



212th ECS Meeting

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Welcome to Washington, DC—a dynamic and thriving cultural center that is home to some of the world's most famous museums, historic sites, award-winning theatres, innovative restaurants, majestic neoclassical architecture, and sweeping memorials. We are pleased to venture into this city again for the 212th ECS Meeting. This major international conference will be held at the Hilton Washington Hotel and will include 35 topical symposia comprised of 1,576 technical presentations.

Featured Speakers



SUNDAY, OCTOBER 7

For the Rest of Us...

1830h, Lincoln East/West,
Concourse Level

Understanding Non-Conventional Photovoltaic Cells

by Laurie Peter

Prof. Peter's talk will show how non-conventional cells work and will explain how they can be

described within a simple unified theoretical framework that is accessible to physicists and chemists alike, and which allows definition of strategies for device optimization.

Recent years have seen the development of several unconventional types of solar cell that, at first sight at least, appear to differ substantially from normal solid state cells. Two examples of these non-conventional PV cells are dye-sensitized nanocrystalline solar cells (DSC or Grätzel cells) and bulk heterojunction organic solar cells (polymer/fullerene cells).

The common feature of these cells is an extended three-dimensional nanostructured junction formed by interpenetration of electron and hole conducting phases. In both types of cell, the primary step in the process of converting solar energy into electrical power involves absorption of photons to create a molecular excited state that can be described as a tightly bound exciton. The subsequent separation of charge across the interfacial region between the two phases (exciton dissociation) leads to a long-lived charge separated state, with the electron in one phase and

the hole in the other. The generation of a photovoltage at the cell contacts reflects the deviation in the local electron and hole concentrations from their (generally very low) values in thermal equilibrium, and this in turn depends on the balance between the rate of electron hole pair generation by light and the rate of electron hole recombination across the nanostructured interface. By contrast, efficient generation of a photocurrent requires not only selective contacts, but also carrier transit times that are shorter than typical recombination lifetimes. Remarkably, these cells can satisfy these two criteria in spite of the enormous internal surface area at which electron-hole recombination can occur.

In the DSC, the interface is formed between an electronically conducting porous nanocrystalline oxide matrix (usually titanium dioxide) and an ionically conducting redox electrolyte or other 'hole conducting' medium. The high ionic strength electrolyte that permeates the porous oxide film effectively screens electronic charge in the oxide, largely eliminating macroscopic electrical fields and space charge effects. The driving force for the separation of electrons and 'holes' is therefore related primarily to the concentration gradients set up when carriers are extracted at the contacts.

LAURIE PETER is currently a professor of physical chemistry at the University of Bath in the United Kingdom. He received both his BSc and PhD from the University of Southampton, where his PhD research under the supervision of Sir Graham Hills was concerned with electrode kinetics in aprotic media. Prof. Peter was introduced to photophysics and semiconductor electrochemistry during the five years (1969-1974) that he spent working in the late Professor Heinz Gerischer's laboratory at the Fritz Haber Institute in Berlin, first as a CIBA Postdoctoral Fellow and then as a staff member.

In 1974, Prof. Peter became lecturer at the University of Southampton and was promoted to a Chair 1993. During this period, he worked on a range of topics including electrocrystallization, anodic films on metals, conducting polymers, semiconductor electrochemistry and porous silicon. Prof. Peter developed the technique of intensity modulated photocurrent spectroscopy (IMPS), the first of several related experimental techniques for characterizing the kinetics of photoelectrochemical reactions.

Prof. Peter's more recent work has developed a strong practical focus on the application of electrochemistry and photoelectrochemistry for the fabrication and characterization of thin film solar cells. He has developed a number of experimental methods to characterize the dynamic behavior of photoelectrochemical systems, including DSC.

Prof. Peter has published around 230 scientific papers as well as several book chapters. He was awarded the Electrochemistry Medal of the Royal Society of Chemistry in 1992 and the Pergamon Medal of the International Society of Electrochemistry in 1997. He has been a Leverhulme Research Fellow and a Vice-President of the International Society of Electrochemistry. Until recently, he was a long-serving Editor of the Journal of Electroanalytical Chemistry.



MONDAY, OCTOBER 8
Plenary Session
**0800h, International Ballroom Center,
Concourse Level**

The ECS Lecture
**The Origins of and
Imperative for Green IT**
by Bernard S. Meyerson

In this talk, Dr. Meyerson will cover the latest trend in technology: how the industry went over a power cliff many did not see coming, driving the need for dramatic strategy shifts and technology innovations going forward; and how collaborative innovation is becoming the gold standard for joint efforts.

When the silicon technology train came off the rails after forty years of linear progress, the impact of that departure was staggering. It was marked by the end of the close coupling between the regular scaling of chip density, well known as Moore's law, and the associated improvements in technology performance. As materials crucial to chip performance (e.g., aluminum and silicon dioxide) reached the end of their useful lives, one no longer obtained performance benefits from ever more aggressive device dimensions. Those caught unaware encountered unacceptable spikes in chip and associated system power requirements. Combining this "progress" in chip technology with high density packaging had led to a crisis in data centers worldwide, where the energy costs of operating such data centers approached those of provisioning them. The increasing carbon footprint associated with information technology (IT), though still modest, forewarns of action required to prevent out-of-control growth. This talk will address the origins of the challenges we now face, and actions underway in technology and systems to proactively address this now critical issue impacting the future of all IT.

BERNARD S. MEYERSON is Vice-President for Strategic Alliances and Chief Technology Officer (CTO) of IBM's Systems and Technology Group (STG). In 1980, Dr. Meyerson joined IBM Research as a staff member, leading the development of silicon germanium and other high performance technologies over a period of 10 years. In 1992, Dr. Meyerson was appointed an IBM Fellow, IBM's highest technical honor.

In 2003 he assumed operational responsibility as the head of IBM's Semiconductor Research and Development Center (SRDC), and led the world's largest semiconductor development consortium, with members being IBM, Sony, Toshiba, AMD, Samsung, Chartered Semiconductor, and Infineon.

Dr. Meyerson has received numerous awards for his work, which include the Materials Research Society Medal, the ECS Electronics and Photonics Division Award, the IEEE Ernst Weber Award for the body of work culminating in the commercialization of Si-Ge-based communications technology, and the IEEE Electron Devices Society J. J. Ebers Award.

Dr. Meyerson was cited as "Inventor of the Year" by the New York State Legislature in 1988, and he was

recognized as "United States Distinguished Inventor of the Year" by the U.S. IP Law Association and the Patent and Trademark office in 1999. He was also elected to the National Academy of Engineering in 2002.



