

SEAC *communications*

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PRESIDENT'S MESSAGE

Gentlefolks:

The plans for PittCon 2013 are now in place. The meeting will be held 17 to 21 March 2013 at the Pennsylvania Convention Center in Philadelphia. The 2013 Charles N. Reilley Award winner is Andy Ewing, Chalmers Univ. and the University of Gothenburg, and the 2013 Young Investigator is Bo Zhang, Univ. of Washington. **The Reilley Award Symposium**, organized by Henry White, is Monday, March 18, 2013 at 2:00 PM, Room 114. We thank BASi for their continued and generous support of the Reilley Award. On Tuesday morning, an invited symposium, **SEAC – Pivotal Ideas in Electroanalysis** is held in Room **118A**. Dave Cliffler and Steve Maldonado have organized **SEAC - Highlighting Young Investigators** that highlights new investigators in electrochemistry and electroanalysis. This symposium is Tuesday afternoon in Room 118A. The **SEAC Posters: Electroanalysis** session, a venue where student contributions are especially sought, is Wednesday morning in Room 204ABC. Also of interest to SEAC members is the Ralph N. Adams Award, presented to J. Michael Ramsey, University of North Carolina, on Wednesday afternoon in Room 126A. All are invited to the **SEAC Reception** after the Reilley Award Symposium on Monday and our briefest possible annual business meeting. Please join us for dinner to honor the SEAC awardees, which will be held after the reception. More information about locations and times for the reception and dinner will be made available closer to the meeting.

Reilley Award Symposium	Monday Afternoon
Reilley Reception and Dinner	Monday Evening
SEAC – Pivotal Ideas in Electroanalysis	Tuesday Morning
SEAC - Highlighting Young Investigators	Tuesday Afternoon
SEAC Posters: Electroanalysis	Wednesday Morning

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How Easy it is to Become a SEAC Member

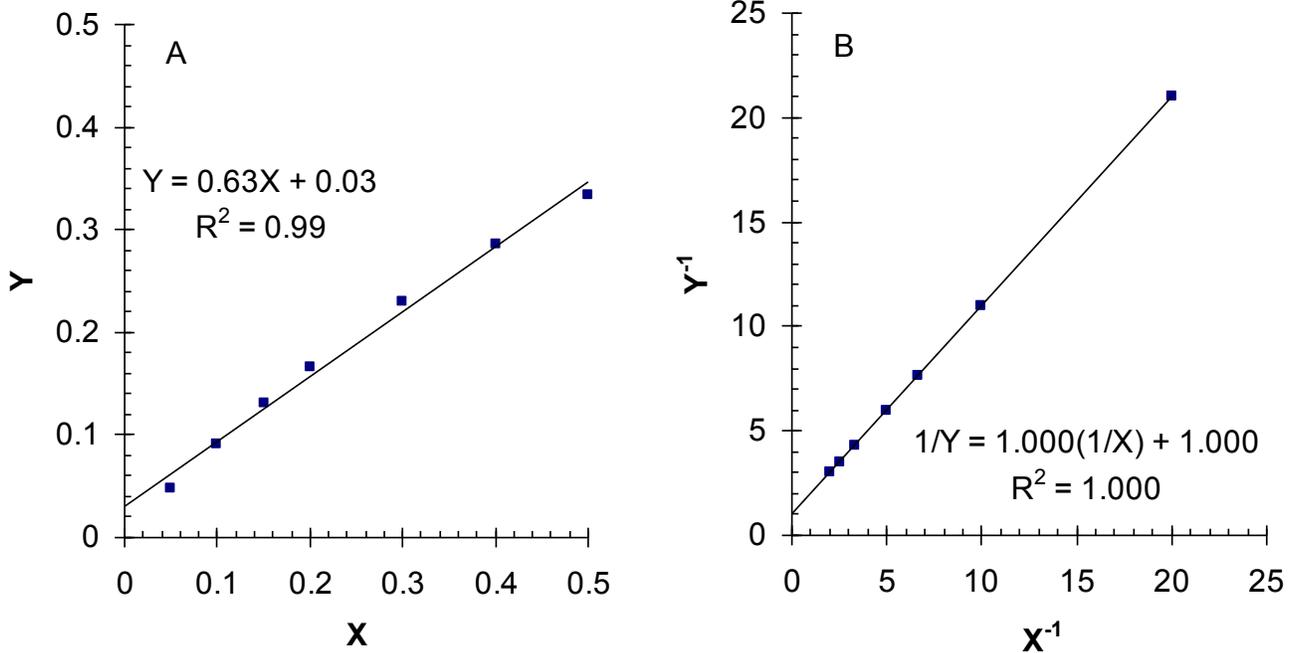
The Board of Directors is pursuing greater financial support for SEAC and its mission to promote electroanalytical chemistry. More information will be made available in the coming months. If you have any suggestions or comments, please tell a member of the Board. I would like to thank the members of the BOD for their efforts, creativity, and enthusiasm.

