Vienna

216th ECS Meeting

with

EuroCVD 17 and

SOFC XI - 11th International Symposium on Solid Oxide Fuel Cells

Vienna, Austria ✦ October 4-9, 2009

Special Meeting Section

EUROCVD SEVENTEEN

ECS®

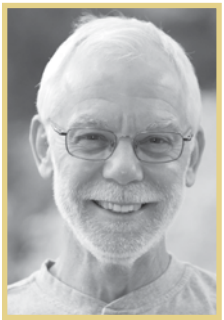
SOFC XI

welcome

Welcome to Vienna*—the "city of music," where more famous composers have lived, including Mozart, Beethoven, Schubert, and Johann Strauss, than in any other city. We are pleased to venture into this city for the 216th ECS Meeting, the17th European Conference on Chemical Vapor Deposition (EuroCVD 17) and the 11th Symposium on Solid Oxide Fuel Cells (SOFC XI). This major international conference will be held at the Austria Center Vienna, and will include 44 topical symposia consisting of 3,196 technical presentations. You are invited to participate not only in the technical program, but also in the other social events planned for the meeting.*

Featured Speakers

Sunday, October 4



For the Rest of Us…
1830h, Hall H, Level U2-Blue

Electrochemistry and the Performance Assessment of Nuclear Waste under Permanent Disposal Conditions

by David Shoesmith

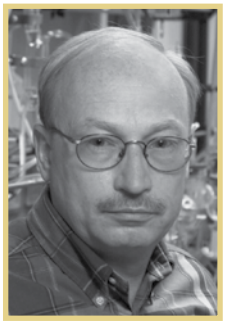
All national programs for the permanent disposal of high level nuclear waste involve its containment within a deep geological repository. These repository concepts are based on multiple barriers to radionuclide release with no common mode of failure. Within this sequence, the waste form itself (most commonly the spent fuel discharged from a reactor) and the metallic container within which it is sealed are the key engineered (as opposed to natural geologic) barriers. The key geological property controlling container corrosion, and waste form corrosion inside a failed container, will be the groundwater redox condition that will evolve with time as environmental oxidants in the groundwater are consumed and the radiation fields that produce radiolytic oxidants (via the decomposition of water primarily within a failed container) decay. Models must be capable of assessing with reasonable certainty the evolution of repository behavior from the initial excavated damaged state to the original undisturbed state. Given the long time frames involved (103 to 106 years) this is a unique challenge for engineered structures.

Electrochemical approaches, coupled to a wide range of supplementary analytical and spectroscopic methods, have been applied to this task. This presentation will illustrate how electrochemical methods have been used to: (1.) develop the mechanistic understanding of materials corrosion processes; (2.) generate the databases essential for model development; (3.) provide the framework for the computational models capable of predicting the evolution of corrosion damage with time and estimate the lifetimes of waste containers and the release rates of radionuclides; and (4.) provide the essential feedback required for the engineering design of optimized barriers able to provide adequate performance at reasonable cost.

David Shoesmith is a professor in the Department of Chemistry at the University of Western Ontario (London, ON, Canada) and specializes in research on the electrochemistry, surface analysis, and corrosion of materials. He has held this appointment since June 1, 1998, and is the Canadian Natural Sciences and Engineering Research Council and Nuclear Waste Management Organization (NSERC/NWMO) Industrial Research Chair holder in Nuclear Fuel Disposal Chemistry (since November 2000). Initially a five-year appointment, this chair was renewed for a further five years in November 2005. Previously, he worked for Atomic Energy of Canada Ltd. for 25 years, achieving the rank of principal scientist. Since 1980 he has been an active researcher in the Canadian Nuclear Waste Disposal Program, and is a recognized international expert on waste form and waste container issues. He is an elected fellow of the National Association of Corrosion Engineers (1996) and the Canadian Society for Chemistry (1985). He has won awards from ECS (Lash Miller), the Canadian Society for Chemistry, the Canadian Institute of Mining and Metallurgy (Cohen Award), Atomic Energy of Canada (Discovery Award), and a University of Western Ontario Distinguished Professorship. He is currently funded by waste management organizations

in Canada, Sweden, and Switzerland. He has served on program review boards in Switzerland, USA, and France, and as a consultant on corrosion issues for many nuclear and non-nuclear companies. He has written over 350 publications, 210 of which are in refereed journals and conference proceedings.

Monday, October 5



Plenary Session
0730h, Hall D, Level U2-Blue

The ECS Lecture

Electrochemical Design of Novel Zinc Alloys for the Corrosion Protection of Steel

by Martin Stratmann

Novel zinc alloy coatings containing Mg and other additives are the subject of current cutting edge research in corrosion science as they seem to possess significantly improved corrosion properties. In this presentation, not only the latest results on zinc and its alloys are shown, but a vision of systematic coating development will be given.

Martin Stratmann studied chemistry at the Ruhr Universität Bochum and received his diploma in 1980. In 1982, at the Max-Planck-Institut für Eisenforschung in Düsseldorf (H. J. Engell, Director), he finished his PhD on electrochemical studies of phase transformations in rust layers; and he spent his postdoctoral studies with Ernest Yeager at Case Western Reserve University. The habilitation in Physical Chemistry followed in 1992 at the University of Düsseldorf with electrochemical studies on metal surfaces covered with ultrathin electrolyte layers. 1994 he took over the Chair in corrosion science and surface engineering at the University of Erlangen, and since 2000 he has been a scientific member of the Max Planck Society and Director of the Max-Planck-Institut für Eisenforschung in Düsseldorf, leading a department of interface chemistry and surface engineering. He is also a faculty member of the Materials Science Department and of the Chemistry Department at the Ruhr-Universität Bochum.

Prof. Stratmann's research interests lie in the area of corrosion-related electrochemistry with an emphasis on microscopic aspects and *in situ* spectroscopy, electrochemistry at buried metal/polymer interfaces (an area where he pioneered novel electrochemical techniques), atmospheric corrosion, adhesion, and surface chemistry of reactive metal substrates. He has received a number of awards, among others the Otto-Hahn medal of the Max Planck Society, the T. P. Hoar Award (twice), the Masing Award of the German Society of Materials Science, the DECHEMA Award of the Max Buchner Forschungsstiftung, the U. R. Evans Award of the Institute of Corrosion, and the W. R. Whitney Award of the International Association of Corrosion Engineers. In 2008, he received the H. H. Uhlig Award of the ECS Corrosion Division. Prof Stratmann is an ECS Fellow and a member of the North Rhine-Westphalia Academy of Science and of the Austrian Academy of Science.

In 2008, on Prof. Stratmann's initiative, the International Centre for Advanced Materials Science (ICAMS) was founded in Bochum. He served as chair of the Chemistry, Physics, and Technology Section of the Max Planck Society from 2006 to 2008. In 2008 he was elected Vice-President of the Max Planck Society; with this position he also became an executive of the Minerva Foundation. He has published about 170 papers, various monographs, and together with Allen Bard he edited the *Encyclopedia of Electrochemistry* in ten volumes.

ECS Carl Wagner Award Lecture
1350h, Hall N, Level 01-Green

Electrochemistry in Synthetic and Biological Nanopores

by Henry White

Prof. White's talk will describe recent investigations of molecular and particle transport in synthetic nanopores and protein ion channels. The work of his research group has focused on the use of nanopores for single molecule detection, particle analysis, and sequencing of biopolymers (*e.g.*, DNA) using glass and quartz nanopore membranes.

Henry S. White received a BS in chemistry from the University of North Carolina (1978) and a PhD in chemistry from the University of Texas (1983). Following a postdoctoral appointment at the Massachusetts Institute of Technology, he joined the faculty of the Department of Chemical Engineering and Materials Science at the University of Minnesota. During a nine-year period at Minnesota, he was a McKnight and a Shell Professor of Chemical Engineering. In 1993, he moved to the University of Utah, where he is currently is Distinguished Professor and Chair of the Department of Chemistry.

Prof. White and his students have made contributions in several areas of electrochemistry including pioneering research on electrochemistry using nanoscale electrodes, and the development of a theory describing voltammetry of surface-confined redox and acid-based molecules and molecular transport within electrical double layers. White and coworkers developed scanning electrochemical microscopy to visualize and identify transport pathways through human skin and contributed to materials synthesis in microfluidic channels, demonstrating the application of laminar flow streamlines to control the growth of polymer fibers. His group recently developed an ion channel recording platform based on nanometer-scale orifices in glass membranes that is being applied for DNA sequencing and stochastic sensors.

Prof. White is a past Vice-Chair and Chair of the ECS Twin Cities Section, and has organized a number of ECS symposia over the past 25 years. He is currently an Associate Editor of the *Journal of the American Chemical Society*. Prof. White has been recognized for educational contributions at the University of Utah, including the W. W. Epstein Outstanding Educator Award and the Associated Students of the University of Utah Teaching Award. He is actively involved in undergraduate research, having supervised ~50 undergraduates and high school students over a 25-year period. He is the recipient of the D. C. Grahame Award of the ECS Physical Electrochemistry Division, the C. N. Reilley Award of the Society of Electroanalytical Chemistry, the Faraday Medal of the Royal Society of Chemistry (Electrochemistry Group), and the ACS Analytical Division Award in Electrochemistry.

