (4.) electrochemical insertion and intercalation reactions; (5.) light-induced deposition processes; (6.) template-assisted deposition; (7.) deposition of solar cell window materials and anti-reflection coatings; (8.) semiconductor, metal, and superconductor nucleation and growth and other mechanistic aspects; *in situ* and *ex situ* experimental methods for monitoring the deposition process; (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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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **J. L. Stickney**, University of Georgia, e-mail: stickney@chem.uga.edu; **S. R. Brankovic**, University of Houston, e-mail: Stanko.Brankovic@mail.uh.edu; **L. Deligianni**, IBM Corp, e-mail: lili@us.ibm.com; **K. Rajeshwar**, University of Texas, e-mail: rajeshwar@uta.edu; **G. Zangari**, University of Virginia, e-mail: gz3e@virginia.edu; and **S. Zou**, Miami University, e-mail: zous@MUOhio.edu.

F2 Surfactant and Additive Effects on Thin Film Deposition and Particle Growth 2

(Electrodeposition / Physical and Analytical Electrochemistry)

The influence of surfactants on the morphology and structure of materials produced by either physical or chemical means is of central importance to several evolving technologies ranging from nanoparticle synthesis by redox reactions to electroplating thin functional films. This symposium seeks to bring together researchers interested in exploring the synergies between adsorbate effects observed during particle and thin film growth by electrolytic, chemical reduction, CVD, or PVD methods. In the last decade significant capabilities for investigating the potential dependent structure and dynamics of adsorbates on single crystal surface have been established. Likewise, the impact of adsorbed anions, cations and/or molecules on the production of metal and semiconductor films and particles has been widely reported.

Taking advantage of this diverse background we will explore several questions of common interest such as: (1.) What is the correlation between adsorbate structure and particle shape or facet geometry? (2.) What is the extent of rate differentiation accessible by using different surfactants? (3.) How much anisotropy can be induced in the electrocrystallization reaction by using different adsorbates? (4.) How does potential perturbation affect the adsorbate structure and consequently impact the film growth dynamics? (5.) How is particle growth influenced by the choice of reducing agent and surfactant(s), and how does this compare to electrolytic growth at comparable potentials? (6.) How is roughness evolution influenced by surfactants? (7.) How effectively do surfactants remain segregated at growing interfaces? (8.) Why do some surfactants or additives lead to the breakdown of epitaxial growth and become incorporated in the growing solid? (9.) How do surfactants influence the deposition of alloys and compounds?

New experimental approaches for studying surfactant and additive effects are also of interest. For example, contributions describing the use of contact printing and related non-traditional patterning methods for fabricating interesting geometries as well as exploring combinatorial measurements are 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: **T. P. Moffat**, NIST, e-mail: thomas.moffat@nist.gov; and **J. A. Switzer**, University of Missouri, e-mail: jswitzer@umr.edu.

G — Electrochemical Synthesis and Engineering

G1 Industrial Electrochemistry and Electrochemical Engineering General Session

(Industrial Electrochemistry and Electrochemical Engineering)

Papers are solicited in areas of industrial 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 organizer: **G. G. Botte**, Ohio University, e-mail: botte@ohio.edu.

G2 Characterization of Porous Materials 3

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

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.

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

G3 Electrosynthesis and Electrochemical Processes, in Honor of W. Ves Childs

(Industrial Electrochemistry and Electrochemical Engineering / Physical and Analytical Electrochemistry)

This symposium is being organized to honor the memory of W. Ves Childs. His passing in 2009 was a great loss to the field of electrochemistry and to those who were touched by Dr. Childs' inquisitive scientific nature. Dr. Childs received multiple international recognitions for his work that spanned nearly four decades in electrosynthesis, reactor design and operation, and electron transfer mechanisms. Much of his focus involved tackling the complex chemical problems of electrofluorination. He played a key role in innovative and economical technology development of industrial electrochemical processes. Throughout his life, Dr. Childs engaged in community and educational activities at many levels. He continually challenged other scientists, both emerging and practicing (children and experts alike), and himself, preferably at the same time. All interested friends, colleagues, scientists, and engineers who enjoy scientific challenges are invited to submit abstracts in topics to which Dr. Childs contributed.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **J. Weidner**, University of South Carolina, e-mail: weidner@cec.sc.edu; **D. T. Mah**, Dupont, e-mail: doctor_electro@msn.com; and **I. Fritsch**, University of Arkansas, e-mail: ifritsch@mail.uark.edu.