And now for some comments in the vein of analysis – both mathematical and chemical. Often immediate access to fitting programs denies the researchers appreciation of their system behavior.

Consider the “data” in Figure A. We have all seen plots like Figure A where the experimentalist is expecting a linear relationship between Y and X and so drops a regression line on the data. A correlation of $r^2 = 0.99$ is not terrible; the associated regression line is $Y = (0.63 \pm 0.03) X + (0.030 \pm 0.008)$.

But on closer inspection, these “data” are the source of additional information. The curve is slightly bowed. If more data were available at higher X, the rollover would be more apparent.

Figure A is consistent with the measured Y dependent on X and a second effect that is not X-dependent. The double reciprocal plot is often the means to better linearize such data and separate out X-dependent and X-independent effects. Separation of the dependencies can yield a better regression analysis. Double reciprocal plots are common in biochemical analysis. For the “data” in Figure A, the double reciprocal plot is shown in Figure B.



In Figure B, excellent linearity is demonstrated. (Actually, perfect linearity, but I made up the “data”.) The double reciprocal plot cleanly separates out the X-independent information (b, the intercept) and X-dependent information (the slope). Now the experimentalist knows there are two effects that establish Y and only one is X-dependent. Better system design may eliminate the X-independent component. A better regression can be achieved by correction of the Y values for the X-independent component b. One example is a plot of $Y/(1-bY)$ versus X.

Sometimes, there is information encrypted in the data. A double reciprocal plot with a better correlation coefficient than the corresponding Y versus X plot is a first clue. Now, when Y versus X is trailing downward and log-linear and log-log are not quite correct, consider Y versus X^{-1} ...

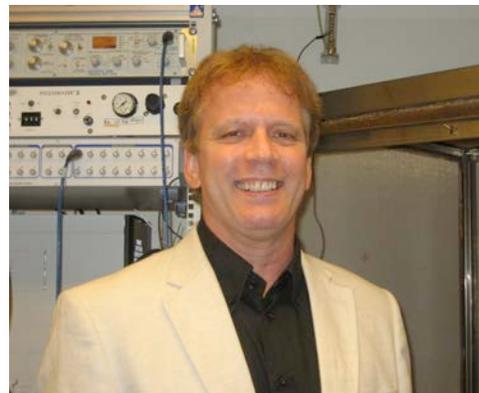
Johna Leddy

SEAC AWARDS

The *Charles N. Reilley Award in Electroanalytical Chemistry* is given in memory of one of the most distinguished analytical chemists of the 20th century. The 2013 award goes to Andrew Ewing, Chalmers University of Technology and the University of Gothenburg. The 2013 *Young Investigator Award* goes to Bo Zhang, Department of Chemistry, University of Washington. Both awards will be presented at Pittcon 2013.

Charles N. Reilley Award to Andrew Ewing

Andrew Ewing is Professor of Analytical Chemistry at both Chalmers University of Technology and the University of Gothenburg, and heads the Bioanalytical Initiative across both universities. Ewing received his BS degree from St. Lawrence University and a PhD from Indiana University working with R. Mark Wightman. After a postdoc at the University of North Carolina with Royce Murray, he joined the faculty at Penn State University where he worked for 25 years, finally as J. Lloyd Huck Chair. He has worked with some remarkable students and postdocs over the years and this group has pioneered small and sensitive chemical methods to measure neurotransmitters in the brain of a live fruit fly, *Drosophila melanogaster*, small-volume chemical measurements at single cells, electrochemical detection for capillary electrophoresis, novel approaches for electrochemical imaging of single cells, and new electrochemical strategies to separate individual nanometer vesicles from cells and quantify their contents. The long-term goals of his work are to gain fundamental understanding of the chemistry and function of biological cells, specifically nerve cells, by development of new methods in analytical chemistry.