Tuesday, October 6

Olin Palladium Award Lecture
1700h, Hall F1, Level OE-Yellow

The Metal-Solution Interface: What We Know and What Needs to Be Done

by Dieter M. Kolb

The electrode–electrolyte interface constitutes the heart of electrochemistry; it is the place where electrochemical reactions take place via an electron or ion transfer. Although for many cases the

simple model of a plate condensor appears to be sufficient, a more detailed understanding of the double layer structure seems desirable. Starting from the Helmholtz model, questions about the exact potential distribution across the double layer, particularly in the case of specific adsorption, are addressed. It is demonstrated how the electrochemical shift in X-ray photoelectron spectroscopy or surface state spectroscopy can help to gain new information. Impedance spectroscopy has been successfully employed to elucidate the double-layer behavior of reactive metals like Pt, Rh, or Ir in aqueous solutions. Although water undoubtedly constitutes the most important solvent, little is known about the physical properties of the interfacial water and dependence on the electrode potential. Finally, a first glimpse on double-layer capacities for metals in contact with ionic liquids is offered.

Dieter M. Kolb studied physics at the Technical University of Munich, where he did his thesis work under the supervision of the late Prof. Heinz Gerischer on ESR of electrochemically generated radical anions. After receiving his doctorate in 1969 he spent two years at Bell Laboratories in Murray Hill, NJ, studying the optical properties of electrode surfaces by *in situ* reflectance spectroscopy in the UV-Vis range. In 1971 he again joined Heinz Gerischer, then at the Fritz-Haber-Institut der Max-Planck-Gesellschaft in Berlin, where he took a position as a group leader to perform research in electrochemical surface science, using a wide variety of structure-sensitive techniques to study the metal–electrolyte interface at an atomic level. At the same time, Dr. Kolb conducted research on matrix-isolated metal atoms and clusters, including synchrotron radiation studies, at BESSY. In 1990 he left the Fritz-Haber-Institut and accepted the offer of a full professorship at the University of Ulm, where he is now Director of the Institute of Electrochemistry.

Professor Kolb's research activities are directed toward a molecular understanding of electrochemical processes at metal electrodes, including surface reconstruction, structural transitions in adlayers, metal deposition and dissolution, structure–reactivity relations in electrocatalysis, and nanostructuring. He is the author of over 300 technical papers in refereed journals and books. Dr. Kolb has been honored in the past by being named recipient of the 1980 Haber prize of the Deutsche Bunsengesellschaft, the 1990 Pergamon Gold Medal of the International Society of Electrochemistry, the 1997 D. C. Grahame award of the ECS Physical and Analytical Electrochemistry Division, the 2000 Luigi Galvani medal of the Italian Chemical Society, the Walther-Nernst-Denkmünze of the Deutsche Bunsengesellschaft, the 2002 ECS Electrodeposition Division Award, and the 2003 Faraday Medal of the Royal Society of Chemistry. He was president of the International Society of Electrochemistry (2003-2004) and head of the evaluation committee for chemistry of the Deutsche Forschungsgemeinschaft (2000-2004). He is a Fellow of ECS and the International Society of Electrochemistry, and a Corresponding Member of the National Academy of Sciences, Argentina.

2009 Olin Palladium Award Reception—All meeting attendees are invited to attend the award reception honoring Dieter M. Kolb, recipient of the 2009 Olin Palladium Award, on Tuesday, October 6, 1800-1845h, in Rondo, Level OE-Yellow (no ticket required).

Short Courses & Workshops

Seven Short Courses will be offered in conjunction with the 216th ECS Meeting. These courses will be held on Sunday, October 4, 2009, from 0900h to 1630h. The registration fee is $510 ($425 + $85 VAT) for ECS Members, and $624 ($520 + $104 VAT) for Nonmembers. **Students are offered a 50% discount; the registration fees are as follows. For ECS Student Members: $255 ($212.50 + 42.50 VAT), and for Nonmember Students: $312 ($260 + 52 VAT).** The registration fee for the course covers the course, text materials, continental breakfast, luncheon, and refreshment breaks; it does not cover the meeting registration, and it is not applicable to any other activities of the meeting. **The deadline for registration for a course is August 28, 2009.** Interested parties may register using the Advance Registration Form on the ECS website. Written requests for refunds will be honored only if received at ECS headquarters before September 4, 2009. **Pre-registration is required. All courses are subject to cancellation pending an appropriate number of advance registrants. Before making any flight or hotel reservations, please check to make sure the course is running!**

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

Short Course #1

Basic Impedance Spectroscopy

M. 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. 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 #2

PEM Fuel Cells

H. Gasteiger and T. J. Schmidt, Instructors

This course develops the fundamental thermodynamics and electrocatalytic processes critical to polymer electrolyte membrane fuel cells (PEMFC). Topics will include relevant half-cell reactions, their thermodynamic driving forces, and their mathematical foundations in electrocatalysis theory. This theoretical framework will be applied to catalyst characterization and the evaluation of kinetic parameters. Also covered will be the different functional requirements of actual PEMFC components and basic in situ diagnostics. This will be used to develop an in-depth understanding of the various voltage loss terms that constitute a polarization curve. Also described will be the 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

Operation and Applications of Electrochemical Capacitors

J. Miller, Instructor

Electrochemical capacitors, sometimes called supercapacitors or ultracapacitors, offer extraordinarily high power density compared with batteries, as well as high cycle-life and maintenance-free operation. Capacitor technology is being used to increase the energy efficiency of industrial equipment like fork lifts, earth-moving vehicles, and overhead cranes by capturing energy that is normally wasted. Systems developed specifically for power quality applications are appearing. The fundamentals part of the lecture covers the nature and significance of electrical double layer and pseudocapacitance charge storage and compares and contrasts these charge storage mechanisms with traditional capacitor and battery technologies. Basic design rules for electrochemical capacitor components are covered.

Short Course #4
Lithium Ion Battery Materials
Y. Shirley Meng, Instructor

Designing better materials for rechargeable lithium batteries requires understanding of the many physical processes that determine their performance. The aim of this course is to provide a foundation for understanding key materials science and engineering issues underpinning the behavior of electrode and electrolyte materials for rechargeable lithium batteries. With the relevant examples, the course will further illustrate how the direct integration of first principles computation with experimental research can accelerate the pace and efficiency of discovering new higher energy/power density materials for electrochemical energy storage.

Short Course #5
Atomic Layer Deposition
A. Londergan, Instructor

Recent advancements in nanotechnology have created a need for precise, conformal atomic level deposition of thin film materials. Atomic Layer Deposition (ALD) can enable the precise deposition of ultra-thin, highly conformal coatings over complex 3D topography, with controlled composition and properties. Consequently, ALD has become a technology of choice for a large variety of applications for and beyond the semiconductor industry, as proven from the countless applications emerging.

Short Course #6
Basics of Cleaning Processing for IC Manufacturing
K. Reinhardt and R. Small, Instructors; T. Bearda and P. Mertens, Special Contributors

The course is intended to provide an overview of current challenges and the technical advances associated with wet cleaning, plasma stripping, and other surface conditioning technologies used in the manufacture of integrated circuits. The following topics will be covered: advances in high-k/metal gate cleaning, in single wafer cleaning, in wet chemical residue removal, in high aspect feature cleaning and drying, and in high dose implant stripping; overviews of Cu/low-k post-etch and post-CMP cleaning and pore sealing, of advances in critical cleaning, of passivated surfaces; and coverage of damage-free particle removal and photovoltaic processing.

Short Course #7
Electrodeposition Principles and Practice
S. Roy and G. Zangari, Instructors; W. Hansal, Guest Lecturer

Electrodeposition is a simple but powerful film deposition technique that is increasingly being used in the fabrication of materials systems and devices, and in many instances, by those who have limited formal preparation in the subject. This course will offer the opportunity to students and researchers alike to either be introduced to or to refresh the fundamentals of the subject. The approach will be rigorous but geared toward applications. Attendees will have the opportunity to learn practical aspects of this technology; in particular, lectures on the electrodeposition of noble and transition metals, nanomaterials, and pulse plating are included.

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 Room B552, Level 02-Red.

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

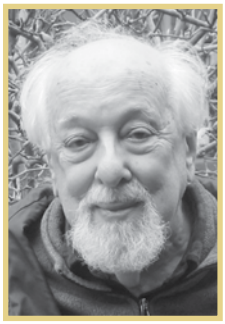
Job Interviewing Tips—How to improve your chances of impressing the interviewer; key questions to ask; and other important pointers for the interviewing process. Sunday, 1600-1645h and Monday, 1300-1345h

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/216/216.htm.*

2009 Class of ECS Fellows



Vladimir Bagotsky graduated in 1944 from the Chemistry Department of Moscow State University. In 1947 he received his PhD in electrochemistry (under Prof. A. N. Frumkin). As a postdoc he took a substantial part in writing (together with Profs. Frumkin, Iofa, and Kabanov) the monograph *Kinetics of Electrode Processes* (1952) that became the first book on electrochemical kinetics in the world.

