

## Water and Sanitation Challenges To Be Focus of 4<sup>th</sup> Electrochemical Energy Summit

by Dan Fatton

ECS is partnering with the Bill & Melinda Gates Foundation's Water, Sanitation & Hygiene (WASH) initiative to host a multi-day workshop at the 2014 International Electrochemical Energy Summit (E2S) in Cancun, Mexico being held October 5-9, 2014. The workshop will culminate in the on-the-spot distribution of over \$200,000 in seed funding from ECS, addressing critical technology gaps in water, sanitation, and hygiene challenges being faced around the world.

ECS hopes to improve access to clean water and sanitation in developing countries by leveraging the brainpower of the many scientists in electrochemistry and solid state science and technology attending the 2014 ECS and SMEQ Joint International Meeting. (See page 21 for more information about this meeting.)

Priority topic areas will include interfaces, disinfection, energy generation, energy storage, chemical conversion, monitoring and measurement, and dewatering technologies, among others, including a "wild card" topic area to be decided by participants.

"ECS is excited to partner with the Bill & Melinda Gates

Foundation to help address the urgent water and sanitation challenges the world is facing," says ECS President Paul Kohl. "This partnership provides a unique opportunity for researchers to generate potential solutions and then almost immediately start testing them."

The workshop will kick off with remarks from current awardees of the Bill & Melinda Gates Foundation. Participants will be guided through facilitated brainstorming and working group sessions by Brandy Salmon of RTI International. Attendees will work in full group and breakout sessions to address complex scientific issues, gaps and needs. They will be encouraged create partnerships and surface new approaches to existing challenges within the WASH portfolio.

At least two grants will be distributed on the last day of the meeting from the more than \$200,000 available, each in the range of \$25,000-\$100,000. Participants are expected to develop potential partnerships and collaborative proposals, then make an oral presentation. An independent review committee will review the proposals and make award recommendations by Friday, October 10, 2014.

**DAN FATTON** is the Director of Development for ECS. He may be reached at [dan.fatton@electrochem.org](mailto:dan.fatton@electrochem.org). ■

## Scenes from IMLB 2014

**IMLB**  
2014

Sponsored by ECS, the 17<sup>th</sup> International Meeting on Lithium Batteries (IMLB 2014) was held at Villa Erba in Como, Italy from June 10 to 14. IMLB is the premier international conference on the state of lithium battery science and technology, as well as current and future applications in transportation, commercial, aerospace, biomedical, and other promising sectors. The meeting had an attendance of over 900 people, as well there were 40+ keynote speakers and more than 500 poster presentations.

The meeting focused on both basic and applied research findings that have led to improved Li battery materials, and to the understanding of the fundamental processes that determine and control electrochemical performance. A major (but not exclusive)

theme of the meeting were recent advances in beyond lithium-ion batteries. Bruno Scrosati, Chair of the 17<sup>th</sup> IMLB said, "I am grateful to the International Scientific Committee for helping to assemble another cadre of renowned speakers to present the latest research at our conference. I would also like to express my thanks to The Electrochemical Society and Centro Volta for their perfect organizing assistance, which allowed me to arrange another successful conference. We are already looking forward to the next IMLB in Chicago in 2016."

Special thanks to all the sponsors and technical exhibitors. There will be a volume of *ECS Transactions* with proceedings papers from the meeting, and an Open Access focus issue is planned for *The Journal of Electrochemistry* that will feature selected papers.

(Photos continued on next page)



YANG SHAO-HORN, a keynote speaker, presents "Recent Advances in Lithium-Oxygen Batteries."



YI CUI, a keynote speaker, presents "Nanomaterials Design for Next Generation of Energy Storage."



LINDA NAZAR, a keynote speaker, presents "Advancing the Lithium-Sulfur Battery."



KUNIAKI TATSUMI, a keynote speaker, presents "Enhanced Cyclability of  $\text{LiNi}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3}\text{O}_2$  Coated with Various Oxides under High Voltage Charge/Discharge Cycles."