**Olin Palladium Medal
Award Lecture**
**An Excursion to the Heart of
Electrochemistry**
by Sergio Trasatti

"An Excursion into the Heart of Electrochemistry" is intended to touch upon fundamental concepts that have been developed in Dr. Trasatti's scientific production, starting from the point of considering

the electronic energy of metals as the primary factor establishing a number of observed regularities in the properties of electrode interfaces. The survey will include the physical meaning of electrode potentials, pzc-work function relationships, metal/vacuum vs. metal/solution interfaces, metal vs. oxide surface properties, and factors of electrocatalysis.

SERGIO TRASATTI received his "Laureato" in industrial chemistry at the University of Milan in 1961, became assistant professor in the same university in 1967, and won the Chair of Industrial Electrochemistry in 1980. In 1989 he was called to the Chair of Electrochemistry.

Dr. Trasatti's research interests are in the field of the electrical double layer, electrocatalysis, electrochemical surface science, single electrode potential, surface chemistry of oxides, and metal and oxide single crystals. Dr. Trasatti is the author of about 300 papers including 13 chapters in multi-authored books. Editor of a book in two volumes on "Electrodes of Conductive Metallic Oxides" and of several special issues, he is a member of the editorial boards of major electrochemistry journals and book series.

Titular member of the IUPAC Commission on Electrochemistry since 1976, Dr. Trasatti was chair of the Commission (1985-86), and elected member of the IUPAC Physical Chemistry Division Committee for the term 1987-90. He was President of ISE for the term 1989-1990, Chair of the Publication Committee in 1999-2001, and one of the Editors of *Electrochimica Acta*, the official journal of ISE (2002) of which he has been Editor-in-Chief since January 2003.

Dr. Trasatti's awards and recognitions include the "Miolati" Prize of the Italian Association of Physical Chemistry (1975); Honorary Member of the Polish Chemical Society (1985); Distinguished Lecturer at the Clarkson University, Potsdam NY (1988); Pergamon-Electrochimica Acta Gold Medal of ISE (1993); Corresponding Member of the National Academy of Sciences of Argentina (1994); Corresponding Member of the Istituto Lombardo Accademia di Scienze e Lettere (1997); 75th Anniversary Medal of the Polish Chemical Society (1997); Honorary Medal of the Institute of Physical Chemistry of the Polish Academy of Sciences (2000); ECS Fellow (2000); Frumkin Memorial Medal of ISE (2003); Honorary Member of ISE (2004); and recipient of the Gold Seal of the Italian Chemical Society (2007).

2007 Olin Palladium Award Reception—All meeting registrants are invited to attend the award reception honoring Sergio Trasatti, recipient of the 2007 Olin Palladium Medal, on Tuesday, October 9, at 1800-1845h, in Cabinet on the Concourse Level.

Short Courses, Tutorials, and Workshops

Six Short Courses will be held on Sunday, October 7, 2007, from 0900h to 1700h. The registration fee is \$425 for ECS Members and \$520 for nonmembers. Students are offered a 50% discount. The registration fee for the course covers the course, text materials, continental breakfast, luncheon, and refreshment breaks; it is not applicable to any other activities of the meeting. The **Corporate Tutorial** will be held Sunday, October 7, from 1300 to 1600h. The fee is \$250 for ECS members and \$298 for nonmembers. Students may take a 50% discount. Employees of ECS Corporate Member organizations are entitled to complimentary registration to this tutorial: complete the form in the registration brochure (available online) and return via fax or e-mail (do not register online). Written requests for refunds will be honored only if received at Society headquarters before September 12, 2007. Pre-registration is required. All courses are subject to cancellation pending an appropriate number of advance registrants. ECS will hold three **Professional Development Workshops**, which are free to meeting registrants.

Visit the ECS website for full course descriptions and instructor biographies.

SHORT COURSE #1: Electrodeposition of Magnetic Materials *S. Brankovic and G. Zangari, Instructors*

This course will provide attendees with a theoretical and working knowledge of the electrodeposition of magnetic materials, including soft and hard materials, and the characterization of materials and processes in the context of various technological applications.

SHORT COURSE #2 PEM Fuel Cells *E. Stuve and H. Gasteiger, Instructors*

This short-course develops the fundamental thermodynamics and electrocatalytic processes critical to polymer electrolyte membrane fuel cells (PEMFC), including relevant half-cell reactions, their thermodynamic driving forces, and their mathematical foundations in electrocatalysis theory. Also covered will be the different functional requirements of actual PEMFC components, basic *in situ* diagnostics, principles of fuel cell catalyst activity measurements, the impact of uncontrolled-operation events, and the various effects of long-term materials degradation.

SHORT COURSE #3 Basics of Impedance Spectroscopy *Mark E. Orazem, Instructor*

This course is intended for chemists, physicists, materials scientists, and engineers with an interest in applying electrochemical impedance techniques to study a broad variety of electrochemical processes. Ideally, the attendee should have some experience with making impedance measurements. The attendee will develop a basic understanding of the technique, the sources of errors in impedance measurements, the manner in which experiments can be optimized to reduce these errors, and the use of regression to interpret measurements in terms of meaningful physical properties.

SHORT COURSE #4 Lithium Ion Battery Materials *M. Winter and Y. S. Meng, Instructors*

This course will cover the following: a general introduction to lithium and lithium ion batteries; anodes and interface considerations; electrolytes; cathodes, interface considerations, computational approach; cathode vs. anode interactions, inactive components; and conclusions and feedback.

SHORT COURSE #5 Basic Electrochemical Measurements *Bill Eggers, Instructor*

The course is targeted at scientists and engineers who are tasked with using electrochemical techniques in a variety of application areas: fuel cells, capacitors and batteries, corrosion, physical electrochemistry, electrodeposition, and sensors. The course will take a look at the basics of electrochemistry, the instruments and cells used in performing the experiments, the techniques available, and the interpretation of results.

SHORT COURSE #6 Basics of Cleaning Processing of Integrated Circuit Manufacturing *K. A. Reinhardt, J. W. Butterbaugh, and R. J. Small, Instructors*

This course provides a working knowledge of surface conditioning and cleaning techniques used in the manufacture of integrated circuits. Fundamentals of the techniques used for cleaning the wafer surface will be discussed. Practical applications and methods for cleaning will be presented. Upon completing this course participants will have a understanding of all types of cleaning processes used in IC manufacturing; surface conditioning for pre-diffusion clean, in particular pre-gate oxide clean, post-etch and post-implant photoresist removal, particle removal, and post-CMP clean.

TUTORIAL Intellectual Property: An Introduction for Research Scientists, Engineers and Technologists *E. Jennings Taylor, Instructor*

This tutorial will provide an introduction to the various forms of intellectual property, trade secrets, trademarks, and copyrights with an emphasis on patents. The objective of the tutorial is to provide the electrochemist/engineer an appreciation of the patenting process and not to replace legal counsel. Advance registration required.