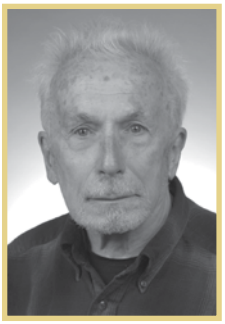
After being fired in 1952 from the University (during the notorious campaign against cosmopolitans in the Soviet Science), he was forced to switch to applied electrochemistry. At the industrial Quant Power Sources Institute in Moscow, Dr. Bagotsky began the development of new types of batteries. Industrial production of these batteries was organized under his direction in 1954. In 1955 Dr. Bagotsky was given the responsibility for developing batteries for ICBMs and some types of satellites. The first Russian satellite known as Sputnik-1 contained a battery developed by him and assembled under his personal supervision. In 1956 he took part in the preparation of the mission of the first Kosmonaut Yuriy Gagarin, being responsible for the battery part of this mission. For these activities Dr. Bagotsky was awarded in 1959 the degree of Doctor of Sciences without thesis (analogous to a Dr. h.c.).

In 1960, Dr. Bagotsky resumed his research in the field of electrochemical kinetics. At the Institute of Electrochemistry of the Academy of Sciences of the USSR (now A. N. Frumkin Institute of Physical Chemistry and Electrochemistry of the Russian Academy of Sciences), Dr. Bagotsky's group (Dr. Yurij B. Vassiliev, *et al.*) performed investigations in the field of electrocatalytical oxidation of methanol and other simple organic compounds on platinum electrodes. It was shown that these reactions proceed via a first dehydrogenation step with a subsequent interaction of the chemisorbed organic residue with oxygen-containing adsorbed species. These views and the role of Dr. Bagotsky in their development are now generally recognized.

Another direction of Dr. Bagotsky's group was connected with research in the field of porous electrodes. In this group (Dr. Yurij M. Volfkovich, *et al.*), the method of standard contact porosimetry was developed, which played an important role for optimizing fuel cells and other electrochemical devices.

From 1962 to 1976 Dr. Bagotsky was a deputy to Prof. A. N. Frumkin as head of the Scientific Council on Fuel Cells of the USSR Academy of Sciences. In this capacity he organized three national Meetings on Fuel Cells.

For political and security reasons ("bearer of classified information") he was for a long time barred from visiting foreign countries and participating in international scientific meetings. After moving for health reasons to California he wrote a new revised and enlarged second edition of his monograph, *Fundamentals of Electrochemistry*, which was published in 2005. In 2009 his new book *Fuel Cells: Problems and Solutions* was published. Both books became a part of The Electrochemical Society Monograph Series, sponsored by ECS and published by John A. Wiley & Sons.



Ugo Bertocci began his career as an assistant professor at the Institute of Electrochemistry of Milan Polytechnic in 1950. He was involved in the improvement of measurement methods related to electrochemical kinetics, a topic of considerable interest at the time. The Institute was among the first in the world to initiate the study of the electrochemical behavior of metal single crystals and the structural sensitivity of reactions thereof.

In 1961 Dr. Bertocci joined the Solid State Division at Oak Ridge National Laboratory, working on the influence of surface and defect structure on the electrochemical behavior of Cu single crystals, nucleation processes in electrocrystallization, and computer simulations of certain aspects of crystal growth.

In 1971 he joined the Corrosion Group at the National Bureau of Standards (now NIST). There he worked in various projects concerning new electrochemical methods for the study of corrosion processes. Activities ranged from the measurement and interpretation of photopotentials on copper oxides, to the effect of alternating voltages on corrosion rates, an area of practical interest for underground corrosion. He also investigated the breakdown of passive films and stress corrosion cracking. During this time he was also involved in the measurement and interpretation of impedance spectroscopy and in the application of random fluctuation analysis to corrosion studies.

Dr. Bertocci retired from NIST in 1992 but he continued working, first, as a consultant at the Federal Highway Administration (FHA) and subsequently, as an invited scientist at Laboratory "Physique des Liquides et Électrochimie" of the French CNRS in Paris. At FHA the effectiveness of corrosion inhibitors added to commercial highway deicing salts was evaluated using electrochemical impedance spectroscopy and electrochemical noise analysis. In cooperation with Dr. F. Huet of the French CNRS, a model for the interpretation of some aspects of random noise in corroding systems was developed. This work continued at CNRS where, from a combination of experimental and theoretical work on electrochemical noise (EN), they developed the concept of noise resistance, a quantity derived from the analysis of the random fluctuations of current and potential in corroding systems. This work has shown the close connection between EN and electrochemical impedance spectroscopy, putting EN on a firm theoretical ground, and contributing to its establishment as a practical experimental method with commercial applications for corrosion monitoring in the laboratory and in the field.

Since 1996, Dr. Bertocci has been a consultant to the Thin Film and Nanostructure Processing Group at NIST, working on a variety of topics dealing with the composition and properties of oxide films on Cu, thin film stress, nanogravimetric measurements of underpotential and overpotential deposition of heavy metals and most recently, the deposition of electrocatalytic Pt alloys. In January 2009, Dr. Bertocci was elected a Fellow of the AAAS.

Manfred Engelhardt received a PhD in Solid State Physics from the University of Regensburg, Germany, in 1984. He then joined Siemens (Munich), where he was in charge of the development of plasma etch processes for advanced memory and logic products. He pioneered deep single crystal silicon etching for DRAM storage capacitors and significantly contributed to the elucidation of the reaction mechanisms. In the joint Siemens-Fraunhofer 3D-project he was responsible for unit process development and developed the plasma etch processes for through-silicon-vias. He then was in charge of plasma patterning of new materials for FeRAM and MRAMs and for the company's copper Damascene metallization. He also pioneered techniques to assess plasma damage.

With the founding of Infineon Technologies in 1999 he was with Corporate Research, where his responsibilities included managing the nano interconnect project team, investigating conventional and disruptive interconnect scenarios with down to end-of-roadmap feature sizes. The investigation and electrical characterization of nano interconnects utilizing both Damascene and RIE approaches has substantially contributed to the understanding of size effects in metallic conductors (Al, Cu, W, Ag). The work on copper interconnects insulated by air gaps showed for a first time the importance of barrier films for the mechanical stability, integrity, and reliability of sub-50 nm scaled metallization systems. His group published the first paper indicating a cross-over of the resistivities of copper and aluminum due to size effects.

In 2005 Dr. Engelhardt joined the Development Center of Qimonda in Dresden where he was responsible for Development and Strategy in Plasma Etching.

Since 1986 Dr. Engelhardt has been an active member of ECS and has served on various ECS committees. He has served in organizing ECS symposia and is co-editor of the corresponding proceedings volumes. In 2001 he served as conference chair of the Plasma- and Process-Induced Damage Symposium and is one of the founders of the International Symposium on Integrated Circuit Design and Technology (ICICDT), whose mission is to bridge the gap between design and technology. Dr. Engelhardt has delivered more than 100 presentations at international conferences. He has authored more than 150 reviewed papers and holds 44 patents. During 25 years in the semiconductor industry he has been the supervisor of numerous diploma and PhD students who did both the experimental and the theoretical parts of their theses under his guidance.

Tom Fuller is a professor in the School Chemical & Biomolecular Engineering at the Georgia Institute of Technology. He also holds a joint appointment as a Principal Engineer at Georgia Tech Research Institute (GTRI) where he directs the GT Center for Innovative Fuel Cell and Battery Technologies.

Dr. Fuller received a bachelor of science degree from the University of Utah in chemical engineering in 1982. After completing his undergraduate studies, Dr. Fuller served for five years in the U.S. Navy in the submarine force working as a nuclear engineer. He continued to serve in the Naval Reserve and retired at the rank of Commander in 2001. In 1992 he obtained a PhD from the University of California, Berkeley, also in chemical engineering. Subsequently, Dr. Fuller developed advanced lithium batteries when working as a postdoctoral fellow at Lawrence Berkeley National Laboratory. He then moved to United Technologies Corporation in 1993. As a senior engineer he was Principal

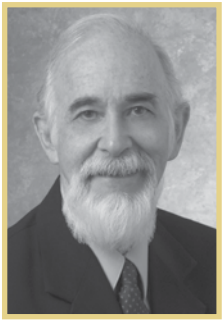
Investigator for DARPA and DOE programs in direct methanol fuel cells. In subsequent assignments Dr. Fuller was manager and then director of engineering. He was responsible for technology development, design, assembly, and test of cell stacks for UTC Fuel Cells.

His research group at Georgia Tech is focused on durability challenges for electrochemical systems such as fuel cells and batteries. Fundamental understanding of the physical phenomena serves as a guide to the development of new materials and systems solutions to mitigate degradation in batteries and fuel cells. This research is a blend of experiments and mathematical modeling. In addition to his research, Dr. Fuller is the faculty advisor for GT EcoCAR team, a student led competition to developed advanced hybrid technologies.

Dr. Fuller is active in ECS, he is a past Chair of the Energy Technology Division, and for a number of years chaired the Fuel Cell Coordinating Group. Fuller has also served on the Honors and Awards Committee, the Nominating Committee, and the New Technology Subcommittee. In 2008 he received the Research Award from the Energy Technology Division. In July 2009, Dr. Fuller began serving as an Associate Editor for the *Journal of The Electrochemical Society*.