## IMLB 2014

*(continued from previous page)*



**BRUNO SCROSATI**, IMLB 2014 Chair and founder of IMLB.



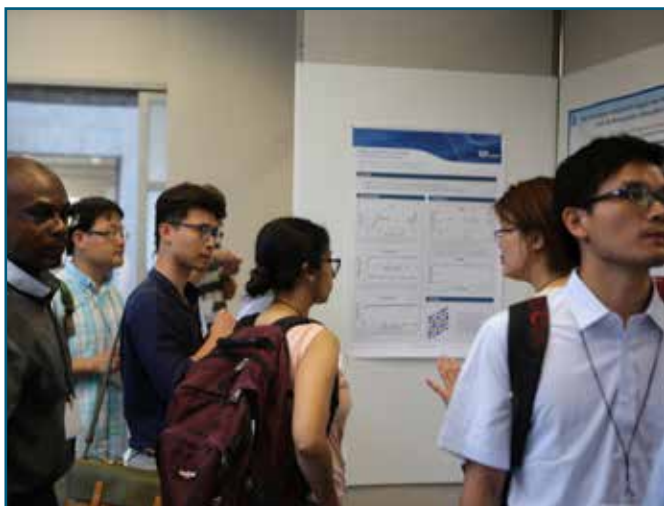
**KARIM ZAGHIB**, a past chair of IMLB (2010), with a meeting attendee.



**KHALIL AMINE**, a member of the IMLB 2014 International Organizing Committee, speaks at the gala dinner.



*Conference attendees in the main presentation hall.*



A poster presentation at IMLB 2014.



The view of the Italian countryside from the Grand Hotel di Como.



The Villa Erba Antica, site of the gala dinner.

## International Organizing Committee Chairs (in alphabetical order)

- Doron Aurbach, *Bar Ilan University, Tel Aviv, Israel*
- Peter Bruce, *University of St. Andrews, Scotland*
- Rosa Palacin, *ICMAB-CSIC Campus, Bellaterra, Spain*
- Bruno Scrosati, *Helmholtz Institute Ulm, Germany*
- Jean-Marie Tarascon, *Université de Picardie Jules Verne, France*
- Josh Thomas, *Uppsala University, Sweden*
- Margret Wohlfahrt-Mehrens, *Center for Solar Energy and Hydrogen Research Baden-Württemberg, ZSW, Ulm, Germany*

## International Scientific Committee (in alphabetical order)

- KM Abraham, *E-KEM Science, USA*
- Khalil Amine, *Argonne National Lab, USA*
- Yi Cui, *Stanford University, USA*
- Juergen Garche, *FCBAT, Ulm, Germany*
- Li Hong, *China*
- Youn-Jun Kim, *Korea Electronics Technology Institute (KETI), Korea*
- Marina Mastragostino, *University of Bologna, Italy*
- Aleksandar Matic, *Chalmers University of Technology, Sweden*
- Linda Nazar, *Waterloo University, Canada*
- Zempachi Ogumi, *University of Kyoto, Japan*
- Tetsuya Osaka, *Waseda University, Tokyo Japan*
- Stefano Passerini, *Muenster University, Germany*
- Yang Shao-Horn, *MIT, USA*
- Yang-Kook Sun, *Hanyang University, Seoul, Korea*
- Osamu Yamamoto, *Mie University, Japan*
- Yang Yong, *Xiamen University, China*
- Karim Zaghib, *Institut de recherche en électricité d'Hydro-Québec (IREQ), Quebec, Canada*

## CSTIC 2014

ECS and SEMI are pleased to announce that the annual China Semiconductor Technology International Conference (CSTIC 2014) successfully concluded on March 17, 2014 in Shanghai, China with over 340 speakers and more than 700 attendees from around the world. The successful conclusion of CSTIC 2014 marked another milestone of this annual international conference. With a focus on semiconductor technology and manufacturing, CSTIC promoted technical exchanges on the latest developments in semiconductor technology and manufacturing and facilitated investment and collaboration in the semiconductor industry in Asia, particularly China.

CSTIC 2014 covered all aspects of semiconductor technology and manufacturing, including circuit design, devices, lithography, integration, materials, processes, and manufacturing, as well as emerging semiconductor technologies and silicon material applications. Hot topics, such as 3D integration, LEDs, and MEMs, were also included in the conference. Tzu-Yin Chiu (CEO and Executive Director, SMIC), Tak H. Ning (IBM Fellow and Member of U.S. National Academy of Engineering, IBM T.J. Watson Research Center), and Kevin Zhang (Intel Fellow and Vice President in the Technology and Manufacturing Group, Intel Corporation) delivered the keynote speeches at the conference. Over 150 other leading experts in semiconductor technology presented keynote and invited talks in the symposia.