PROFESSIONAL DEVELOPMENT WORKSHOPS *John R. Susko, Instructor*

ECS will sponsor the following three professional development workshops at no extra cost to meeting registrants. All workshops will be held in Kalorama, Terrace Level.

Writing an Effective Cover Letter and Resume—The need for a cover letter, how to write it, the many “do’s” and “don’ts” in preparing such a letter, and tips for drafting an effective resume. Sunday, 1500-1545h and Monday, 1200-1245h

Job Interviewing Tips—How to improve your chances of impressing the interviewer; key questions to ask; and other important pointers for the interviewing process. Sunday, 1600-1645h and Monday, 1300-1345h

Resume Round Table—Designed to provide feedback on resumes by publicly critiquing participants’ resumes and offering suggestions on ways to make them more effective. To take full advantage of the workshop, please bring a copy of your current professional resume. Monday, 1400-1700h

Award Winners

NOTE: For complete biographies of the award recipients, and the schedule of their presentations, please see the General Meeting Program on the ECS website: www.electrochem.org/meetings/biannual/212/212.htm.



Carl Wagner Memorial Award

PHILIP N. BARLETT received a BA in chemistry from the University of Oxford in 1978. He was awarded a British Petroleum Scholarship to study for a PhD in photoelectrochemistry under the supervision of Professor W. John Albery FRS at Imperial College in London and received his PhD in 1981. Following his PhD, Professor Bartlett was awarded a Research Fellowship from the Royal Society for the Exhibition of 1851 to work on modified electrodes at Imperial College. In 1984 he was appointed to a lectureship in physical chemistry at the University of Warwick and in 1991 as Professor of physical chemistry at the University of Bath. Since 1993 he has been at the University of Southampton where he is Professor of electrochemistry and currently the Deputy Head of School responsible for research. Prof. Bartlett's research interests are in the areas of bioelectrochemistry, electrochemical sensors and electrodeposition and applications of nanomaterials. Current research in his group includes work on the design of electrode surfaces for enzyme and coenzyme electrochemistry for applications in biosensors and bioelectrosynthesis and the application of high throughput methods to the design of modified electrodes for NADH oxidation.



Honorary Membership

JOHN NEWMAN earned his BS in chemical engineering in 1960 from Northwestern University. While at Northwestern University, he was an engineering co-op student at Oak Ridge National Laboratory, where he worked on diffusion in ion exchangers and solvent extraction. Newman entered the University of California, Berkeley for graduate study, obtaining his master's degree in 1962, on current distribution in porous electrodes, under the guidance of Professor Charles Tobias. In 1963 he obtained his doctorate, on steady laminar flow past a circular cylinder at high Reynolds numbers. While a PhD student, he contributed to the preparation of major portions of the English edition of Levich's book, *Physicochemical Hydrodynamics*, published in 1962. Shortly after receiving his doctorate, Newman joined the faculty at UC Berkeley and became a full professor in 1970, where he is still an active member. He is also a Faculty Senior Scientist and Principal Investigator in the Environmental Energy Technologies Division at Lawrence Berkeley National Laboratory, where he is in charge of the Batteries for Advanced Transportation Technologies program. Lithium/polymer batteries and polymer-electrolyte fuel cells have been highlights of recent work. In 1999, he was elected to the National Academy of Engineering.



Honorary Membership

JERRY M. WOODALL, a National Medal of Technology Laureate (2001), and distinguished professor of electrical and computer engineering at Purdue University, received a BS in metallurgy in 1960 from MIT. In 1982, he was awarded a PhD in electrical engineering from Cornell University. He pioneered and patented the development of GaAs high efficiency IR LEDs, used today in remote control and data link applications such as TV sets and IR LAN. This was followed by the invention and seminal work on gallium aluminum arsenide (GaAlAs) and GaAlAs/GaAs heterojunctions used in super-bright red LEDs and lasers used, for example, in CD players and short link optical fiber communications. He also pioneered and patented the GaAlAs/GaAs heterojunction bipolar transistor used in, for example, cellular phones. Also, using GaAs/InGaAs strained, non-lattice-matched heterostructures, he pioneered the "pseudomorphic" high electron mobility transistor (HEMT), a state-of-the-art high speed device widely used in cellular phones. Honorary recognition includes his election to the National Academy of Engineering in 1989, Fellow of the American Physical Society in 1982, IEEE Fellow in 1990, ECS Fellow in 1992, and AVS Fellow in 1994. His national professional society activities include President of ECS (1990).



2007 Class of Fellows

SIMON S. ANG received his BSEE degree from the University of Arkansas in 1980, MSEE degree from Georgia Institute of Technology in 1981, and PhD degree in electrical engineering from Southern Methodist University in 1985. He joined Texas Instruments, Inc., Dallas, in 1981, starting as a product engineer and later as an engineering manager in power integrated circuit development. Since 1988, he has been with the University of Arkansas where he is currently a professor of electrical engineering, and an adjunct professor in microelectronics/ photonics and biomedical engineering. Dr. Ang has wide research interests that cover microelectronic packaging, brain sensors, chemical sensors, microelectromechanical systems, microelectronic materials, solar cells, switching converters, mixed-signal circuit and test.



VIOLA BIRSS obtained her PhD as a Commonwealth Scholar at the University of Auckland in the area of anodic film formation at silver electrodes with Dr. G. A. Wright. She then took on a position with Dr. B. E. Conway at the University of Ottawa to carry out pioneering work on the supercapacitive properties of hydrous metal oxides, particularly Ru oxide, which has spawned much of the current great interest in this area. She was then employed as a research scientist with Alcan International Ltd. in Kingston, Ontario, where she worked on pitting and stress corrosion and on the development of new Al alloys. After one year at Alcan, Dr. Birss joined the Chemistry Department at the University of Calgary as an assistant professor in 1983, where she was promoted to associate professor in 1987 and to full professor in 1991. Since joining the University of Calgary, Dr. Birss's principal area of research has been on the growth mechanism, nanostructure, and electrochemical properties of a wide range of surface films. More recent work has had a strong

2007 Class of Fellows (continued)

focus on solid oxide fuel cells, where Dr. Birss' key research achievements include the establishment of the kinetics and mechanisms of fuel oxidation and oxygen reduction reactions using 3-electrode electrochemical methods, and on overcoming sulfur poisoning and Cr contamination. Dr. Birss is a founder and co-chair of the Western Canada Fuel Cell Initiative (WCFCI), involving over 35 research groups at 8 institutions. She is also the co-founder of Solid Oxide Fuel Cells Canada, currently involving over 90 individuals from industry, government, and academia.