Peter Hesketh graduated with a BSc in electrical and electronic engineering from the University of Leeds, in 1979. He worked at the BBC. Engineering Research Department in Kingswood, Surrey, developing novel electronic circuits for broadcast applications. He was a Thouron Fellow at the University of Pennsylvania, obtaining an MS (1983) and PhD (1987) in electrical engineering. He worked in the Microsensor Group at the Physical Electronics Laboratory of Stanford Research Institute and then Teknekron Sensor Development Corporation before joining the faculty at the University of Illinois in 1990 in the Department of Electrical Engineering and Computer Science. He was Co-Director of the Microfabrication Applications Laboratory from 1995-1998 and Director of the Microfluidics Center 1996-1998.

Prof. Hesketh is currently a professor of mechanical engineering at the Georgia Institute of Technology and Director of the MEMS Group in the School of Mechanical Engineering. He is a past Chair of the ECS Sensor Division and a Fellow of the American Association for the Advancement of Science. His research interests include microfabrication of chemical and biosensors, microvalves, miniature gas chromatography systems, and the use of stereolithography for microsystem packaging. He currently has active research programs on microcantilever sensors, in collaboration with Sandia National Laboratories (Livermore), and NSF-sponsored projects on nanopore biosensors and curriculum development in nanotechnology. He has published over 60 journal papers and edited 15 books on microsystems. He is a member of the AAAS, ASME, ASEE, AVS, ECS, and IEEE.



Uziel Landau is a professor of chemical engineering at Case Western Reserve University, Cleveland, Ohio. Professor Landau's research centers on electrochemical engineering with primary focus on modeling of electrochemical systems and on electrodeposition of advanced materials and structures. Professor Landau is a native of Israel, where he received his BSc (1964) and MSc (1968) degrees from the Technion, the Israel Institute of Technology. He earned his PhD (1975) from the University of California, Berkeley, with Prof. Charles Tobias as a research advisor. After graduating, Dr. Landau joined AT&T Bell Laboratories at Murray-Hill, NJ, developing electroplating processes for the electronics industry. Dr. Landau joined Case Western Reserve University in 1977, where he has recently been nominated Chair of the Chemical Engineering Department.

Professor Landau's research includes the study of deposit distribution and patterning on the macro and micro scales; electrosynthesis of novel compounds, alloys, and semiconductors; evolution of deposit morphology including the effects of plating additives, electrodeposition on non-conductors, electrochemistry of diamond, and the modeling of corrosion processes. Professor Landau has also performed research on various battery and fuel-cells systems. Professor Landau's modeling of current and potential fields has led to the development of the first electrochemical CAD system that is currently being used world-wide for the design of electrochemical systems. His earlier work on roughness evolution in plating introduced the concept of morphological stability to electrodeposition.

Recently, Professor Landau has been involved in research on copper metallization of interconnects on semiconductor wafers, where he has introduced with his student (R. Akolkar) a transient transport model coupled to a multi-additive competitive adsorption mechanism to provide a comprehensive, quantitative model for bottom-up fill of interconnects. This model was verified by additive injection studies, a technique which is now being widely adapted for characterizing multi-additives systems. Prof. Landau has also introduced the low-acidity electrolyte for copper electrodeposition of semiconductor interconnects, a formulation that has become the industry standard for this application.

Professor Landau is a member of ECS and the American Electroplaters Society. Dr. Landau was the 2008 recipient of the Ernest B. Yeager Award of the ECS Cleveland Section for his contributions to the advancement of electrochemistry in the U.S. Midwest and Great Lakes region.

Dolf Landheer received his BSc in chemistry and physics at the University of Waterloo and his MSc and PhD degrees at the University of Toronto (1976), working in the area of molecular and solid state physics and laser spectroscopy. After a Fellowship at Imperial College (U. of London, UK), he worked on electrographic printing with micro-plasmas at Xerox Research Centre of Canada and nearby Delphax Printing Systems. In 1983 he pursued his interest in plasma processing and the effect of plasmas on materials by moving to the Institute for Microstructural Sciences at the National Research Council of Canada, in Ottawa, where he is now a Principal Research Officer. He established the first plasma processing facilities at the Institute for early work on the fabrication of solid state waveguide lasers and detectors based on III-V (GaAs, InP, etc.) and Si-Ge multilayers. He has contributed to understanding plasma processing damage on III-V laser facets and the interfaces of Si, GaAs and InP with silicon nitride and silicon dioxide. Later he studied high-k dielectric layers produced by chemical vapor deposition (CVD) using electron-cyclotron plasma sources, pulsed metal-organic CVD, and atomic layer deposition (Hf and Gd oxide and silicate). Recently he has been working on the fabrication, analysis, and modeling of bio-affinity sensor micro-arrays based on floating-gate field-effect transistors fabricated using CMOS.

Dr. Landheer has published 190 articles in refereed journals and conference proceedings and received seven patents. He was co-chair of the Canadian Semiconductor Conference (2003 and 2005) and has been on organizing committees for symposia for the MRS (2004), the International Workshop on Device Technology (2001), and the Passivity of Metals Conference (2006). His contributions to ECS include the co-

organization of symposia on SiN/SiO_2 thin insulating films (2001, 2003, 2005), High-k Dielectrics (2005-2009), Dielectrics and Engineered Interfaces in Biological and Biomedical Applications (2009), and was lead-organizer for Biosensors, Bioelectronics, and Biomedical Engineering (2005-2006). He is presently Treasurer for the ECS Dielectric Science and Technology Division and an Associate Editor of the *Journal of The Electrochemical Society*.

Thomas P. Moffat is a member of the Thin Film and Nanostructure Processing Group in the Metallurgy Division at the National Institute of Standards and Technology (NIST). He began his research career as an undergraduate student working part time in the laboratory of Barry D. Lichter and William F. Flanagan at Vanderbilt University. He completed his BE and MSc degrees in materials science and engineering in 1982 and 1984, respectively. He then joined Ron Latanision's group in the H. H. Uhlig Laboratory at the Massachusetts Institute of Technology. In 1989 he received a ScD degree for his work exploring the chemical passivity of chromium-based metallic glasses. This was followed by a two year stint as a postdoctoral associate in A. J. Bard's chemistry laboratory at the University of Texas, Austin, studying the corrosion and passivity of metals using scanning tunneling microscopy.

Since joining NIST in 1991 Dr. Moffat's efforts have focused on using electrochemical methods to understand the deposition and performance of thin films. His activities have ranged from the synthesis of strained-layer metallic superlattices to explorations of the coupling between underpotential deposition and 3D alloy formation. His most recent efforts have focused on studying the role of surfactants in morphological evolution during thin film growth with particular attention given to systems that exhibit void-free "superfilling" of recessed surface features. In 2001 he received the Gold Medal of the U.S. Department of Commerce for his work on the mechanism of superconformal copper electrodeposition.

Dr. Moffat was the recipient of the 2006 Research Award of the ECS Electrodeposition Division. To date, he has authored or coauthored more than 125 technical papers. Dr. Moffat has been a member of ECS since 1982. He is active in organizing symposia and has served as an Associate Editor of the *Journal of The Electrochemical Society* as well as *Electrochemical and Solid-State Letters*. He is also involved with the Electrochemical Materials Science Division of the International Society of Electrochemistry, the Materials Research Society, and the American Association for the Advancement of Science. In 2008 he chaired the Gordon Research Conference on Electrodeposition.

Ikuzo Nishiguchi received his BA in 1966, MA in 1968, and PhD in 1971 from Kyoto University. After two years of postdoctoral study at the University of Florida and the Ohio State University, he worked at Prof. T. Shono's group as an assistant professor. He moved to Osaka Municipal Technical Research Institute in 1978. He was invited to Nagaoka University of Technology (NUT) as a full professor in the Chemistry Department in 1966, where he is currently an Executive Director and Vice-President of NUT. During 2003-2006, he was one of the leaders of the two 21st century COE (Center of Excellent) programs of his university.

Dr. Nishiguchi has made numerous contributions to the area of synthetic and industrial organic electrochemistry over 35+ years. He has developed a number of methods for efficient and facile electrochemical single and double C-acylation of activated olefins and carbonyl compounds, highly regio- and stereo-selective C-C bond formation between a carbonyl group, and an isolated C-C double bond thorough electrochemical and Mg (or Zn)-promoted electron-transfer methods. This body of work has received much attention from not only organic electrochemists but also those in organic synthetic chemistry. He has also made tremendous contributions toward the establishment of some industrial electro-organic processes.

Dr. Nishiguchi has been involved in a variety of activities such as administrating scientific societies, editing scientific journals, and organizing international and domestic meetings relating to electro-organic chemistry, such as serving as an executive director during 2003-2005 and as a vice-president of the Society of Synthetic Organic Chemistry (Japan) during 2006-2007. He has also organized two international symposia (ISOETC-2005 and ISOR/Kobe-2006). He has been a committee member of the ECS Organic and Biological Electrochemistry Division. He served as the chair of the Organic Electrochemical Division of The Electrochemical Society of Japan during 2002-2004.

Dr. Nishiguchi has been the recipient of many important awards in synthetic and electro-organic chemistry fields, for example the Manuel M. Baizer Award of the ECS Organic and Biological Division in 2006, the Synthetic Organic Chemistry Award of the Society of Synthetic Organic Chemistry (Japan) in 2008, the 1986 Chemical Technology Award of the Kinki Chemical Society, the Niigata Nippou Culture Award (Academic Section) in 2006, and the 1983 Incentive Award in Synthetic Organic Chemistry (Japan).