Ewing sits on the advisory boards of several journals and is an Associate Editor of *Analytical Chemistry*. With his group he has published over 260 papers and reviews, and they are highly cited. Among other honors, he has been awarded the ACS Analytical Award in Chemical Instrumentation, the Eastern Analytical Symposium Award for Outstanding Achievements in the Fields of Analytical Chemistry, and has been elected as a Fellow in the AAAS. At Penn State he was perhaps most proud of winning the Graduate Faculty Teaching Award after being nominated by his students. He moved to Sweden in 2007 where he has since been named a Fellow of the Royal Society of Chemistry, and was named as an ERC Advanced grantee and a Wallenberg Scholar, Knut and Alice Wallenberg Foundation. In 2012, he was elected as a Swedish Member of the Swedish Royal Academy of Sciences (Chemistry Division).

SEAC Young Investigator Award to Bo Zhang

Bo Zhang graduated with a BS from Shandong University in 1999 and an MS degree from Peking University in 2002. He went on to work with Professor Henry White at the University of Utah and was awarded a Ph. D in 2006. He helped to develop glass nanopore electrodes during his graduate studies. He joined Professor Andrew Ewing's lab at Penn State as a postdoctoral associate where he learned single-cell amperometry and neurochemistry using very small electrodes. Bo started his independent research at the University of Washington in 2008. His current research at UW focuses on developing and using new nanoelectrodes for two different research topics: electrocatalysis of single metallic nanoparticles and nanoscale electrochemical imaging of neuronal communication. His group



has reported molecular-scale metal electrodes and their application in studying electrocatalytic properties of single metallic nanoparticles. Additionally, his group has recently invented a new analytical method to use fluorescence to report electrochemical kinetics on numerous very small electrodes. In addition, his lab is also interested in new applications of solid-state nanopores. He was awarded an Alfred Sloan Fellowship in 2012.

NEW NEWSLETTER STUDENT EDITOR

We welcome the second student editor of this newsletter, Trish Hredzak-Showalter, whose contributions you will find in upcoming newsletters. Note that **SEAC continues to seek nominations for additional student editors** to join the newsletter editorial board. The intention is to assure that graduate students' points of view and interests are appropriately represented in the newsletter. The primary job of a student editor is to contribute at least once or twice a year to the SEAC newsletter with a news item, preferably items of special interest to students and postdocs. So don't be afraid; the job is not too onerous.

Student editors are invited to join the annual SEAC board meeting, and during their tenure as graduate student editor their SEAC membership fee is waived. Send nominations or self-nominations to SEAC Communications editor Phil Buhlmann (buhlmann@umn.edu).

The newest addition to our team of student editors, **Trish Hredzak-Showalter** (hredzak@gmail.com), received her bachelors degree in chemistry from Chatham College in Pittsburgh, PA. She continued on to pursue her masters in chemistry from Tufts University near Boston, MA, where she focused her research on ion selective electrodes. She also worked briefly while at Tufts on NASA's Phoenix Mars Lander program, which measured the pH of the Martian surface for the first time. Wanting to apply her electroanalytical background to understanding terrestrial biogeochemical processes, she entered the graduate program in oceanography at The University of Delaware in September of 2010. Using solid-state Au-amalgam voltammetric microelectrodes that she constructs, she is able to simultaneously detect key redox active compounds (e.g., O_2 , H_2S , Mn^{2+} , Fe^{2+}). Recently she has coupled solid-state voltammetry with optical microscopy to allow for the acquisition of high resolution images to accompany the detection of redox compounds and gradients. This enhanced optical resolution of 0.55 μm will help to improve our understanding of how the geochemistry of these microenvironments is affected by specific microbial processes, which may be applicable on a much larger scale.



MEETINGS TO COME

Meetings of interest to our SEAC members abound during the coming year, with symposia being organized by some among us.