CSTIC 2014 was organized by SEMI and ECS, co-organized by China's High-Tech Expert Committee (CHTEC), and co-sponsored by IEEE-EDS, MRS and the China Electronics Materials Industry Association. Several industry companies provided financial support for this industrial semiconductor technology conference. Additional sponsors included: JCET Chaingjiang Electronics Technology Co. Ltd., Henkel, SMIC (Semiconductor Manufacturing International Corporation), Tokyo Electron Limited, Applied Materials Inc., ANJI, ASE Group, Inc., ADVANTEST, NMC North Microelectronics Co. Ltd., ASM, Edwards, ULVAC, and Finnegan.

More than 200 CSTIC 2014 papers were published in *ECS Transactions* in highlights from CSTIC 2014 technologies. Cor Claeys was the conference chair this year. Prof. Claeys is a Senior Member of IEEE and a Fellow of The Electrochemical Society. Paul Kohl, ECS President, gave an opening welcome and introduction to ECS at the plenary session.

The ECS Best Student Paper Award winners were Meng Lin (Institute of Microelectronics, Peking University, Beijing, China) and Wen Lv (Huazong University of Science and Technology, Wuhan, China). CSTIC 2015 is scheduled to be held March 15-16, 2015 in Shanghai, China. More information about CSTIC is available at [www.semiconchina.org/cstic](http://www.semiconchina.org/cstic).



This group photo taken at CSTIC 2014 includes (from left to right): **QINGHUANG LIN** (CSTIC Co-chair), **DAVID HUANG** (CSTIC Co-chair), **SHIUH-WUU LEE** (SMIC EVP, Keynote speaker), **TAK NING** (IBM Fellow, Keynote speaker), **KEVIN ZHANG** (Intel fellow and VP, Keynote speaker), **COR CLAEYS** (CSTIC Chair), **ALLEN LU** (SEMI China President), **ROQUE CALVO** (ECS Executive Director), and **PAUL KOHL** (ECS President).

## Division News



The **BATTERY DIVISION** recently modified its bylaws and the modifications were approved by the ECS Board of Directors. This revision allows the Division Executive Committee to increase the number of members-at-large to at least eight persons. In addition to the officers, there will be an increased number of candidates in the upcoming ballot for the election. The present officers encourage our Division members to vote and become actively involved in our division affairs in the future.

The Battery Division Executive Committee is seeking sustainable funding mechanisms to provide adequate support for travel grants to help student members and early-career professionals to participate in our society meetings and symposia. We welcome and solicit inputs and innovative ideas to help us succeed in this pursuit. Please send your suggestions to Bor Yann Liaw at bliaw@hawaii.edu.



The **PHYSICAL & ANALYTICAL ELECTROCHEMISTRY DIVISION (PAED)** held their annual lunch and business meeting during 225<sup>th</sup> ECS Meeting in Orlando. At the meeting, chair, Rob Mantz, talked about the state of the Division. In addition, the secretary and treasurer gave their reports.

It was reported that the PAED division awarded six travel grants to the 224<sup>th</sup> ECS Fall Meeting in San Francisco. The travel grant winners were: Megan Damm (Georgia Institute of Technology), Samar Gharaibeh (University of Calgary), Swetha Puchakayala (Vellore Institute of Technology), Adriel Jebaraj (Case Western Reserve University), Akinbayowa Falase (The University of New Mexico), and Florina-Maria Cuius (Technische Universität Ilmenau). There were seven student travel grant award winners for the 225<sup>th</sup> ECS Spring meeting in Orlando. The award winners were: Meng Li (Brookhaven National Laboratory), Sergio Garcia (CEET, The University of New Mexico), Congling Zhang (The University of Tennessee), Edgard Ngaboyamahina (UPMC), Adriel Jebaraj (Case Western Reserve University), Matteo Grattieri (Politecnico of Milan), and Rachel Hjelm (The University of New Mexico). Congratulations to all of the award winners from both biannual meetings. The next PAED luncheon and business meeting will be held during the 227<sup>th</sup> ECS Spring Meeting in Chicago, Illinois in May of 2015.