Kohei Uosaki is a professor of chemistry in the Graduate School of Science, Hokkaido University. He received his B Eng and M Eng degrees in applied chemistry from Osaka University. He worked at Mitsubishi Petrochemical Co. Ltd. between 1971 and 1978, during that period he studied in the Flinders University of South Australia on "Photoelectrochemical Production of Hydrogen" for his PhD under the supervision of Prof. J. O'M. Bockris for 2.5 years. After postdoctoral work on "Electrochemistry of Metalloproteins" at the Inorganic Chemistry Laboratory, Oxford University, with Prof. H. A. O. Hill, he joined the Chemistry Department of Hokkaido University in 1980 as an assistant professor, was promoted to an associate professor in 1981, and to full professor in 1990. He served as Director of Catalysis Research Center of Hokkaido University between 2000 and 2002. He has been a principal investigator at the International Center for Materials Nanoarchitectonics (MANA) of the National Institute for Materials Science (NIMS) since 2008.

Prof. Uosaki has contributed to a wide variety of fundamental aspects of electrochemistry including photoelectrochemistry of semiconductor electrodes, electrochemical epitaxial growth of metal on well-defined electrode surfaces, and the formation, structure, and functions of self-assembled monolayers. He has been utilizing single crystalline electrodes and novel *in situ* techniques such as STM, AFM, SHG, SFG, electro- and photo-luminescence, SXS, and XAFS. He was a project leader of a Priority Area Research on "Electrochemistry of Ordered Interfaces" (1997-2000), supported by Ministry of Education, Culture, Sports, Science, and Technology, Japan, to which about 100 Japanese electrochemists contributed. In relation to this project, he organized several international meetings on "Electrochemistry of Ordered Interfaces," including one at the 196th ECS Meeting.

Prof. Uosaki has published more than 300 scientific papers, 50 review articles, and 40 books and book chapters, filed

20 patents, and presented more than 100 invited lectures at international meetings. He has been a member of ECS for more than 25 years, co-organized several symposia and regularly presented papers at ECS meetings, and published many papers in the *Journal of The Electrochemical Society* and in the ECS proceeding volumes. He has served as an editor and on the editorial boards of several physical chemistry and electrochemistry journals.

Battery Division Technology Award

Eiji Endoh received BE, ME, and PhD degrees in chemical engineering from Tohoku University. Since 1974, he has worked in the Research Center of Asahi Glass Co., Ltd., where he is currently the team leader of the High Temperature MEA team in the PEMFC project at the Research Center of Asahi Glass Co., Ltd. From 2001 to 2002, he was a visiting professor at Tohoku University; and from 1984 to 1985, he was a visiting scientist at the University of Texas at Austin.

Prof. Endoh invented an exceptionally durable PFSA based composite membrane for PEMFC under high temperature and low humidity operations. The membrane can operate for more than 6,000 hours at 120°C and 50% relative humidity. This achievement has opened up a new era of operating PEM Fuel Cells in the temperature range of near freezing to120°C for an extended period of time.

During the period 1976-1984, he invented highly durable activated cathodes for the chlor-alkali ion-exchange membrane process. The activated cathodes produce 5 million metric tons of NaOH/year and reduce electricity consumption by one billion kWh/year, which is equivalent of eliminating 740,000 tons of CO_2 emissions. During the 1974-1975 year, he researched a wide range of ion-exchange polymers, including perfluorinated ion exchange membranes for PEM Fuel Cells as well as for the chlor-alkali electrolysis process.

Dr. Endoh's professional awards include the Tanahashi Technology Award of The Electrochemical Society of Japan (2008) for developing the highly durable membrane for PEMFCs. In the area of the development of highly durable activated cathodes, Prof. Endoh received a number of awards, including Japan's State Minister of the Environment Award (2006), the New Electrochemical Technology (NET) Award of the ECS Industrial Electrochemistry and Electrochemical Engineering Division (1999), and the Tanahashi Technology Award of The Electrochemical Society of Japan (1991).

Battery Division Research Award

Linda Nazar obtained her BSc (hons) from the University of British Columbia, achieving top standing in her graduating class, and conducting her BSc thesis in the area of inorganic chemistry. She moved on to the University of Toronto to carry out her PhD studies with Prof. Geoffrey Ozin, an internationally recognized pioneer of zeolite materials chemistry. After declining an offer of an NSERC postdoctoral fellowship and work in Prof. Green's lab at Oxford, she accepted one of ten Postdoctoral Fellowships at the Exxon Corporate Research Labs in Annandale, NJ. There, she worked in the Inorganic Materials Division under the stewardship of the group head, Dr. Allan Jacobson (now Robert A. Welch Professor of Solid State Chemistry at the University of Houston).

Dr. Nazar was appointed an assistant professor at Waterloo in 1987, and obtained tenure and was promotion to Associate Professor in 1992. After a sabbatical leave in the Department of Materials Science at UCLA in 1995, she became full professor in 1998. She was awarded a Senior Canada Research Chair in Solid State Materials in 2004. She has spent sabbaticals at UCLA Department of Materials Science; the Institute for Materials in Nantes, France; and at the CNRS Laboratoire de Chemie de Solide in Grenoble, France as a CNRS fellow. She will be carrying out a sabbatical at CalTech as a Moore Distinguished Scholar in 2009-10.

Professor Nazar has served the academic community internally at UW in numerous ways, among these by developing the inorganic solid state chemistry program and nanotech program; and sits on the advisory board of the Waterloo Institute for Nanotechnology, and the Waterloo Institute for Sustainable Energy. In external service, she has served as member and Chair of the NSERC Strategic Grants Committee (1997-2000); as organizer of the Materials Research Society Symposium, "Advanced Materials for Batteries and Fuel Cells"; on the NSERC Discovery Grants Committee (2006-2009); as member, representative of Canada and Chair of the NATO (Brussels) Science for Peace Funding Committee (2006-2009); on the board of the International Meeting for Lithium Batteries (2005-present); as co-organizer of IMLB-15 in 2010; and as recent member of a DOE (USA) panel to chart new directions for Electrochemical Energy Storage.

Professor Linda Nazar is at the helm of a multidisciplinary, internationally-recognized group studying the solid state electrochemistry of inorganic materials, with a specific focus on structural, inorganic-synthetic and physical property studies of new materials for energy storage and conversion. Devices include lithium-ion batteries, supercapacitors, and fuel cells. She is the author of well over 100 chapters and patents and publications. Nearly all her publications are complex combinations of new materials synthesis and detailed electrochemical studies, combined with thorough physical studies using multidisciplinary techniques such as X-ray and neutron diffraction/scattering, solid state NMR, and X-ray absorption spectroscopy. Her research has been continuously supported by Canadian and international grants along with international industrial contracts since 1987.

Corrosion Division H. H. Uhlig Award

John R. Scully is the Charles Henderson Chaired Professor of Materials Science and Engineering and the Co-Director of the Center for Electrochemical Science and Engineering (CESE) in the School of Engineering and Applied Science at the University of Virginia, USA. He has been active in the corrosion field for 30 years and joined the faculty of the University of Virginia in 1990. Previous to this, Dr. Scully was a senior technical staff member in the Metallurgy Department at Sandia National Laboratories and a materials engineer at the Naval Ship Research and Development Center. Professor Scully received a PhD in materials science and engineering from The Johns Hopkins University studying the topics of hydrogen production, adsorption, absorption, and transport in high performance alloys. He subsequently was a visiting scientist at AT&T Bell Laboratories.

Professor Scully has long been devoted to research, engineering, and education in corrosion. In particular, he and his students have focused on the influence of material structure, composition, physical geometry, and environment on aqueous and atmospheric corrosion phenomena including hydrogen embrittlement, stress corrosion cracking, localized corrosion, passivity, and corrosion under coatings. His interests span various materials and coating systems including high

performance alloys, bulk metallic glasses, glass "composite" alloys, and intermetallic compounds. His research efforts in CESE have supported education and training of over 28 MS and 25 PhD degree holders, which include underrepresented groups, as well as 10 post-doctoral researchers. His work reflects fundamental advances in corrosion as found in his archival publications, book chapters, and a co-authored book. Given that corrosion is an applied science, several innovations, practical applications, experimental methods as well as important contributions to national and international failure analyses teams, and industry standards have resulted from his work. He is a Fellow of NACE and ASM. He received the A. B. Campbell and H. H. Uhlig Awards from NACE, the T. P. Hoar Award from the Institute of Corrosion, and the Francis LaQue Award from ASTM.

Electrodeposition Division Research Award

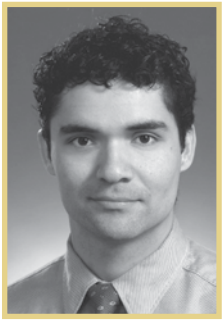
John Stickney received his BS in chemistry from Humboldt State University, 1981, and a PhD from UC Santa Barbara, 1984. His dissertation, "Metal Deposition on Well-Defined Platinum Electrodes," was under Prof. Arthur Hubbard, and involved the first studies of the surface structures formed by underpotential deposition (UPD). He joined the University of Georgia (UGA) in 1985 as an assistant professor.