Meeting	When	Where	Link for More Information
Electrocatalysis and Interfacial Electrochemistry for Energy Conversion and Storage (Symposium C of the 2012 MRS Fall Meeting)	2012, November 25–30	Boston, MA, USA	http://www.mrs.org/f12-cfp-c/
Workshop on Electrochemistry	2013, Feb 9–10	Austin, TX, USA	http://cec.cm.utexas.edu/annual-electrochemistry-workshop
7th Workshop on Scanning Electrochemical Microscopy and Related Techniques	2013, Feb 17–21	Ein Gedi, Israel	http://chem.ch.huji.ac.il/SECM-2013/index.html
Electrochemistry (ZINC)	2013, Feb 25–28	Canary Islands, Spain	http://www.zingconferences.com
12 th ISE Spring Meeting	2013, March 17–21	Bochum, Germany	http://www.ise-online.org/annmeet/next_meetings.php
Pittcon 2013	2013, March 17–22	Philadelphia, PA, USA	http://www.pittcon.org/
XIX Brazilian Symposium of Electrochemistry and Electroanalytical	2013, April 1–5	Campos do Jordao, Brazil	http://eventos.ufabc.edu.br/xixsibee/
American Chemical Society Spring Meeting	2013, April 7–11	New Orleans, LA, USA	http://portal.acs.org/
13 th ISE Spring Meeting	2013, April 8–11	Pretoria, South Africa	http://www.ise-online.org/annmeet/next_meetings.php
223rd ECS Meeting	2013, May 12–17	Toronto, Ontario, Canada	http://www.electrochem.org/meetings/biannual/fut_mtgs.htm
ElecNano 5, The nano-scale and electroanalysis: surface nanostructuration, nanobiological systems, coupled methods, micro-systems	2013, May 15–17	Bordeaux, France	http://www.elecnano.fr
9th International Symposium on Electrochemical Impedance Spectroscopy	2013, June 16–21	Okinawa, Japan	http://www.rs.tus.ac.jp/eis2013/index.html
Faraday Discussion 2013 - Electroanalysis at the Nanoscale	2013, July 1–3	Durham, UK	(Contact: Richard Compton)
American Chemical Society Fall Meeting	2013, Sept. 8–12	Indianapolis, IN, USA	http://portal.acs.org/
64 th Annual ISE Meeting	2013, September 8–13	Santiago de Querétaro, Mexico	http://annual64.ise-online.org/
224th ECS Fall meeting	2013, Oct. 27–Nov. 1	San Francisco, CA, USA	http://www.electrochem.org/meetings/biannual/fut_mtgs.htm
Pittcon 2014	2014, March 2–6	Chicago, IL, USA	http://www.pittcon.org/
American Chemical Society Spring Meeting	2014, March 16–20	Texas TX, USA	http://portal.acs.org/

Meeting	When	Where	Link for More Information
14 th ISE Topical Meeting	2014, March 28–31	Nanjing, China	http://www.ise-online.org/annmeet/next_meetings.php
15 th ISE Topical Meeting	2014, April 27–30	Niagara Falls, Canada	http://www.ise-online.org/annmeet/next_meetings.php
225th ECS Spring meeting	2014, May. 11–16	Orlando FL, USA	http://www.electrochem.org/meetings/biannual/fut_mtgs.htm
American Chemical Society Fall Meeting	2014, Aug. 10–14	San Francisco CA, USA	http://portal.acs.org/
65 th Annual ISE Meeting	2014, August 31–September 5	Lausanne, Switzerland	http://www.ise-online.org/annmeet/next_meetings.php
226th ECS Fall meeting	2014, October 5–11	Cancun, Mexico	http://www.electrochem.org/meetings/biannual/fut_mtgs.htm
Pittcon 2015	2015, March 8–14	New Orleans, LA, USA	http://www.pittcon.org/
66 th Annual ISE Meeting	2015, October 4–9	Taipeh, Taiwan	http://www.ise-online.org/annmeet/next_meetings.php

Royce W. Murray Plenary Lecture and Honorary Symposium on November 15 at SERMACS 2012 in Raleigh, NC



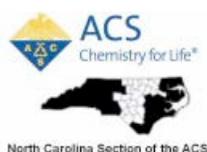
Royce W. Murray will be presenting a Plenary Lecture on **“Nanoparticle science and its analytical chemistry”** at 5 pm on November 15 at SERMACS 2012, being held Nov. 14-17 at the Raleigh Convention Center in Raleigh, NC.

A **Symposium in Honor of Royce W. Murray** will be held during the day preceding his Plenary Lecture. Co-organized by R. Mark Wightman and Lloyd P. Horne, the symposium will be comprised of both a morning and an afternoon session, as described below:

Morning session speakers: Alessa Gambardella, Joe Roberts, Radha Pyati, Gangli Wang, Jeffrey Long, Amala Dass, Michael Heien, Leslie Sombers, and Joe Tracy.

Afternoon session speakers: Frank Zamborini, David Cliffel, Robin McCarley, and Stephen Creager.

For more information, see <http://www.sermacs.2012.org>.