The Physical & Analytical Electrochemistry Division sponsors two awards, the David C. Grahame Award and the Max Bredig Award, in Molten Salt Chemistry. Dr. Mantz encouraged members to submit nominations for both awards. ■

# INTERFACE

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## Division Officer Slates Announced

New officers for the 2014-2016 term have been nominated for the following Divisions. All election results will be reported in the winter 2014 issue of *Interface*.



### Battery Division

*Chair*

Robert Kostecki, Lawrence Berkeley National Laboratory

*Vice-Chair*

Christopher Johnson, Argonne National Laboratory

*Secretary*

Marca Doeff, Lawrence Berkeley National Laboratory

*Treasurer*

Shirley Meng, University of California, San Diego

*Members-at-Large (at least 8 members-at-large to be elected)*

Richard Jow, Army Research Laboratory  
 Dominique Guyomard, CNRS - Université de Nantes  
 Brett Lucht, University of Rhode Island  
 Marina Yakovleva, FMC Corporation  
 Khalil Amine, Argonne National Laboratory  
 John Muldoon, Toyota Research Institute  
 of North America  
 Martin Winter, MEET Battery Research Center,  
 University of Muenster  
 Yi Cui, Stanford University  
 Kristina Edstrom, Uppsala University



### Corrosion Division

*Chair*

Rudy Bucheit, Ohio State University

*Vice-Chair*

Sanna Virtanen, University of Erlangen-Nuremberg

*Secretary/ Treasurer*

Masayuki Itagaki, Tokyo University of Science

*Members-at-Large (at least 6 members-at-large to be elected)*

Nancy Missert, Sandia National Laboratories  
 H. Neil McMurray, University of Wales  
 Jamie Noel, Western University  
 Dev Chidambaram, University of Nevada, Reno  
 Nick Birbilis, Monash University  
 Philippe Marcus, CNRS-ENSCP



### Sensor Division

*Chair*

Bryan Chin, Auburn University

*Vice-Chair*

Nianqiang (Nick) Wu, West Virginia University

*Secretary*

Ajit Khosla, Mobecomm Inc.

*Treasurer*

Sushanta Mitra, University of Alberta  
 Praveen Sekhar, Washington State University  
 Jessica Keohne, NASA Ames Research Center

*Members-at-Large (at least 2 members-at-large to be elected)*

Sheikh Akbar, Ohio State University  
 Zoraida Aguilar, Zystein, LLC  
 Cynthia Bruckner-Lea, Pacific Northwest Laboratories  
 Ying-Lan Chang, Glo AB  
 Jay Grate, Pacific Northwest Laboratories  
 Peter Hesketh, Georgia Tech  
 A. Robert Hillman, University of Leicester  
 Gary Hunter, NASA Glenn Research Center  
 Tatsumi Ishihara, Kyushu University  
 Sang Ming Jeon, Postech  
 Mira Josowicz, Georgia Tech  
 Kale Girish, University of Leeds  
 P. J. Kulesza, University of Warsaw  
 Christine Kranz, University of Ulm  
 Jing Li, NASA Ames Research Ctr.  
 Chung-Chiun Liu, Case Western Reserve University  
 Vadim Lvovich, NASA Glenn Research Center  
 Norio Miura, Kyushu University  
 Rangachary Mukundan, Los Alamos  
 National Laboratory  
 Larry Nagahara, National Cancer Institute  
 Antonio Ricco, Stanford University  
 Christopher Salthouse, University  
 of Massachusetts Amherst  
 Michael Sailor, University of California - San Diego  
 Praveen Kumar Sekhar, Washington State University  
 Yasuhiro Shimizu, Nagasaki University  
 Aleksandr Simonian, Auburn University  
 Joseph Stetter, KWJ Engineering Incorporated  
 Thomas Thundat, University of Alberta  
 Petr Vanýsek, Northern Illinois University  
 Raluca Van Staden, Bucharest Romania National  
 Institute of Research for Electrochemistry  
 and Condensed Matter  
 Laju Yang, North Carolina Central University