At UGA, his first studies were of Cu single crystal surfaces in aqueous electrolytes. The intention was to study electrodeposition on Cu surfaces, of significant importance industrially. At that time, he learned of atomic layer epitaxy (ALE) from Prof. Mike Norton, and was encouraged to see if UPD could be applied. The result was a patent in 1994 for electrochemical ALE (EC-ALE). ALE is a subset of atomic layer deposition (ALD), and the development of electrochemical ALD has been the focus of his research since.

ALD is the use of surface limited reactions to form deposits an atomic layer at a time. Surface chemistry is critical to ALD. Initial studies concerned compounds relevant to photovoltaics, such as CdTe, and more recently $CuInGaSe_2$ or CIGS. In addition, with the development of surface limited galvanic displacement by Adzic, Brankovic, *et al.*, it has been possible to form metal nanofilms, greatly expanding the applicability of electrochemical ALD.

Professor Stickney has started a small company (Electrochemical ALD L.C.) to produce ALD equipment and is exploring the range of materials that can be formed. His work focuses on chemistry at the interfaces of electrodeposited metals, semiconductors, etc.

High Temperature Materials Division J. B. Wagner Award



Juan Claudio Nino is an Associate Professor in the Materials Science and Engineering Department at the University of Florida (UF) in Gainesville, FL. He obtained his bachelor's degree in Mechanical Engineering in 1997 at Los Andes University (Bogotá, Colombia). He was a Lecturer at the Colombian Engineering School before joining The Pennsylvania State University in 1998, where he completed his doctoral degree in materials science and engineering in 2002.

After a postdoctoral appointment focusing on ferroelectric thin films at the Materials Research Institute (State College, PA), he joined UF in the fall of 2003 as an assistant professor. Since then, he has established the Nino Research Group (NRG) with a main focus of the investigation of fundamental relationships governing energy-related materials towards enhancing their efficiency, performance, and sustainability. NRG's research investigates ceramics, polymers, bio-inspired materials, and their composites. Current research concentrates on five main areas: (1.) enhancement of electrolytes for intermediate temperature solid oxide fuel cells (SOFCs); (2.) rational design of high temperature proton conducting membranes for hydrogen fuel cells; (3.) determination of structure-property relationships in dielectric ceramics for capacitive (energy storage) applications; (4.) optimization of inert matrix nuclear fuel systems for reducing nuclear waste; and (5.) development of semiconducting ceramics for radiation detection devices.

Dr. Nino has over 50 scientific publications and has given over 50 technical presentations and is Coordinating Editor of the *Journal of Electroceramics* and Associate Editor of the *Journal of the American Ceramic Society*. He is a recipient of the CAREER award by the U.S. National Science Foundation.

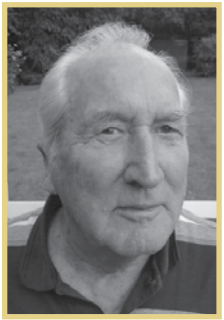
Organic and Biological Electrochemistry Division Manuel M. Baizer Award

Toshio Fuchigami received a BE degree from Gunma University in 1969, and ME (1971) and PhD degrees (1974) from Tokyo Institute of Technology. He was an assistant professor at Tokyo Institute of Technology from 1974 to 1986 and was promoted to associate professor in 1986 and then to full professor in 1998. He is currently as a senator of Tokyo Institute of Technology.

Dr. Fuchigami has made outstanding and remarkable contributions to the field of synthetic organic electrochemistry over the past 30 years. By using fluorine as a key element and employing mediators, he developed new organic electrosynthesis methods for hetero-atom compounds containing sulfur, nitrogen, iodine, and silicon atoms, based on their characteristics. His main work, "Selective Electrochemical Fluorination of Organic Compounds," is widely and internationally recognized. Furthermore, he developed methods for volatile organic compound (VOC) free organic electrosynthesis in ionic liquids. Thus, he has developed the new hybrids fields, "Organofluorine Electrochemistry" and "New Electrolytic Systems toward Green Sustainable Chemistry."

Dr. Fuchigami has published over 270 technical papers, 47 review articles, and 35 book chapters. He has organized numerous symposia at ECS meetings and other international meetings, and he currently serves as an officer of the ECS Organic & Biological Electrochemistry Division and as a chair of the ECS Japan Section. He is also a Chair of the Organic Electrochemistry Division of The Electrochemical Society of Japan. He has served as Editor-in-Chief of *Electrochemistry* (Japan) and as an Associate Editor of the *Bulletin of the Chemical Society of Japan*. He also has served on the editorial boards of the *Journal of Synthetic Organic Chemistry of Japan* and the *Journal of Oleo Science* (Japan). He is a recipient of the Takeda Award for International Achievement (2006), the Excellent Papers Award of The Electrochemical Society of Japan (2007), and The Electrochemical Society of Japan Award (2008).

Gerischer Award of the European Section



Rüdiger Memming, formerly Professor of Physics at the University of Oldenburg and the University of Hamburg, as well as Executive Director of the Institute for Solar Energy Research in Hannover, Germany, will receive the 2009 Gerischer Award of the ECS European Section. Previous awardees have included Akira Fujishima (Japan), Michael Grätzel (Switzerland), and Allen J. Bard (USA), all of them renowned for their accomplishments in the field of semiconductor electrochemistry and photoelectrochemistry.

Professor Memming has made outstanding contributions in many areas of solar energy research and electrochemistry of semiconductor materials, particularly in the fields of photoelectrochemistry, material science, spectroscopy, dye-sensitization, and charge transfer at semiconductor interfaces. He was among the first to study semiconductors sensitized with dyes, and his pioneering work utilizing ruthenium complexes as sensitizers has had an impact on the development of dye-sensitized solar cells. His research interests included both fundamental understanding of the materials and device physics of these cells, and their possible technology development. His studies concerned surface states, etching, impedance spectroscopy of semiconductor electrodes, as well as kinetics of electron transfer. He also contributed to the early design of systems for water splitting and hydrogen evolution. Professor Memming is recognized worldwide as a leading expert in many scientific disciplines but his most significant achievements are in the field of photoelectrochemistry.

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Technical Exhibit

The Technical Session coffee break is scheduled for 0930h on Level OE-Yellow 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, May 7 ..... 1800-2000h
includes the Monday Evening Poster Session

Tuesday, May 8..... 0900-1400h
re-opening..... 1900-2100h
includes the Tuesday evening Poster Session

Wednesday, May 9 ..... 0900-1400h

Exhibitors as of Press-Time

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ecs@electrochem.org
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EuroCVD 17

Schedule of Events

EuroCVD registration required, except where noted.

MONDAY, OCTOBER 5

1200h.....EuroCVD Luncheon, Lounge 3, Level 01-Green

1540h.....EuroCVD Coffee Break, Hall F1, Level OE-Yellow

1800h.....EuroCVD Poster Session, Hall F2, Level OE-Yellow (EuroCVD registration not required.)

TUESDAY, OCTOBER 6

1200h.....EuroCVD Luncheon, Lounge 3, Level 01-Green

1400h.....EuroCVD "Historical Vienna" Tour, Meet at ACV main entrance at 1345h

WEDNESDAY, OCTOBER 7

1200h.....EuroCVD Luncheon, Lounge 3, Level 01-Green

1540h.....EuroCVD Coffee Break, Hall F1, Level OE-Yellow

1800h.....EuroCVD Poster Session, Hall F2, Level OE-Yellow (EuroCVD registration not required.)

THURSDAY, OCTOBER 8

1200h.....EuroCVD Luncheon, Lounge 3, Level 01-Green

1540h.....EuroCVD Coffee Break, Hall F1, Level OE-Yellow

1800h.....EuroCVD Banquet, Lounge 3/4, Level 01-Green

SOFC XI

Schedule of Events

SOFC registration required, except where noted.

MONDAY, OCTOBER 5

0830h.....Coffee Break, Foyer B, Level 02-Red

1540h.....SOFC Coffee Break, Hall B, Level 02-Red

1800h.....SOFC Poster Session, Foyer B/C, Level 02-Red (SOFC XI registration not required.)

TUESDAY, OCTOBER 6

0930h.....Coffee Break, Foyer B/C, Level 02-Red

1540h.....SOFC Coffee Break, Hall B, Level 02-Red

1800h.....SOFC Poster Session, Foyer B/C, Level 02-Red (SOFC XI registration not required.)

WEDNESDAY, OCTOBER 7

0930h.....Coffee Break, Foyer B/C, Level 02-Red

1800h.....SOFC Banquet, Lounge 3/4, Level 01-Green

THURSDAY, OCTOBER 8

0930h.....Coffee Break, Foyer B/C, Level 02-Red

1540h.....SOFC Coffee Break, Hall B, Level 02-Red

1800h.....SOFC Poster Session, Foyer B/C, Level 02-Red (SOFC XI registration not required.)

FRIDAY, OCTOBER 9

0930h.....Coffee Break, Foyer B/C, Level 02-Red

1540h.....SOFC Coffee Break, Hall B, Level 02-Red

Luncheons, Business Meetings & Special Events

See sidebar (left) for EuroCVD 17 and SOFC XI Schedule of Events

All luncheon and special event tickets are nonrefundable and should be purchased in advance. Tickets are priced as follows.