MARC CAHAY received his BS in physics from the University of Liege, Belgium, in 1981. He has a Master's degree in physics and a PhD in electrical engineering, which he received from Purdue University in 1986 and 1987, respectively. He joined the Department of Electrical and Computer Engineering at the University of Cincinnati in 1989. He has over twenty years experience in the field of semiconductor devices and materials. His most recent research

interests include nanotechnology, vacuum microelectronics, and spintronics. He is co-author of a book, *Introduction to Spintronics*, for CRC Book Press to appear in 2007. Dr. Cahay's research highlights include the first self-consistent calculation of the current-voltage characteristics of resonant tunneling diodes taking into account space-charge effects. He has also proposed the use of rare-earth sulfide materials to build chemically and thermally stable cold cathodes with experimentally demonstrated work function as low as 1 eV. More recently, he has shown that the spin relaxation times of organic spin valves grown into the nanopores of self-assembled alumina templates can be three orders of magnitude larger than the longest values recorded in compound semiconductors.



JAMES M. FENTON has been Director of the Florida Solar Energy Center since January, 2005. The center, a research institute of the University of Central Florida, is the country's largest and most active state alternative energy research center. He also serves as a professor in UCF's Mechanical, Materials and Aerospace Engineering Department. Prior to joining FSEC, he spent 20 years as a chemical engineering professor at the University

of Connecticut. Dr. Fenton's research activities in fuel cells, pollution prevention, and sustainable energy are helping FSEC expand their nationally acclaimed research and education programs in hydrogen, alternative fuels, solar energy, and buildings energy efficiency. He received his PhD in chemical engineering from the University of Illinois in 1984 and his BS from UCLA in 1979. Fenton's research group has developed high-temperature (> 95°C), low-relative humidity membrane-electrode assemblies (MEAs) for proton-exchange membrane fuel cell (PEMFC) applications, and analytical and diagnostic techniques, based on fundamental understanding, to quantify the six sources of polarization losses in the MEA to help in the optimization of fuel cell components for a given application. He is the Principal Investigator of the "Lead Research and Development Activity for DOE's High Temperature, Low Relative Humidity Membrane Program." FSEC leads the 12-member university and industry team receiving \$19 million in federal funding over five years for high temperature low relative humidity polymer membrane research.



DENNIS G. PETERS began his academic career as an instructor at Indiana University in 1962, and he has been the Herman T. Briscoe Professor of Chemistry at that institution since 1975. He received his BS (*cum laude*) from the California Institute of Technology in 1958 and his PhD from Harvard University in 1962. During the last 35 years, his research has focused on mechanistic and synthetic aspects of the electrochemical reduction

of halogenated organic compounds in nonaqueous media. His research has involved detailed explorations of the direct cathodic reduction of alkyl halides, olefinic and acetylenic halides, and acyl halides at mercury and carbon cathodes. In addition, he has investigated the use of electrogenerated nickel(I) and cobalt(I) complexes as catalysts for the indirect reductive cleavage of halogenated organic substrates. In the area of synthetic organic electrochemistry, he has studied both direct and indirect intramolecular reductive cyclization reactions; and, quite recently, ring-expansion reactions induced catalytically by electrogenerated nickel(I) and cobalt(I) salen. Recently, he has received the Distinguished Service Award from Indiana University (2005) and the George W. Pinnell Award for Outstanding Service to Indiana University (2006).



DANIEL SCHERSON received his License in chemistry from the Faculty of Basic Sciences, University of Chile, Santiago, Chile in 1974, and his PhD in chemistry from University of California, Davis in 1979. Following a string of post-doctoral research appointments at UC Berkeley with Prof. Newman, at the Lawrence Berkeley National Laboratory with Dr. Phil Ross, at Case Western Reserve University with Prof. Yeager, and lastly with Prof. Dieter Kolb at the Fritz Haber Institute in Berlin, he

joined Case Western Reserve University as an assistant professor in the Department of Chemistry in 1983. Prof. Scherson is currently the Charles F. Mabery Professorship of Research in Chemistry, a position he has held since 2003, and also Director of the Ernest B. Yeager Center for Electrochemical Sciences. He has published over 200 hundred papers and 5 U.S. and international patents. Prof. Scherson has served as an Associate Editor of the *Journal of The Electrochemical Society* and has been appointed by the Society to become Editor of this Journal in 2008. During his career he has received a number of awards including a Vittorio de Nora - Diamond Shamrock Postdoctoral Fellowship (1981), a Max Planck Gesellschaft Fellowship (1982-83), an IBM Faculty Development Award (1983-85), a Japan Society for the Promotion of Science Fellowship (1993-94), the David C. Grahame Award of the Physical Electrochemistry Division of ECS (2000), an Alexander von Humboldt Senior Fellowship Award (2002), and the Faraday Medal of the Electrochemistry Group of the Royal Chemical Society (2004). His major research interests are in the areas of experimental and theoretical aspects of electrocatalysis and the development of time- and spatially resolved *in situ* techniques for the study of solid-liquid interfaces.



ERIC D. WACHSMAN is the Director of the Florida Institute for Sustainable Energy, Director of the U.S. Department of Energy High Temperature Electrochemistry Center at the University of Florida, and a UF Research Foundation Professor in the Department of Materials Science & Engineering. He received his PhD in materials science and engineering from Stanford University, and his BS in chemical engineering from the

University of California at Berkeley. Dr. Wachsman has focused his career on developing advanced, efficient, energy conversion devices and technologies. His research is on electronically and chemically functional ceramics, ionic transport in solids, and the heterogeneous electrocatalysis at their surface. This research includes the development of solid oxide fuel cells (SOFC), gas separation membranes, solid-state gas sensors, the electrocatalytic conversion of CH_4 , and the post-combustion reduction of NO_x , using advanced oxygen-ion conducting materials. He is an Editor of *Ionics* and formerly an Associate Editor of the *Journal of the American Ceramic Society*. Dr. Wachsman is a frequent invited panelist on fuel cell and hydrogen energy research, ranging from the U.S. Department of Energy "Fuel Cell Report to Congress" and "Basic Research Needs Related to High Temperature Electrochemical Devices for Hydrogen Production, Storage and Use," to the National Science Foundation "Workshop on Fundamental Research Needs in Ceramics," NATO "Mixed Ionic-Electronic Conducting (MIEC) Perovskites for Advanced Energy Systems," and the National Academies "Global Dialogues on Emerging Science and Technologies."



Battery Division Technology Award

MICHEL BROUSSELY graduated Dr. des Sciences Physiques (Poitiers University, France) in 1975. While a student at the university, he had his first experience with lithium batteries during a one year training period (1971) at the research laboratory of Saft/Department Piles. It was under the direction of Jean Paul Gabano, the well known pioneer

in lithium batteries, and recipient of the Battery Division Research Award in 1987. Dr. Broussely joined Saft in Poitiers, France in August 1975 as a research engineer in the research team on lithium batteries. His first research work and first patent was devoted to non-aqueous electrolytes for primary solid cathode lithium batteries, a challenge at that time. He also participated at that time in the development of the first lithium battery commercialized by Saft, $\text{Li}/\text{Ag}_2\text{CrO}_4$ for pacemakers, then in the development of lithium/thionyl chloride, still widely manufactured today. For 32 years, he has been actively participating in different positions at Saft in the R&D of many type of lithium primary batteries, then rechargeable and Li ion. He is now Scientific Director of Saft, in the Specialty Battery Group. He has been a member of the scientific committee of the International Meeting on Lithium Batteries (IMLB) since 1992 when he was chair of the technical program of the 6th meeting in Münster, Germany. He is author or co-author of many patents and scientific publications in the field. Contributor to several books on batteries, he recently co-edited a book on the industrial applications of batteries.