SERMACS 2012
Catalyzing Sustainable Innovation
 14-17 November 2012
 Raleigh Convention Center, Raleigh, North Carolina



Symposium sponsored by:



REPORT FROM SOUTH AMERICA

Submitted by Claudimir Lucio do Lago (Guest Contributor)

Authors from Brazil contribute about 3% of the world's total peer-reviewed publications, putting this country in 13th position in terms of numbers of publications. This is the result of a great effort during the last decades. However, Brazil has been only in 58th position in a recent innovation ranking. This is a matter of concern for the central and local Brazilian governments. The University of São Paulo decided to initiate programs in order to encourage the spirit of innovation among its faculty members and students. One of these programs, the *Innovation Olympics at USP*, awarded last year the first place to a group of students and faculty members who developed a contactless-conductivity-based sensor for biomolecular interaction analysis. The patented device is based on a capacitively coupled contactless conductivity detector (C⁴D) that was originally developed for capillary electrophoresis. The surface of the dielectric is chemically modified, allowing the effect of bioreceptor/ligand interactions on the cell impedance to be utilized for chemical sensing.



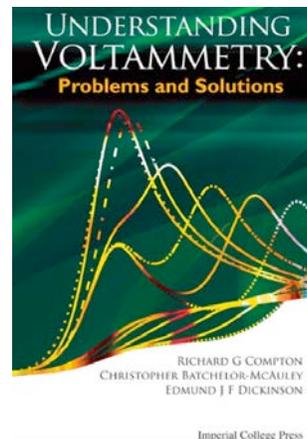
Support from 3M – a well-known innovation-based company – for the *Innovation Olympics at USP* program included a visit of the winners to its headquarter in Minnesota. The activities included also a visit to the Department of Chemistry of the University of Minnesota, where the visitors shared their experiences with local students and faculty members.

Claudimir is associate professor at the Departamento de Química Fundamental, Instituto de Química–Universidade de São Paulo. Learn more about Claudio at <http://www2.iq.usp.br/docente/?id=claudemi>.

REPORTS FROM OUR STUDENT EDITORS

Submitted by student editor Xu U. Zou

Understanding Voltammetry: Problems and Solutions fills a void by presenting many voltammetry work problems, introduced with experimental details and explicit questions, and followed by detailed answers. This very reasonably priced book covers a wide range of voltammetry topics, from thermodynamics and kinetics to experimental analysis. It presents problems and solutions in both basic theory and practical applications, along with many relevant references. Besides fundamentals of electron transfer, diffusion, microelectrode and macroelectrode voltammetry, homogeneous kinetics, and adsorption, it also includes more specialized topics such as those of weakly supported media and nanoscale electrodes. Although a companion volume to the textbook *Understanding Voltammetry*, this book can also be used independently or as a supplement to other electrochemical textbooks. Personally, I recommend this book to those who are taking electrochemical courses and need practice problems, but also to anyone who wishes to perform voltammetric measurements in the laboratory and has to interpret the resulting data. With its many work problems, this book enhances the understanding of voltammetry and improves the skills of its reader in interpreting data from actual experiments. A mastery of voltammetry is not required to read this book; an advanced physical chemistry course should suffice.



Understanding Voltammetry: Problems and Solutions, Compton, R.G.; McAuley, C. B.; Dickinson, E. J. F., Imperial College Press, 2011.

JOB OPENING

Andas Inc.: Post-Doc with Extensive Chemistry Background Needed for Quantum Capacitance Varactors in Wireless Sensing Applications

A fully funded start-up company named Andas Inc. working with licensed technology from the University of Minnesota is looking to hire a full-time post-doc for a year-long project focused on the functionalization of graphene and its pairing to an established wireless sensing device. As the lead/solo researcher on this project, the candidate will work under the loose guidance of an electrical engineer with expertise in microelectronics and a chemist with electrochemical sensor expertise. Candidate must be willing to work independently in a driven matter with oversight coming from the co-founders of the company. Goals of the year-long project include the functionalization of graphene and pairing the sensor technology with a wireless near-field communication system to create a sensitive and specific wireless sensing device.

The position will be paid with negotiable benefits, and the company will grant full publication rights. Candidate will work in an established Nanofabrication Center and graphene testing facility with separate office space. The work accomplished by the candidate will produce the “proof of concept” necessary for the company to take its product to the development stage. Ultimately the product will be a mass-marketed device that will have many different fields of use. Fabrication, layout software and circuitry experience are all highly encouraged for both the functionalization and electronic pairing steps. Interviews and the hiring process will begin as soon as possible and this project will necessitate a move to Minneapolis.