## Institutional Member News

### Spotlight on EL-CELL



One of the newest members of the ECS institutional membership program is the German company, EL-CELL. EL-CELL offers electrochemical test equipment and services to perform high quality battery research at the forefront of actual knowledge. The company engineers and manufactures its products for both researchers in academia and professionals in industry. The main emphasis is on lithium-ion batteries, but EL-CELL also designs test cells for other energy storage technologies. Its product portfolio varies from batteries with aprotic or aqueous electrolytes to capacitor systems to perform two- and three-electrode tests, gas and pressure experiments, optical measurements and investigation of height changes of electrodes. In addition, EL-CELL offers special tools for a more productive experimentation process and a wide scope of services, such as seminars or test measurements.

Johannes Hinckeldeyn, Director of Sales and Marketing at EL-CELL, explains the strong collaboration with ECS, "EL-CELL wants to become the standard toolbox for all battery researchers. ECS is the global organization of Electrochemists and therefore our main partner to support electrochemists who want to achieve better research results. Beside our equipment, we offer special seminars for beginners and experienced researchers to learn how to conduct successful battery tests with our equipment. ECS members are cordially invited to participate and they will get special conditions for our seminars."

Dan Fatton, ECS Director of Development, noted, "ECS is excited about the strong partnership we have been developing with EL-CELL. We appreciate their institutional membership support, and their participation as an advertiser and regular exhibitor at ECS meetings."

Additionally, ECS members are now eligible for a special discounted rate on EL-CELL's seminar programs. The first, a hands-on seminar on basic battery research will be offered November 6-7, 2014 at the EL-CELL facility in Hamburg, Germany. The second, a hands-on seminar on advanced battery research will be offered March 12-13, 2015, also in Hamburg, Germany. Please visit [www.el-cell.com/service](http://www.el-cell.com/service) for registration and further information. ■

## ECS Staff News



Logan Elizabeth Streu joined the ECS staff as a Publications Assistant in May 2014 reporting to Annie Goedkoop, ECS Director of Publications. Logan is responsible for assisting in the production of *ECS Transactions*, as well as the ECS journals. She graduated this May from The College of New Jersey with a Bachelor of Arts in English and a minor in Creative Writing. Prior to her full-time employment at The Electrochemical Society, Logan served as a

publications intern starting in May 2013, and was later hired as a part-time Publications Assistant in September of the same year.

Although this is her first full-time position in the publishing field, Logan worked for two years as a Student Assistant in the Office of Major and Strategic Events at The College of New Jersey where she aided in planning and coordinating high-profile campus events such as Homecoming, Reunion and Commencement. In the fall of her senior year, Logan was involved in TCNJ's Visiting Writers Series, an on-campus arts community which nominates and arranges for notable authors to give readings at the college. During this time Logan worked on press kits and other promotional materials for authors Paul Legault and Adam Levin, and later helped to nominate Ishmael Reed and Matthea Harvey for future readings.

"We were impressed with Logan's enthusiasm and skills as an intern," said Annie Goedkoop, "so much so that we didn't want to let her go when the internship ended. She is a welcome addition to the ECS staff." ■



**ECS celebrates the many successful achievements of members of the electrochemical and solid state science community.**

*We thank you* for your dedication to scientific research and discovery, for the innovations you continually develop that are fueling an energy revolution, and, above all, for your commitment to helping to make the world a better place for generations to come.

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## ECS Sponsored Meetings for 2014

*In addition to the regular ECS biannual meetings and ECS Satellite Conferences, ECS, its Divisions, and Sections sponsor meetings and symposia of interest to the technical audience ECS serves. The following is a list of the sponsored meetings for 2014. Please visit the ECS website for a list of all sponsored meetings.*

- **10<sup>th</sup> International Symposium on Electrochemical Micro & Nanosystem Technologies**, November 5-8, 2014 — Okinawa, Japan
- **Fifth International Conference on Electrophoretic Deposition: Fundamentals and Applications (EPD-2014)**, October 5-10, 2014 — Hernstein, Austria
- **XIV International Congress of the Mexican Hydrogen Society**, September 30-October 4, 2014 — Cancun, Mexico
- **65<sup>th</sup> Annual Meeting of the International Society of Electrochemistry**, August 31-September 5, 2014 — Lausanne, Switzerland