Battery Division Research Award

CLARE P. GREY is a professor at Stony Brook University (SBU), a member of the State University of New York system. She received a BA (1987) and a D. Phil. (1991) from the University of Oxford. Afterward, she spent a year at the University of Nijmegen, as a Royal Society postdoctoral fellow (1991), and two years as a visiting scientist at DuPont CR&D in Wilmington, DE

(1992-1993). She joined the faculty at SBU in 1994. She is the recipient of an NSF National Young Investigator Award (1994), a Cottrell Scholarship (1997), a Dupont Young Professor Award (1997), and Camille and Henry Dreyfus Teacher-Scholar Award (1998), an Alfred P. Sloan

Foundation Research Fellowship (1998), and an NSF POWRE award (2000). She was a visiting Professor at the Université Louis Pasteur, Strasbourg (2000), and is currently a visiting Professor at Université de Picardie, Jules Vernes. Her research interests include the use of solid state NMR and diffraction methods to investigate structure and dynamics in materials for energy storage and conversion and environmental chemistry. In the lithium-ion battery area, she uses lithium NMR to determine local structure and mechanisms for intercalation and deintercalation of Li^+ in a wide range of electrode materials including layered materials, spinels, and oxysulfides. She developed a systematic understanding of the causes of the large NMR shifts that are often seen in these systems, and showed how this information could be used to obtain local structure and oxidation state changes. She continues to work on the development and application of novel NMR methodology to investigate complex and disordered materials.



Corrosion Division H. H. Uhlig Award

EDWARD MCCAFFERTY, formerly of the Naval Research Laboratory, is a Consultant to Science Applications International Corporation and a part-time faculty member at George Washington University. Dr. McCafferty's interests include corrosion and corrosion protection, localized corrosion, corrosion inhibition, models

of passivity and its breakdown, oxide surfaces, surface modification techniques such as ion implantation and laser-surface processing, and the adhesion of organic polymers. Dr. McCafferty is an ECS Fellow and past Chair of the Corrosion Division. He has received the Jerome Kruger Award in Corrosion Science, Baltimore-Washington Chapter of NACE (2003); and the Robert T. Foley Award (2003) and the William Blum Award (1982) of the ECS National Capital Section. He also received the NRL Sigma Xi Award in Pure Science (1992), and the Victor K. LaMer Award of the American Chemical Society (1971). Dr. McCafferty holds a BS in chemistry from Wilkes College, an MS and PhD in chemistry from Lehigh University, and an MS in Applied Mathematics from Johns Hopkins University. He has been a Visiting Scientist, Department of Chemistry and the Center for Adhesive and Sealant Science, Virginia Tech University (1996-1997); and a Robert A. Welch Postdoctoral Fellow at the University of Texas with Prof. Norman Hackerman (1968-1970). He was an Invited Lecturer, NATO Advanced Study Institute on Laser Surface Treatment of Metals, San Miniato, Italy (1985); and an invited participant at the U.S.-Japan Seminar on Corrosion, Nikko, Japan (1985).



Electrodeposition Division Research Award

IBRO TABAKOVIC is Leader of the R&D Electrodeposition Group at Seagate Technology in Bloomington, Minnesota, whose staff he joined in late 1997. Born in Banjaluka, Bosnia, Ibro Tabakovic begun studying chemical engineering at Zagreb University, Croatia, and obtained his BSc, MSc, and finally PhD in 1973. After spending

one year as a post-doc in the electrochemistry research group of Prof. Martin Fleischmann at the University of Southampton (England) he returned to Banjaluka and become docent, associate professor, and professor of chemistry at the University of Banjaluka. Dr. Tabakovic also served in an administrative capacity as the President of the University of Banjaluka (1980-1984). Because of the war in Bosnia, he was forced to move to the U.S. in 1993

and was employed as a visiting professor of chemistry at the University of Minnesota before he joined Seagate. The research of Dr. Tabakovic has been centered so far on the following fields: electrodeposition; electrochemistry of oligomers, dendrimers, and polymers; mechanistic organic electrochemistry; and synthetic organic electrochemistry. Some of his major contributions to industry are in the development of materials and processes for application in recording heads and media. Two of the most important are electrodeposited 1.8T CoNiFe and 2.4T CoFe alloys that are used in recording heads as writer soft magnetic materials. His most recent work has focused on the development of magnetic materials with high perpendicular anisotropy for future Bit Patterned Media. He developed a process for electrodeposition of CoPt alloys with high perpendicular anisotropy obtained at room temperature as a result of strong epitaxial [0002] crystallographic growth direction.



**High Temperature Materials
Division J. Bruce Wagner,
Jr. Award**

XIAO-DONG ZHOU joined the Energy Science and Technology Directorate (ESTD) at Pacific Northwest National Laboratory (PNNL) in August 2005 after a two-year experience as an assistant research professor at University of Missouri-Rolla (UMR). Prior to that, he was a postdoctoral fellow (2001-

2004) at UMR. At UMR, as an associate faculty member, he led research programs and supervised graduate students. At PNNL, Dr. Zhou is leading research on thermoelectric oxides and materials for solid oxide fuel cells; he has been principal investigator or co-principal investigator of 9 programs on materials development related to energy science and technology, and thermoelectrics. Since 2001, his early career has been highlighted by 38 peer-reviewed articles that span the areas of structural, transport and magnetic properties of condensed matters; nonstoichiometric chemistry; advanced processing and device physics. In addition, he has published 5 invited book chapters, 3 invited journal articles, and 16 proceedings papers; contributed to over 75 presentations; and received 2 U.S. patents. Materials for various energy conversion systems including fuel cells and thermoelectrics, and energy storage systems; high temperature materials for extreme environments; catalytic depolymerization of cellulose; nanowires for lithium-ion battery components; opto-electronic materials; electronic ceramics; and cytotoxicity of nano-materials.

Technical Exhibit

The Technical Session coffee break is scheduled for 0930h in the Southwest Exhibit Hall on Tuesday and Wednesday to allow meeting attendees additional time to browse through the exhibits. The exhibit will feature instruments, materials, systems, publications, and software of interest to attendees.