G4 Multi-scale Modeling of Electrochemical Systems 4

(Battery / Electrodeposition / Energy Technology / Industrial Electrochemistry and Electrochemical Engineering)

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

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

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **V. R. Subramanian**, Washington University, e-mail: vsubramanian@wustl.edu; **V. Srinivasan**, Lawrence Berkeley National Laboratory, e-mail: vsrinivasan@lbl.gov; and **V. Ramani**, Illinois Institute of Technology, e-mail: ramani@itt.edu.

H — Fullerenes, Nanotubes, and Carbon Nanostructures

H1 Electron Transfer and Applications of Fullerenes and Nanostructured Materials

(Fullerenes, Nanotubes, and Carbon Nanostructures)

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

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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; and **D. M. Guldi**, Friedrich-Alexander-Universität Erlangen-Nürnberg, e-mail: dirk.guldi@chemie.uni-erlangen.de.

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: **N. Martin**, Complutense University, e-mail: nazmar@quim.ucm.es; and **J. F. Nierengarten,** Groupe de Chimie des Fullerènes et des Systèmes Conjugués, e-mail: jfnierengarten@lcc-toulouse.fr.

H3 Carbon Nanotubes and Nanostructures: Fundamental Properties and Processes
(Fullerenes, Nanotubes, and Carbon Nanostructures)

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

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **R. B. Weisman**, Rice University, e-mail: weisman@rice.edu; **S. Doorn**, Los Alamos National Lab, e-mail: skdoom@lanl.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.

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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. Rotkin**, Lehigh University, e-mail: rotkin@lehigh.edu; **Y. Gogotsi**, Drexel University, e-mail: gogotsi@drexel.edu; **J. Li**, NASA Ames Research Center, e-mail: Jing.Li-1@nasa.gov; and **R. Martel**, University of Montreal, e-mail: r.martel@umontreal.ca.

H5 Endofullerenes and Carbon Nanocapsules
(Fullerenes, Nanotubes, and Carbon Nanostructures)

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

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **L. Echegoyen**, NSF, e-mail: LECHEGOY@nsf.gov; **T. Akasaka**, University of Tsukuba, e-mail: akasaka@tara.tsukuba.ac.jp; and **A. Balch**, University of California, e-mail: albalch@ucdavis.edu.

H6 Energetics and Structure and Solid-State Physics
(Fullerenes, Nanotubes, and Carbon Nanostructures)

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

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

H7 Carbon Nanotubes and Nanostructures: Medicine and Biology
(Fullerenes, Nanotubes, and Carbon Nanostructures / Sensor)

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**, Universita di Trieste, e-mail: daros@univ.trieste.it; **Z. Aguilar**, Ocean Nano Tech, LLC, e-mail: zapaguilar@yahoo.com; **R. Bolskar**, TDA Research, e-mail: bolskar@tda.com; **L. Wilson**, Rice University, e-mail: durango@ruf.rice.edu; and **A. Hirsch** Friedrich-Alexander-Universität Erlangen-Nürnberg, e-mail: andreas.hirsch@chemie.uni-erlangen.de.

H8 Porphyrins and Supramolecular Assemblies
(Fullerenes, Nanotubes, and Carbon Nanostructures)

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

Submission of papers is encouraged in the following topics: (1.) new challenging multi-porphyrinic devices; (2.) electronic properties of porphyrinic arrays; (3.) 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; **K. Kadish**, University of Houston, e-mail: kkadish@uh.edu; and **R. Paolesse**, University of Rome "Tor Vergata," e-mail: Roberto.paolesse@uniroma2.it.

H9 Nanostructures for Energy Conversion
(Fullerenes, Nanotubes, and Carbon Nanostructures / Energy Technology)

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: **H. Imahori**, Kyoto University, e-mail: imahori@kyoto-u.ac.jp; and **P. V. Kamat**, Dept. of Chemistry & Biochemistry, Radiation Laboratory, University of Notre Dame, e-mail: pkamat@nd.edu.