Luncheons: $36 ($30 + $6 VAT) in advance, $42 ($35 + $7 VAT) onsite

Receptions: $16.80 ($14 + $2.80 VAT) in advance, $19.20 ($16 + $3.20 VAT) onsite
Other Events: price as noted

SUNDAY, OCTOBER 4

1900h ..... Electronics & Photonics Division Award Reception & General Meeting, Hall O, Level 01-Green (No ticket required.)

MONDAY, OCTOBER 5

1215h ..... Battery Division Luncheon & Business Meeting, Lounge 4, Level 01-Green

1215h ..... High Temperature Materials Division Luncheon & Business Meeting, Lounge 1, Level 01-Green

TUESDAY, OCTOBER 6

1215h ..... Corrosion Division Luncheon & Business Meeting, Lounge 5, Level 01-Green

1215h ..... Sensor Division Luncheon & Business Meeting, Lounge 6, Level 01-Green

1800h ..... Corrosion Division Award Reception, Lounge 5, Level 01-Green

1800h ..... ECS Olin Palladium Award Reception, Rondo, Level OE-Yellow (No ticket required.)

WEDNESDAY, OCTOBER 7

1215h ..... Electrodeposition Division Luncheon & Business Meeting, Lounge 1, Level 01-Green

1215h ..... Luminescence & Display Materials Division Luncheon & Business Meeting, Lounge 5, Level 01-Green

1830h ..... European Section Heinz Gerischer Award Reception, Lounge 6, Level 01-Green (No ticket required.)

1900h ..... Battery Division Award Reception, Lounge 2, Level 01-Green

1800h ..... SOFC Banquet, Lounge 3/4, Level 01-Green

THURSDAY, OCTOBER 8

1800h ..... EuroCVD Banquet, Lounge 3/4, Level 01-Green

Hotel & Travel Information

The 216th ECS Meeting, EuroCVD 17, and SOFC XI will be held at the Austria Center Vienna (ACV), located at IAKW, AG, Bruno-Kreisky-Platz 1, A-1220, Vienna, Austria. Several hotels are located within walking distance or a quick subway ride. Guest room reservations can be made online from the ECS website. The discounted meeting rates, deadlines, and terms vary by hotel and can be accessed from the ECS website.

Ground Transportation—To get from the Vienna Airport at Schwechat, located outside the city limits, to the city center, you can choose from the City Airport Train, an Airport Express bus, the Schnellbahn (City Train), the Vienna Airport Service, or a taxi. See the ECS website for further details.

Companion Registrant Program—Guests of Technical Registrants are invited to register for the 216th ECS Meeting as a "Companion Registrant." The companion registration fee of $60 in advance ($50 + $10 VAT) or $66 onsite ($55 + $11 VAT) includes admission to non-ticketed social events; an exclusive lounge (Lounge 7, Level 01-Green) with beverage service; Monday through Thursday, 0800-1000h; and a special "Welcome to Vienna" orientation presented by the Vienna Convention Bureau on Monday, October 5 at 0900h in the Companion Registrants Lounge. On Thursday, October 8 at 0900h, there will be a group discussion of the book *Mozart's Wife* by Juliet Waldron—the story of her passion for her husband and her struggle to survive being a married to a musical genius who gave little care to the money required to support a lifestyle of parties, hard drinking, and chasing after women and the fickle patronage of aristocrats, upon whom they depended. The book is available online at Amazon.com.

Technical Program

Technical Session Co-Chair Orientation—We encourage all Symposium Organizers and Technical Session Co-Chairs to attend this important informational session in Hall N, Level 01-Green on Sunday 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. We strongly suggest that presenting authors verify laptop/projector compatibility in the speaker-ready rooms at the meeting. Speakers requiring special equipment must make written request to ECS headquarters (meetings@electrochem.org) no later than three weeks before the meeting, and appropriate arrangements will be made at the expense of the author.

Poster Presentations and Sessions—Poster presentations must be in English, on a board approximately 35" high x 75" wide (90 cm high x 190 cm wide), corresponding to the abstract number and day of presentation in the final program. 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. Plan your display to fit on one upright panel approximately 35" high x 75" wide (90 cm high x 190 cm wide). Present displayed information from left to right, starting at the top left of the panel. The paper title, number, names, and affiliations of all authors MUST be at the top of the display. The recommended print size for the title is approximately 1" to 2" (2.5 cm to 5 cm) high. Authors should minimize written text but use it when necessary to emphasize essential data and/or to stimulate discussion. All illustrations, drawings, charts, pictures, graphs, figures, and written text should be large enough to allow easy reading from a distance of 5' (1.5 m). Matted and finished photographs are recommended to enhance visibility. Pushpins and/or thumbtacks will be supplied at the meeting. Commercial advertisements or publicity will NOT be permitted in poster presentations. Authors violating this regulation will be asked to remove their presentations immediately. Authors are responsible for setting up their displays, for being present during the entire scheduled poster session, and for removing their displays at the conclusion of the poster session. No posters will be displayed without author participation. NO EXCEPTIONS WILL BE GRANTED. Authors are responsible for the security of their displays and all items of value. ECS will not assume any responsibility for lost, stolen, or broken articles. Additional information or special requirements should be addressed to the individual symposium organizers prior to the meeting.

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 on Level 01-Green, at 1400h; judging of the posters will begin at 1700h. Participants are encouraged to attend the Technical Exhibit on Tuesday at 1200h where the winners will be announced and given an award plaque.

Speaker-Ready Room—Two Speaker-Ready Rooms will be available Sunday through Friday, in Rooms U542 & U544, Level OE-Yellow. These rooms are 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 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 ECS, nor can any endorsement be claimed.

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Special Symposium: "In Situ Diagnosis of Low Temperature Fuel Cells"

Friday, October 9, 0800-1200h, Hall H, Level U2-Blue

An optimized water management is one of the key factors for the performance and durability of low temperature fuel cells. A variety of methods are currently employed to evaluate and optimize materials for a fine-tuned water balance. *In situ* investigations gained an increasing importance within the last years and have led to great improvements of state-of-the-art fuel cell designs.

In this special symposium, recent achievements in the field of *in situ* technologies and results of related studies will be presented. Different diagnostic methods like neutron radiography, locally resolved current density measurements, high resolution synchrotron radiography, and electrochemical impedance spectroscopy (EIS) provide an informative basis and helpful insights in operating fuel cells. The focus of this symposium is a complimentary presentation of transport process in operating fuel cells and their effects on performance, aging, and material degradation. In addition to applied methods, new modeling approaches to describe the structure of porous media will be discussed which serve as basis for fundamental understanding of transport pathways in gas diffusion media. The list of contribution is completed by an insight to recent improvements in reconstruction algorithms as employed for three-dimensional imaging of tomographic applications.

The program is guided by activities of the network RuNPEM, funded by the German Federal Ministry of Education and Research (BMBF); the network unites the competencies of partners from universities and institutes in Germany working on different fields and areas from fundamental up to industrial research projects.

All meeting attendees are invited to participate in this symposium.

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 (HC)** editions of *ECS Transactions* will be available for purchase and pick-up at the meeting.

e **— Electronic (PDF)** editions of *ECS Transactions* issues will be available ONLY via the ECS Digital Library. Electronic editions of the The 216th ECS Meeting, EuroCVD 17 and SOFC-XI "at" meeting issues will be available for purchase beginning October 3, 2009. Please visit the ECS website for all issue pricing and ordering information for the electronic editions.

A — General Topics

A1 — General Student Poster Session — *V. Desai, G. Botte, V. R. Subramanian, and K. Sundaram*

A2 — Nanotechnology General Session — *C. Bock, J. Li, Z. F. Liu, and E. Traversa*

A3 — Michael Faraday: The First Nanotechnologist? An Invited Symposium — *R. Tweney, D. Misra, and K. Rajeshwar*

A4 — Tutorials in Nanotechnology: Focus on Physical and Analytical Electrochemistry, An Invited Symposium — *H. De Long, R. Mantz, S. Minteer, and P. Trulove*

B — Batteries, Fuel Cells, and Energy Conversion

B1 — Batteries and Energy Technology Joint General Session — *Z. Ogumi, A. Manivannan, and S. R. Narayanan*

B2 — Alkaline Electrochemistry in Fuel Cells — *D. Chu, R. Mantz, and C. Wang*

B4 — Intercalation Compounds for Lithium Batteries — *M. Whittingham, P. Bruce, C. M. Julien, M. Palacin, J. Prakash, and M. Thackeray*

B5 — Rechargeable Lithium Ion Batteries — *M. Winter, K. M. Abraham, D. Doughty, Z. Ogumi, and K. Zaghib*

B7 — Photovoltaics for the 21st Century 5 — *M. Tao, J. Brownson, P. Chang, C. Claeys, K. Kakimoto, K. Rajeshwar, M. Sunkara, and D. Yang*

B8 — PEM Fuel Cells 9 — *T. F. Fuller, P. Bele, S. Cleghorn, H. A. Gasteiger, C. Hartnig, T. Jarvi, D. J. Jones, C. Lamy, V. Ramani, P. Shirvanian, P. Strasser, H. Uchida, T. A. Zawodzinski, and P. Zelenay* HC e