*To learn more about what ECS sponsorship could do for your meeting, including information on publishing proceeding volumes for sponsored meetings, or to request an ECS sponsorship of your technical event, please contact [ecs@electrochem.org](mailto:ecs@electrochem.org).*

## In the **NEXT** issue of **INTERFACE**

- The winter issue of Interface will feature the **CORROSION DIVISION** and will emphasize the theme, “Numerical Modeling for Corrosion.” The issue will be guest edited by **Shinji Fujimoto**, Osaka University, and will feature the following articles (tentative titles): “Numerical Models for Localized Corrosion,” by **Robert Kelly**, University of Virginia; “Numerical Models for Macro Scale Corrosion and Protection,” by **Kenji Amaya**, Tokyo Institute of Technology; “Atomistic Models for Corrosion,” by **Christopher Taylor**, DNV GL; and “Probabilistic Models for Corrosion,” by **Nicholas Laycock**, QSGTL, and **David Williams**, University of Auckland.
- Highlights from the **2014 ECS and SMEQ Joint International Meeting in Cancun** will be presented.
- **TECH HIGHLIGHTS** continues to provide readers with free access to some of the most interesting papers published in the ECS journals, including articles from the Society’s newest journals: *ECS Journal of Solid State Science and Technology*, *ECS Electrochemistry Letters*, and *ECS Solid State Letters*.
- Don’t miss the next edition of **WEBSITES OF NOTE** which gives readers a look at some little-known, but very useful sites.



## websites of note

by Zoltan Nagy

### Lecture Notes in Electrochemistry/Electrochemical Engineering

Detailed course material from MIT, including: equivalent circuit models, thermodynamics, reaction kinetics, transport phenomena, electrostatics, electrokinetics, porous media, and phase transformations.

- M. Bazant, MIT
- <http://ocw.mit.edu/courses/chemical-engineering/10-626-electrochemical-energy-systems-spring-2011/lecture-notes/>

### Electroforming — a Unique Metal Fabrication Process

Electroforming plays an important role in our daily lives. We have contact with its results many times each day and it greatly enhances our lifestyle in a variety of ways. In addition, it is an extremely versatile process. For instance, it is used to produce micro components for the medical and electronics industries and huge components for the aircraft and aerospace industries. For many applications it has become indispensable.

- R Parkinson, Nickel Development Institute
- [http://www.nickelinstitute.org/~Media/Files/TechnicalLiterature/Electroforming\\_AUniqueMetalFabricationProcess\\_10084\\_.pdf](http://www.nickelinstitute.org/~Media/Files/TechnicalLiterature/Electroforming_AUniqueMetalFabricationProcess_10084_.pdf)

### Electrochemical Machining of Metal Plates

Technical basis of electrochemical machining. Experimental basis of electrochemical machining. Theoretical basis of current distribution. Experimental tests and results (stationary cathode, advancing cathode, rotating cathode). Interpretations of results. Implementation of the process.

- J. F. Cooper and M. C. Evans, Lawrence Livermore National Laboratory
- <http://www.llnl.gov/tid/lof/documents/pdf/317378.pdf>

### Electropolishing of Stainless Steels

Electropolishing is a chemical surface finishing technique, by which metal is electrolytically removed, ion by ion, from the surface of a metal object. The primary objective is to minimize microroughness, thus dramatically reducing the risk of dirt or product residues adhering and improving the cleanability of surfaces. Electropolishing is also used for deburring, brightening, and passivating. The process exposes an undisturbed, metallurgically clean surface, eliminating thermal stress and surface roughening, and improving the corrosion resistance.

- Kosmač, Euro Inox
- [http://www.euro-inox.org/pdf/map/Electropolishing\\_EN.pdf](http://www.euro-inox.org/pdf/map/Electropolishing_EN.pdf)

### About the Author

**ZOLTAN NAGY** is a semi-retired electrochemist. After 15 years in a variety of electrochemical industrial research, he spent 30 years at Argonne National Laboratory carrying out research on electrode kinetics and surface electrochemistry. Presently he is at the Chemistry Department of the University of North Carolina at Chapel Hill. He welcomes suggestions for entries; send them to [nagyze@email.unc.edu](mailto:nagyze@email.unc.edu).