H10 Chemistry and Physics of Graphene and 2D Nanostructures
(Fullerenes, Nanotubes, and Carbon Nanostructures / Energy Technology)

The symposium focuses on the synthesis, functionalization, characterization, and physical and chemical properties of graphene and graphene based 2D nanostructures. Papers that describe optical, electrical, and electrochemical properties of these carbon nanostructures and composites, and their application in catalysis, batteries, fuel cells, optoelectronics, and solar energy conversion systems will be considered in this symposium.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **P. V. Kamat**, Dept. of Chemistry & Biochemistry, Radiation Laboratory, University of Notre Dame, e-mail: pkamat@nd.edu; and **H. Grebel**, Dept. of Electrical and Computer Eng., New Jersey Institute of Technology, e-mail: grebel@njit.edu.

H11 Chemistry, Physics, and Applications of Graphene (Graphenes, Nanotubes, and Carbon Nanostructures)
(Fullerenes, Nanotubes, and Carbon Nanostructures / Energy Technology)

Papers are invited in the following areas of graphene and related carbon nanostructures: chemistry, electrochemistry, photochemistry, physical properties, electronic, optoelectronic, thermal, bio-electronic, biochemistry, photoelectrochemistry, photovoltaic applications, in combination with catalysts, in suspension and in solid state forms, sensor studies, and applications of graphene and related carbon nanostructures.

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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. Grebel**, NJIT, e-mail: grebel@njit.edu; **A. Pénicaud**, Université Bordeaux-I, e-mail: penicaud@crpp-bordeaux.cnrs.fr; and **S. Rotkin**, Lehigh University, rotkin@lehigh.edu.

I — Physical and Analytical Electrochemistry

I1 Bioelectrocatalysis
(Physical and Analytical Electrochemistry / Energy Technology)

Papers are solicited on fundamental and applied aspects of charge transfer phenomena involving bio/electrochemical interfaces. The biological component of interest includes enzymes, multi-enzyme complexes, organelles, and whole microorganisms. It is also extended to other biological species as catalysts, substrates, transport agents, mediators, 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 substrates and products. 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. The applications towards sensors, actuator, biofuel cells or other bio-devices are of interest.

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Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **S. Minteer**, Saint Louis University, e-mail: minters@slu.edu; **P. Atanassov**, University of New Mexico, e-mail: plamen@nmu.edu; and **S. Calabrese Barton**, Michigan State University, e-mail: scb@msu.edu.

I2 Charge Transfer Processes in Biological Systems
(Physical and Analytical Electrochemistry / Organic and Biological Electrochemistry)

This symposium will provide an international and interdisciplinary forum for researchers to present their recent research on electron transfer processes present in biological systems. Electron transfer is an important process in biology, but functions of electron transfer in proteins are still in need of elucidation. Both theoretical and experimental papers are invited in the following areas for both inter and intramolecular electron transfer: electron flow, electron transfer components, mechanism of electron transfer, energy coupling, mediation of electron transfer events, electron transfer kinetics, photo-induced electron transfer, and thermally-induced electron transfer.

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Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **H. C. De Long**, Air Force Office of Scientific Research, e-mail: hugh.delong@afosr.af.mil, and **J. Burgess**, Case Western Reserve University, e-mail: jdb22@case.edu.

I3 Computational Electrochemistry
(Physical and Analytical Electrochemistry)

The goal of this symposium is to bring together scientists working in diverse areas of computational electrochemistry, in order to stimulate their awareness of common problems and group interests, facilitate exchange of ideas and opinions, and enable global, unifying views on this emerging interdisciplinary branch of electrochemistry and computational science.

The symposium will be devoted to all aspects of computer and computational method uses in electrochemistry, including (but not necessarily limited to): quantum chemical and molecular simulations in electrochemistry (ab initio, Monte-Carlo, molecular dynamics, etc.); digital simulations of electrochemical transport and kinetic/electroanalytical problems (continuum modeling, including PDE/ODE/DAE solving); multi-physics and multi-scale simulations in electrochemistry; computer-aided data analysis in electrochemical kinetics and electroanalysis; engineering simulations and other computations relevant to electrochemical engineering; software, problem-solving environments, expert systems, databases, web-based programs, grid applications, etc. for electrochemistry.

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Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizer: **S. J. Paddison**, University of Tennessee, e-mail: spaddison@utk.edu.