Exhibit Hours

Monday, October 8..... 1800-2000h
includes the Monday Evening Poster Session

Tuesday, October 9..... 0900-1400h
and re-opening 1900-2100h
includes the Tuesday evening Poster Session

Wednesday, October 10 0900-1400h

Exhibitors as of Press-Time

ECS

Booths 13 & 14
ecs@electrochem.org
www.electrochem.org

Agilent Technologies

Booth 15
Joan Horwitz
AFM-info@agilent.com
www.agilent.com/find/afm

Arbin Instruments

Booth 1
Will Lovell
info@arbin.com
www.arbin.com

Bio-Logic SAS

Booths 6 & 7
ecs2007@bio-logic.info
www.bio-logic.info

Brinkmann Instruments

Booths 22 & 23
Michele Kraemer
info@brinkmann.com
www.brinkmann.com

Electrochem, Inc.

Booth 30
Stephen Olney
sales@fuelcell.com
www.fuelcell.com

EMD Chemicals, Inc.

Booth 2
Kathy Lodge
kathy.lodge@emdchemicals.com
www.emdchemicals.com

ESI Group

Booth 27
Jessica Mattia
jmt@esi-group-na.com
www.esi-group.com

Gamry Instruments

Booths 11 & 12
Pete Peterson
ppeterson@gamry.com
www.gamry.com

Hosokawa Micron Powder Systems

Booth 5
C. C. Huang
chuang@hmps.hosokawa.com
www.hmicronpowder.com

Kurt J. Lesker Company

Booth 9
Bill Zinn
billz@lesker.com
www.lesker.com

Materials Today

Literature Display
Rachel Wilkinson
r.wilkinson@elsevier.com
www.materialstoday.com

Matheson Tri-Gas, Inc.

Booth 16
Gianni Leonarduzzi
gleonarduzzi@matheson-trigas.com
www.matheson-trigas.com

Maxtek, a Division of Inficon

Booths 17 & 18
Tom Wilson
tom.wilson@inficon.com
www.inficon.com

PEC North America

Booth 28
Peter Ulrix
peter.ulrix@peccorp.com
www.peccorp.com/batteries

Pine Research Instrumentation

Booth 8
Jenny Garry
jgarry@pineinst.com
www.pineinst.com/echem

Princeton Applied Research / Solartron Analytical

Booths 20 & 21
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Literature Display
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jessicat@infowebcom.com
www.infowebcom.com

Symposium Topics and Organizers

Sessions are marked to indicate if they run on Sunday (**S**), Monday (**M**), Tuesday (**Tu**), Wednesday (**W**), Thursday (**Th**), and/or Friday (**F**).

HC—**Hard-cover** editions of *ECS Transactions* will be available for purchase and pick-up at the meeting; or you may pre-order your hard-cover *ECS Transactions* issue using the order form in this section or when registering online.

e—**Online** editions of *ECS Transactions* issues will be available ONLY via the ECS Digital Library. Online editions of the Washington, DC “at” meeting issues will be available for purchase beginning September 28. Please visit the ECS website for all issue pricing and ordering information for the online editions.

A—General

- A1 — General Student Poster Session (M) — *G. Botte, V. Desai, and V. Subramanian*
A3 — Nanotechnology General Session (M-Tu) — *E. Traversa, J. Li, and W. Van Schalkwijk*

B—Batteries, Fuel Cells, and Energy Conversion

- B1 — Battery/Energy Technology Joint General Session (M-F) — *R. Bugga, W. Cai, J. Fenton, D. Gervasio, S. Narayanan, D. Scherson, J. Szydlo-Moore, C. Walk, and C. Wei*
B2 — Battery Safety and Abuse Tolerance (Tu-W) — *D. Doughty, K. Abraham, B. Barnett, and J. Yamaki*
B4 — Interfacial Electrochemistry and Chemistry in High Temperature Media (W-Th) — *S. Lvov, R. Dooley, D. Macdonald, S. Narayanan, and D. Wesolowski*
B6 — Modeling of Electrochemical Power Sources (W) — *R. Spotnitz, V. Srinivasan, J. Stockel, and A. Weber*
B7 — Nanomaterials for Energy Conversion and Storage (M-Th) — *G. Amatucci, C. Bock, A. Manthiram, R. Mantz, V. Ramani, and W. Van Schalkwijk*
B8 — Next Generation Photovoltaics and Photoelectrochemistry (Tu, Th) — *K. Rajeshwar, B. Marsan, R. McConnell, M. Tao, J. Turner, and T. Zawodzinski*
B10 — Proton Exchange Membrane Fuel Cells (PEMFC 7) (S-F) — *T. Fuller, C. Bock, S. Cleghorn, H. Gasteiger, A. Haug, C. Lamy, T. Nguyen, K. Ota, P. Pintauro, V. Ramani, and T. Zhao*
B1 — Rechargeable Lithium and Lithium Ion Batteries (M-F) — *M. Smart, K. Abraham, and R. Bugga*
B12 — Solid-State Ionic Devices 5 (Tu-Th) — *E. Wachsman, F. Garzon, A. Manivannan, R. Mukundan, and E. Traversa*

C—Biomedical Applications and Organic Electrochemistry

- C1 — Surface Treatments for Biomedical Applications (Tu) — *S. Djokic and D. Hansen*

D—Corrosion, Passivation, and Anodic Films

- D1 — Corrosion General Session (Tu, Th) — *A. Davenport*
D2 — High Resolution Characterization of Corrosion Processes (M-W) — *H. McMurray, A. Davenport, G. Frankel, D. Hansen, and H. Masuda*
D3 — Light Alloys 3 (Tu-Th) — *A. Davenport, R. Buchheit, N. Missert, B. Shaw, and S. Virtanen*
D4 — Modeling and Simulation of Dissolution and Corrosion Processes (M-Tu) — *R. G. Kelly, J. Meyers, F. Presuel-Moreno, and B. Tribollet*

E—Dielectric and Semiconductor Materials, Devices, and Processing

- E1 — Atomic Layer Deposition Applications 3 (M-Tu) — *A. Londergan, S. Bent, S. De Gendt, J. Elam, S. Kang, and O. Van der Straten*
E2 — Cleaning and Surface Conditioning Technology in Semiconductor Device Manufacturing 10 (M-Th) — *J. Ruzyllo, P. Besson, T. Hattori, P. Mertens, and R. E. Novak*
E3 — Analytical and Diagnostic Techniques for Semiconductor Materials, Devices, and Processes (Tu-Th) — *D. Schroder, A. Diebold, L. Fabry, R. Hockett, and H. Shimizu*
E4 — High Dielectric Constant Materials and Gate Stack 5 (M-W) — *S. Kar, S. De Gendt, M. Houssa, H. Iwai, D. Landheer, and D. Misra*
E5 — Nanocrystal Embedded Dielectrics for Electronic and Photonic Devices (Tu, Th) — *P. Mascher and P. Joshi*
E6 — Nanoscale One-Dimensional Electronic and Photonic Devices (M-Tu) — *L. Chou, Y. Bando, F. Ren, S. Roth, and Z. Wang*
E7 — Organic Semiconductor Materials and Devices (M-W) — *J. Deen, H. Klauk, and J. Ruzyllo*
E8 — State-of-the-Art Program on Compound Semiconductors (SOTAPOCS 47) (M-Tu) — *J. Wang, J. Kim, H. Kuo, and H. Ma*
E9 — ULSI Process Integration 5 (M-Th) — *C. Claeys, H. Iwai, J. Murota, and M. Tao*
E10 — Wide-Bandgap Semiconductor Materials & Devices 8 (Tu-W) — *E. Stokes, J. Bardwell, J. Brown, G. Hunter, K. C. Mishra, and P. Shen*