B9 — Semiconductor Electrolyte Interface and Photoelectrochemistry — *K. Rajeshwar, M. A. Ryan, and T. A. Zawodzinski*

B10 — Solid Oxide Fuel Cells 11 (SOFC XI) — *S. Singhal and H. Yokokawa* HC e

C — Biomedical Applications and Organic Electrochemistry

C1 — Organic and Biological Electrochemistry General Poster Session — *J. Burgess*

C2 — New Biomimetic Materials for Electrochemical Sensing — *C. Kranz, M. Bayachou, and H. De Long*

C3 — Synthetic and Mechanistic Organic Electron Transfer Reactions — *T. Fuchigami, G. Cheek, D. Evans, and F. Maran*

D — Corrosion, Passivation, and Anodic Films

D1 — Corrosion General Session — *D. C. Hansen*

D2 — Coatings for Corrosion Protection — *G. Frankel, G. Grundmeier, H. N. McMurray, and T. Shinohra*

D3 — Corrosion of Electronic and Magnetic Materials — *L. Garfias, A. Gebert, and N. Missert*

D4 — High Temperature Corrosion and Materials Chemistry 8 — *E. Wuchina, J. W. Fergus, T. Markus, T. Maruyama, P. J. Masset, E. J. Opila, and D. Shifler*

D5 — Surface Treatment for Biomedical Applications 2 — *S. Djokic, Z. P. Aguilar, D. C. Hansen, and S. Virtanen*

D6 — Oxide Films — *P. Marcus, S. Fujimoto, and H. A. Terryn*

E — Dielectric and Semiconductor Materials, Devices, and Processing

E1 — Analytical Techniques for Semiconductor Materials and Process Characterization 6 — *B. Kolbesen, M. Bersani, C. Claeys, and L. Fabry* HC e

E2 — Atomic Layer Deposition Applications 5 — *S. De Gendt, S. F. Bent, A. Delabie, J. Elam, S. B. Kang, A. Londergan, and O. Van der Straten* HC e

E3 — Cleaning Technology in Semiconductor Device Manufacturing 11 — *J. Ruzyllo, P. Besson, T. Hattori, P. Mertens, and R. Novak* HC e

E4 — High Dielectric Constant Materials and Gate Stacks 7 — *S. Kar, M. Houssa, H. Iwai, D. Landheer, D. Misra, and S. Van Elshocht* HC e

E5 — Processing, Materials and Integration of Damascene and 3D Interconnects — *J. C. Flake, O. Leonte, G. S. Mathad, P. Ramm, H. S. Rathore, and F. Roozeboom*

E6 — One-Dimensional Nanoscale Electronic and Photonic Devices 3 — *L. Chou, G. Duesberg, S. Jin, J. Li, S. Roth, and Z. L. Wang* e

E7 — Organic Semiconductor Materials, Devices, and Processing 2 — *M. J. Deen, D. Gundlach, B. Iniguez, H. Klauk, and K. Worhoff*

E8 — Semiconductor and Plasmonics: Active Nanostructures for Photonic Devices and Systems — *M. Gerhold, S. Chen, D. Rogers, F. Teherani, and J. Xu* e

E9 — State-of-the-Art Program on Compound Semiconductors 51 (SOTAPOCS 51) — *E. Stokes, O. Ambacher, R. Goldhahn, J. Huang, G. Hunter, E. Kohn, C. O'Dwyer and M. E. Overberg* e

E10 — ULSI Process Integration 6 — *C. Claeys, S. Deleonibus, H. Iwai, J. Murota, and M. Tao* HC e

F — Electrochemical / Chemical Deposition and Etching

F1 — Current Trends in Electrodeposition, An Invited Symposium — *W. Schwarzacher*

F2 — Electrodeposition of Nanoengineered Materials and Devices 3 — *N. V. Myung, S. R. Brankovic, L. Deligianni, J. Mallet, E. J. Podlaha, J. F. Rohan, J. B. Talbot, N. J. Tao, and G. Zangari*

F3 — EuroCVD 17 and CVD 17 — *M. T. Swihart, R. A. Adomaitis, D. Barreca, and K. Worhoff* HC e

F4 — Fundamentals of Electrochemical Growth: From UPD to Microstructures, A Symposium in Memory of Prof. Evgeni Budevski — *S. R. Brankovic, P. Allongue, M. Innocenti, L. Peter, N. Vasiljevic, and G. Zangari*

F5 — Semiconductors, Metal Oxides, and Composites: Metallization and Electrodeposition of Thin Films and Nanostructures — *G. Oskam, J. Fransaer, I. Shao, and P. M. Vereecken*

H — Fullerenes, Nanotubes, and Carbon Nanostructures

H1 — Carbon Nanotubes and Nanostructures: From Fundamental Properties and Processes to Applications and Devices — *R. B. Weisman, S. De Gendt, M. Kappes, M. Meyyappan, and M. Prato*

H2 — Nanostructure and Function of Fullerenes — *N. Martin, D. Guldi, A. Hirsch, and J. F. Nierengarten*

I — Physical and Analytical Electrochemistry

I1 — Physical, Electroanalytical, and Bioanalytical Electrochemistry — *P. J. Kulesza, M. Fojta, A. Kuhn, S. Minteer, and Z. J. Stojek*

I2 — Electrochemistry: Symposium on Interfacial Electrochemistry in Honor of Brian E. Conway — *B. MacDougall, C. Bock, E. Gileadi, S. Gottesfeld, D. Harrington, J. Leddy, W. Lorenz, S. Morin, B. Scrosati, and S. Trasatti*

I3 — Physical and Analytical Electrochemistry in Ionic Liquids — *P. Trulove, H. De Long, and R. Mantz*

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

J1 — Sensors, Actuators, and Microsystems General Session — *R. Mukundan*

J2 — Impedance Techniques: Diagnostics and Sensing Applications — *V. Lvovich, C. C. Hansen, M. E. Orazem, B. Tribollet, and P. Vanysek*

J4 — Physics and Chemistry of Luminescence Materials, W. M. Yen Memorial Symposium — *U. Happek, J. Collins, D. J. Lockwood, and A. M. Srivastava* HC e

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***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 on Level OE-Yellow. Registration will open on Sunday and the technical sessions will be conducted Sunday through Friday.

Key Locations

Meeting Registration	Level OE-Yellow
Information/Message Center	Level OE-Yellow
ECS Headquarters Office	Suite E, Level OE-Yellow
ECS Book Store	Level OE-Yellow
Speaker Ready Rooms	Rooms U542 & U544, Level OE-Yellow
Employment Interview Room	Room U641, Level OE-Yellow

Book Store Hours

Sunday, October 4	0700-1900h
Monday, October 5	0700-1900h
Tuesday, October 6	0700-1730h
Wednesday, October 7	0800-1600h
Thursday, October 8	0800-1600h
Friday, October 9	0800-1200h

Registration Hours

Saturday, October 3	1600-1900h
Sunday, October 4	0700-1900h
Monday, October 5	0700-1900h
Tuesday, October 6	0700-1730h
Wednesday, October 7	0800-1600h
Thursday, October 8	0800-1600h
Friday, October 9	0800-1200h

***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, American Express, or Discover are also accepted. *All prices are in U.S. dollars.*

All technical registrations include a copy of the *Meeting Abstracts* on CD-ROM only. Attendees who wish to have paper copies of abstracts should download and print them in advance of the meeting, from the ECS website, free of charge. Please note that paper copies of meeting abstracts will NOT be available. Additional copies of the *Meeting Abstracts* on CD-ROM may be purchased by registrants; the cost is $74 for ECS Members and $92.50 for Nonmembers.

All students must send verification of student eligibility along with their registration. 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 ½" by 11". Room U546, Level OE-Yellow will be available as an Employment Interview Room from 0700-1900h Sunday through Friday for representatives from those companies or institutions that would like to interview applicants during the meeting.

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.

	Onsite		
	Fee	VAT	Total
ECS Member	$560	$112	$672
ECS Student Member	$290	$58	$348
ECS Member: One-Day	$425	$85	$510
Nonmember	$760	$152	$912
Nonmember Student	$320	$64	$384
Nonmember: One-Day	$505	$101	$606
Companion	$55	$11	$66
SOFC Package[1]			
SOFC Technical	$745	$149	$894
SOFC Student	$455	$91	$546
SOFC Banquet Only	$155	$31	$186
EuroCVD Package[2]			
EuroCVD Technical	$1,045	$209	$1,254
EuroCVD Student	$780	$156	$936
EuroCVD Tour & Banquet Only	$200	$40	$240

[1]Price includes ECS meeting registration, the Meeting Abstracts on CD-ROM, a hard copy (with CD-ROM) of the proceedings published in *ECS Transactions,* and the Wednesday evening SOFC banquet.
[2]Price includes ECS meeting registration, the Meeting Abstracts on CD-ROM, a hard copy (with CD-ROM) of the proceedings published in *ECS Transactions*, "Historical Vienna" tour, lunch Monday through Thursday, and the Thursday evening EuroCVD banquet.
The 20% Austrian VAT is recoverable to some, but not all attendees, via their affiliated institutions. To determine if you qualify, please contact TaxPort: http://www.taxport-usa.com/ecs/

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