I4 Electrocatalysis 5
(Physical and Analytical Electrochemistry)

The symposium will provide an interdisciplinary forum to discuss new results, concepts, and methodologies in the field of electrocatalysis. True revolution put in force in recent years is due to the application of high-level theoretical tools and computational methods for increasing understanding of surface reactions involved in electrocatalysis, and new in situ techniques with atomic-level specificity. The primary objective of these approaches is to help with synthesizing new catalytic materials, as well as to enhance the significance of electrocatalysis in fuel cell science & technology. A continuous addition of new experimental tools for investigations of surface processes on fuel cell catalysts, and on model surfaces supports a rapid growth of the field. The progress in theory and experiment is intimately connected to surface science and heterogeneous catalysis where the demand for theory is likewise overwhelming.

The following topics will be highlighted: (1.) PEM electrocatalysis, ligand (electronic) and ensemble effects, bifunctional mechanism, structure and composition of reaction site on bimetallic and ternary electrocatalysts (also: islands, defects and surface clusters, etc.); (2.) theoretical description: accuracy and predictability; (3.) surface diffusion; (4.) intermediates: stable vs. transient; (5.) single crystal electrodes (adsorbates and deposits); (6.) nanotechnology and/or the application of nanoparticles; (7.) new trends in the applications of vibrational methods, methods from UHV surface science and synchrotron X-ray methods in studies of electrochemical interfaces; (8.) other non-electrochemical techniques for the study of interfacial structure and (9.) electrical double layer measurements and modeling in situ, and in UHV.

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Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **G. Brisard**, Universite de Sherbrooke, e-mail: Gessie.Brisard@USherbrooke.ca; **A. Wieckowski**, University of Illinois, e-mail: andrzej@scs.uiuc.edu; and **V. Ramani**, Department of Chemical and Environmental Engineering, Illinois Institute of Technology, e-mail: ramani@iit.edu

I5 Grahame Award Symposium and Physical and Analytical Electrochemistry General Session
(Physical and Analytical Electrochemistry)

Papers concerning any aspect of physical and analytical 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 ECS headquarters, and questions and inquiries should be sent to the symposium organizer: **S. Minteer**, Saint Louis University, e-mail: minters@slu.edu.

I6 Nanostructured and Functionalized Electroactive Polymer Films and Related Materials 2
(Physical and Analytical Electrochemistry / Sensor / Corrosion)

The symposium will provide an interdisciplinary forum for exchange of ideas and discussion of new results and crucial achievements in the electrochemical science and technology of electroactive films fabricated on nano- or micro-scale from materials such as redox polymers, electronically conducting organic polymers, and related polynuclear systems that include inorganic and hybrid (composite, organic-inorganic) materials. Among inorganic analogues, cyanometallates, polyoxometallates, sol-gel processed materials, and clays shall be mentioned. Typical session topics will cover (but they will not be limited to) the fundamental and applied aspects of fabrication of novel (organic, inorganic, hybrid) polymeric micro- and nanostructures, experimental and theoretical studies of their properties, mechanisms and dynamics of charge propagation and electroactivity, reactivity and electrocatalysis, as well as applications to chemical sensing, electrocatalysis, photoelectrochemistry (*e.g.* solar cells), corrosion protection, micro- and nanoelectrochemical (molecular) electronics, nonlinear optics, electrochromism, electroluminescence. During symposium we are hoping to outline important directions for the future.

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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. Kulesza**, University of Warsaw, e-mail: pkulesza@chem.uw.edu.pl; **D. Hansen**, University of Dayton, e-mail: douglas.hansen@udri.udayton.edu; **C. Kranz**, University of Ulm, e-mail: christine.kranz@uni-ulm.de; **M. Vorotyntsev**, Universite de Bourgogne e-mail: mv@u-bourgogne.fr; and **M. Skompska**, University of Warsaw, e-mail: mskomps@chem.uw.edu.pl.