F—Electrochemical/Chemical Deposition and Etching

- F1 — Current Trends in Electrodeposition (An Invitational Symposium) (W) — *J. Stickney*
F2 — Electrodeposition of Nanoengineered Materials and Alloys 2 (M-Tu) — *N. Myung, J. Mallett, R. Penner, E. Podlaha-Murphy, J. Talbot, N. Tao, and G. Zangari*
F3 — Stress Related Phenomena in Electrochemical Systems (Tu-Th) — *G. Stafford and J. Scully*

G—Electrochemical Synthesis and Engineering

- G1 — Leadership and Entrepreneurship in Electrochemical Engineering: A Tutorial Symposium (W-Th) — *G. Pillay, R. Savinell, and J. Van Zee*

I—Physical and Analytical Electrochemistry

- I1 — Physical and Analytical Electrochemistry General Session (Tu-W) — *H. De Long, G. Brisard, J. Davidson, C. Henry, P. Hesketh, P. Kamat, R. McCreery, S. Minter, M. Porter, D. Scherson, G. Swain, and A. Wieckowski*
I2 — Electrochemical Scanning Probe Microscopy: From Theory to Real-World Applications (Tu, Th) — *W. Schuhmann and C. Kranz*

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

- J2 — Physics and Chemistry of Luminescent Materials 16 (Tu) — *A. Srivastava, U. Happek, and K. C. Mishra*
J3 — Sensor, Actuators, and Microsystems General Session (Tu, Th) — *R. Mukundan, S. Bhansali, and M. Carter*
J4 — Sensor Arrays and Multi-Dimensional Sensor Systems (Tu-W) — *J. Stetter, Z. Aguilar, P. Hesketh, V. Lvovich, M. Orazem, and P. Vanýsek*

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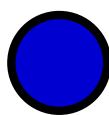
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Event Highlights

NOTE: For a list of Committee Meetings, please visit the Washington, DC meeting page: www.electrochem.org/meetings/biannual/212/212.htm.

SUNDAY, OCTOBER 7

- 0900h..... Short Courses begin
1830h..... For the Rest of Us — "Understanding Non-Conventional Photovoltaic Cells," Laurie Peter, Lincoln East/West, Concourse Level
1900h..... Electronics and Photonics Division Award Reception and General Meeting, Caucus, Terrace Level (No ticket required.)
1930h..... Sunday Evening Get-Together, International Terrace, Terrace Level

MONDAY, OCTOBER 8

- 0730h..... Technical Registrants' Continental Breakfast, International Terrace, Terrace Level
0800h..... Plenary Session, International Ballroom Center, Concourse Level—ECS Lecture: "The Origins of and Imperative for Green IT," Bernard S. Meyerson; and the Olin Palladium Medal Award Lecture: "An Excursion to the Heart of Electrochemistry," Sergio Trasatti
1000h..... Coffee Break, International Terrace, Terrace Level
1215h..... Battery Division Luncheon & Business Meeting, International Ballroom West, Concourse Level; tickets are \$24 in advance, \$28 onsite, non-refundable
1215h..... High Temperature Materials Division Luncheon & Business Meeting, 1919 Grill, Lobby Level; tickets are \$24 in advance, \$28 onsite, non-refundable
1800h..... Monday Evening Mixer, Student Poster Session, and Technical Exhibit Opening, Exhibit Hall, Concourse Level

TUESDAY, OCTOBER 9

- 0900h..... Technical Exhibit, Exhibit Hall, Concourse Level
0930h..... Coffee Break, Exhibit Hall, Concourse Level
1200h..... Student Poster Award Presentation, Exhibit Hall, Concourse Level
1215h..... Corrosion Division Luncheon & Business Meeting, Cabinet, Concourse Level; tickets are \$24 in advance, \$28 onsite, non-refundable
1215h..... Sensor Division Luncheon & Business Meeting, 1919 Grill, Lobby Level; tickets are \$24 in advance, \$28 onsite, non-refundable
1800h..... Olin Palladium Award Reception, Cabinet, Concourse Level
1900h..... Technical Exhibit and General Poster Session, Exhibit Hall, Concourse Level

WEDNESDAY, OCTOBER 10

- 0900h..... Technical Exhibit, Exhibit Hall, Concourse Level
0930h..... Coffee Break, Exhibit Hall, Concourse Level
1215h..... Electrodeposition Division Luncheon & Business Meeting, Conservatory, Terrace Level; tickets are \$24 in advance, \$28 onsite, non-refundable
1215h..... Luminescence & Display Materials Division Luncheon & Business Meeting, 1919 Grill, Lobby Level; tickets are \$24 in advance, \$28 onsite, non-refundable
1800h..... Corrosion Division Award Reception, Kalorama, Terrace Level; tickets are \$10 in advance, \$12 onsite, non-refundable
1900h..... Battery Division Award Reception, Conservatory, Terrace Level; tickets are \$10 in advance, \$12 onsite, non-refundable

THURSDAY, OCTOBER 11

- 0930h..... Coffee Break, Concourse, Concourse Level and International Terrace, Terrace Level

FRIDAY, OCTOBER 12

- 0930h..... Coffee Break, Concourse, Concourse Level

7th NSF-MEXT US Japan Workshop on Nanotechnology: Fuel Cell and Related Technologies

The U.S. National Science Foundation (NSF) and the Ministry of Education, Culture, Sports, and Technology (MEXT) of Japan are conducting the 7th NSF-MEXT U.S. Japan Workshop on Nanotechnology: Fuel Cell and Related Technologies from October 4-7, 2007 at the Hilton Washington. The focus will be on the progress and future challenges of materials and material issues confronting fuel cell and hydrogen storage development and commercialization. Since nanoscale processes and material characteristics play an important role in fuel cell performance, understanding at this length scale will be a particular focus of this workshop. For additional information, please contact Robert Savinell at rf2@cwru.edu.

Hotel & Travel Information

Hotel Reservation Information—The Hilton Washington Hotel, located at 1919 Connecticut Avenue NW, Washington, DC 20009, is the headquarters hotel for the meeting and all meeting functions will take place there. We encourage you to stay at the Hilton Washington, where your stay will be most enjoyable and convenient. Guestroom reservations for the Hilton Washington can be made online from the ECS website. The discounted meeting rates are as follows.

Single \$198.00.....Double \$218.00

A block of rooms has been reserved for October 7-12, 2007. The special room rate will be available until September 5th, or until the group block is sold-out, whichever comes first. Guests wishing to arrive early may do so starting October 4th and depart as late as October 15th, based on availability. Reservations attempted after September 5 will be accepted on a space and rate availability basis. A deposit equal to your first night's stay is required to guarantee your reservation. Cancellation must be received 72 hours before expected arrival for a full refund of your deposit.

Ground Transportation—SuperShuttle ground transportation service is available from Reagan National, Dulles and BWI airports to the Hilton Washington. Simply download and print the special discount coupon from the ECS Website and present it at the SuperShuttle counter at the airport. Prepaid reservations can be made online from the ECS website or www.supershuttle.com, using the discount code #9JBVS.

Companion Registrants (Formerly "Nontechnical Registrants")—All family members and other guests of technical registrants are invited to register for the meeting as a Companion Registrant. The registration fee of \$25 (Advance) or \$30 (Onsite) includes admission to Society social events (not including technical sessions), and an exclusive lounge with beverage service, Monday through Thursday, 08:00-10:00h. Companion Registrants may make their own meal and activity arrangements using the hotel concierge located in the Hilton Washington lobby. Please note that online registration is not available for Companion Registrants. For your convenience, you may download, print and fax the form available on the ECS website.

Technical Program

Symposium Organizer and Co-Chair Orientation—We encourage all Symposium Organizers and Technical Session Co-Chairs to attend this important informational session in Hemisphere on the Concourse Level, from 1500-1700h. The Co-Chair Orientation will take place during the first 10 minutes of the meeting.

Oral Presentations and Audio-Visual—Oral presentations must be in English. Only LCD projectors will be available for oral presentations. Authors will be required to bring their own laptop computers for presentation. Presenting authors should verify laptop/projector compatibility in the speaker ready room at the meeting. Speakers requiring special equipment must make written request to ECS headquarters (meetings@electrochem.org) no later than two weeks before the meeting, and appropriate arrangements will be made at the expense of the author. Visit the ECS website for other details about author presentations.

Poster Presentations and Sessions—Poster presentations must be in English, on a board approximately 4 feet high by 8 feet wide (1.22 m by 2.45 m), corresponding to the abstract number and day of presentation in the final program. Visit the ECS website for other details on Poster Session requirements. Please arrive approximately two to four hours before the start of your session to begin setting up your poster displays. Please do not begin setting up your poster until all the poster boards have been numbered. The **GENERAL SOCIETY STUDENT POSTER SESSION** will be held as a part of the Monday Evening Mixer and Technical Exhibit, which features instruments, materials, systems, publications, and software of interest to meeting attendees. All meeting registrants are invited to attend. Formal presentations will begin at 1800h. Students may start setting up their presentations in the exhibit hall at 1400h; judging of the posters will begin at 1700h.

Speaker-Ready Room—A Speaker-Ready Room will be available Sunday through Friday, in Convention Office #3 on the Concourse Level. This room is available to allow speakers the opportunity to preview and prepare for their presentations. We highly recommend that speakers verify their laptop's compatibility with the sample LCD projector that will be located in this room, prior to their presentation. Additionally, there will be audiovisual technicians available on each level of the Hotel for your assistance.

Speaker Indemnification—The ideas and opinions expressed in the technical sessions, conferences, and any handout materials provided are those of the presenter. They are not those of The Electrochemical Society, nor can any endorsement by ECS be claimed.

No Recording Allowed—Photographing and/or recording of presentations IS NOT PERMITTED unless specifically allowed by the speaker. Anyone making unauthorized photographs or recordings will be asked to leave the session.

Registration & General Meeting Information

Meeting Registration—The meeting registration area will be located in the Concourse, on the Concourse Level of the Hilton Washington. Registration will open on Sunday and the technical sessions will be conducted Sunday through Friday.

Advance Registration—Advance registration is encouraged. Register online at www.electrochem.org; or print out the Advance Registration form from the website, and send to: The Electrochemical Society, 65 South Main Street, Pennington, NJ 08534, USA, Fax: 1.609.737.2743. Attendees prepaying by credit card are encouraged to use our online system, or send the form by fax. If you send a registration by fax, please do not send another copy by mail, as this may result in duplicate charges. The deadline for advance registration is September 5, 2007. Refunds are subject to a 10% processing fee and will only be honored if written requests are received by September 12, 2007. All participants of the 212th ECS Meeting are required to pay the appropriate registration fees. Advance and onsite payments must be made in U.S. Dollars via Visa, MasterCard, American Express, check or money order payable to ECS.

Key Locations

Meeting Registration Concourse, Concourse Level
 Information/MessageCenter Concourse, Concourse Level
 ECS Headquarters Office State, Terrace Level

Speaker Ready Room..... Convention Office #3, Concourse Level
 Development Office..... Convention Office #4, Concourse Level

Registration Hours

Sunday, October 7 0800-1830h
 Monday, October 8 0730-1730h
 Tuesday, October 9 0730-1600h
 Wednesday, October 10 0730-1500h
 Thursday, October 11 0730-1500h
 Friday, October 12 0730-1300h

Registration Fees—ALL PARTICIPANTS AND ATTENDEES ARE REQUIRED TO PAY THE APPROPRIATE REGISTRATION FEE LISTED BELOW. Payment can be made by cash, check or travelers' checks in U.S. funds drawn on a U.S. bank. Visa, MasterCard or American Express are also accepted.

	Advance	Onsite
Member	\$395	\$495
Nonmember	\$599	\$699
Student Member	\$145	\$245
Student Nonmember	\$185	\$285
One Day Member.....	\$270	\$370
One Day Nonmember	\$355	\$455
ECS Emeritus & Honorary Member	\$0	\$0
Companion Registrant	\$25	\$30

All students must present verification of student eligibility in order to pick up their registration materials onsite. All technical registrations include a copy of Meeting Abstracts (on CD-ROM only). Attendees who wish to have paper copies of abstracts in advance of the meeting should download copies from the ECS website, free of charge.

Financial Assistance—Financial assistance is 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.

Employment Services—Companies desiring to recruit employees may place their announcements on a designated bulletin board in the registration area. Please note that these announcements should be no larger than 8 1/2" by 11".

ADA Accessibility—Special accommodations for disabled attendees will be handled on an individual basis provided that adequate notice is given to the ECS headquarters office.