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

J1 Sensors, Actuators, and Microsystems General Session
(Sensor)

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

This symposium intends to bring together a range of interdisciplinary topics and covers all materials aspects of sensors, actuators, and microsystems. Primary emphasis will be placed upon applied aspects of the materials, synthesis, evaluation, and development strategies of novel materials/device configurations for sensing and actuating functions as well as integrated microsystems. High temperature as well as low temperature applications will be discussed. Papers are solicited in, but not limited to, the following areas: (1.) physics and chemistry of sensor and actuator materials, fabrication and characterization of novel compositions; (2.) novel routes for the synthesis of materials with grain (pore) size control and distributions; (3.) novel sensor and actuator concepts, design, modeling, and verification; (4.) sensing systems that include sampling systems and actuators like sensor arrays, and electronic noses and tongues; (5.) physical, chemical, and biological sensors and actuators, such as gas, humidity, ion or molecular sensors, their system integration and actuating functions; (6.) optical, RF, and wireless sensors and actuators, such as fiber optic sensors, microwave sensors, optical and wireless integrations; (7.) emerging technologies and applications including sensors based on nanotechnology; and (8.) novel techniques to expand and insure sensor stability and reliability.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Z. Aguilar**, Vegrandis, LLC, e-mail: zapaguilar@yahoo.com; and **J. Li**, NASA Ames Research Center, e-mail: Jing.Li-1@nasa.gov.

J2 Sensors for Harsh Environments
(Sensor / High Temperature Materials)

This symposium will focus on electrochemical and other types of sensors used in harsh environment. The harsh environment targeted in this symposium will include but not be limited to highly corrosive solutions, high temperature, high pressure, radioactive environments, extremely acidic and/or basic conditions, etc. Sensors that have potential applications in coal-fired power plants, chemical industry, space and marine are some examples. Emphasis will be placed on selection and

characterization of sensor materials, evaluations of performance, modeling simulations, integration with instruments, sensor network, remote control to protect operators from the harsh environment, and development strategies to achieve efficient and functional devices and sensors for harsh environments.

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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. Aguilar**, Ocean Nano Tech, LLC, e-mail: zapaguilar@yahoo.com; **V. Lvovich**, West Virginia University, e-mail: vlvovich@ameritech.net; **R. Mukundan**, Los Alamos National Laboratory, e-mail: mukundan@lanl.gov; and **N. Wu**, West Virginia University, e-mail: nick.wu@mail.wvu.edu.

J3 Sensors for Biomedical Applications
(Sensor / Organic and Biological Electrochemistry)

This symposium will provide a forum for the discussion of research and development in the field of sensors for biomedical applications. The following is a partial list of the topics of interest: (1) sensors for point of care applications; (2) breath analysis sensors; (3) sensors that aid independent care; (4) sensors for blood analysis; (5) new biological monitoring sensors – heart, lung, nerve transmission sensors; and (6) sensors for cancer and disease detection. All transduction methods are of interest for this symposium.

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Travel Grant Application ECS Montréal, Canada

The Society's Battery, Corrosion, Dielectric Science & Technology, Electrodeposition, Electronics and Photonics, Energy Technology, High Temperature Materials (HTM), Industrial Electrochemistry and Electrochemical Engineering (IE&EE), 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 Montréal, Canada, May 1-6, 2011. 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 requirements might differ among Divisions.

Meeting Site:_____

Name:_____

School Adress: _____

_____

Email:_____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 only one Division. *(Applications made to multiple Divisions will be rejected.)*

- ❑ Battery—*Send to*: Venkat Subramanian, Dept. of Energy, Environment, and Chemical Engineering, Washington University, St. Louis, MO 63130, USA, e-mail: vsubramanian@seas.wustl.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
- ❑ Dielectric Science & Technology—*Send to*: H. Rathore, IBM, Retired, e-mail: rathore@yahoo.com
- ❑ Electrodeposition—*Send to*: Stanko Brankovic, University of Houston, Dept. of ECE, Bldg. 1 N308, Houston, TX 77204, USA, e-mail: stanko.brankovic@mail.uh.edu
- ❑ 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*: Matthew Mench, Penn State University, Dept. of Mech. Eng., 327 Reber Bldg., University Park, PA 16802, USA, e-mail: mmench@psu.edu
- ❑ HTM—*Send to*: Xiao-Dong Zhou, University of South Carolina, 301 Main St., Columbia, SC 29208, USA, e-mail: xiao-dong.zhou@sc.edu
- ❑ IE&EE—*Send to*: G. Venkat Subramanian, Department of Energy, Environment, and Chemical Engineering, Washington University, St. Louis, MO 63130 USA, e-mail: vsubramanian@seas.wustl.edu
- ❑ OBE—*Send to*: I. Taniguchi, Kumamoto University, Fac. of Appl. Chem & Biochem., 2-39-1 Kurokami, Kumamoto 860-8555, Japan, e-mail: taniguch@gpo.kumamoto-u.ac.jp
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