Further detail with specifics of the project can be obtained by contacting Joe Jensen (co-founder of the company) at jjensen0927@gmail.com Feel free to contact him with any questions beforehand. If interested in applying, please attach a resume and cover letter.

NEWS FROM MEMBERS

Susan Lunte, Ralph N. Adams Distinguished Professor of Chemistry and Pharmaceutical Chemistry is one of four faculty members at the University of Kansas who have been named recipients of the state’s most prestigious recognition for scholarly excellence, the Higuchi-KU Endowment Research Achievement Awards. The four were recognized on Friday, Nov. 2, during a ceremony at the Lied Center of Kansas. Read more at this <http://clas.ku.edu/>.



University of Minnesota’s **Christy Haynes** was named *Popular Science* magazine's "Brilliant 10", an honor that recognizes an elite group of young scientists whose research is expected to dramatically impact their fields. Haynes and her colleagues recently formed the Center for Analysis of Biomolecular Signalling within the University of Minnesota Department of Chemistry. The research will be focused on learning more about how cells in the body send chemical signals to each other during immune response, blood clotting, muscle firing and more. Read more at <http://www1.umn.edu/news/news-releases/>.



Andy Gilicinski (PhD Evans, 1987) is now Vice President of Product Development at Georgia-Pacific, where he leads innovation and product efforts for GP's consumer products businesses. He is expanding the innovation organization and a number of job openings are available for strong scientists interested in technology development or consumer-driven product creation.

Robert M. Ianniello (Vice President, Analytics and Services) was recently appointed Adjunct Professor (Visiting Scholar) in the Department of Chemistry and Chemical Biology at Rutgers University (New Brunswick). The appointment was based on his successful teaching of a graduate level course in Electroanalytical Chemistry in the Spring 2012 semester and the very positive feedback from both the students and faculty on the utility of the course information on electrochemical techniques being used in their laboratories. The syllabus he developed combined all of the theoretical aspects of potentiometry, amperometry, and coulometry, with real world industrial applications. The department chair intends to make the course a standard offering every year.

Pine Research Instrumentation is pleased to announce their newest team member, **Tim Paschkewitz** as their Electroanalytical Sales Scientist. Tim earned his Ph.D. from the University of Iowa under the direction of Dr. Johna Leddy. PRI reports that they are excited to bring another electrochemist into their sales team to provide their customers with additional support and personal follow-up from a technical perspective. Tim will be making lab visits around the country—please let PRI know if you would like him to stop by and visit your lab. PRI: *“Tim will be representing Pine at many upcoming conferences, so stop by and introduce yourself! He is eager to meet you.”*

Royce Murray has been selected as a Fellow of the ACS and was recognized at the Philadelphia ACS National meeting.

Distinguished Professor Emeritus of Chemistry & Pharmaceutical Chemistry **George S. Wilson** has been selected as the 2012 recipient of the J. Calvin Giddings Award for Excellence in Education by the Analytical Division of the American Chemical Society (ACS). The Giddings Award is presented each year to an ACS member who has enhanced the personal and professional development of students in the study of analytical chemistry. Two other Jayhawks who have won this award: Ted Kuwana (2004) and Cindy Larive (2007).

Christian Amatore (Ecole Normale Supérieure/CNRS, Paris, France) will serve as President-Elect of the International Society of Electrochemistry (ISE) for the term 2013-2014. He will then serve as ISE President in 2015-2016, and as Immediate Past President in 2017-2018.

Joaquín Rodríguez-López received his Ph.D. in analytical chemistry from the University of Texas at Austin working under the supervision of Prof. Allen J. Bard. He then did a post-doctoral stay at Cornell University in the laboratory of Prof. Héctor D. Abruña. He joined the University of Illinois at Urbana-Champaign faculty in Fall of 2012. He is interested in the study of electrocatalysis and the reactive heterogeneity in electrodes using Scanning Electrochemical Microscopy (SECM) and in methods of electrochemical analysis such as the ion transfer across liquid-liquid interfaces (ITIES) and electrogenerated chemiluminescence (ECL). Joaquín is a native of Mexico and obtained his B.Sc. at the Tecnológico de Monterrey in north Mexico.



HOW EASY IT IS TO BECOME A SEAC MEMBER

Any individual with an interest in electroanalytical chemistry is invited to join SEAC. Regular one-year membership dues are \$30. Student dues are \$10. Dues are payable on January 1 of each year. A lifetime membership option is available for \$300, payable either as a lump sum or in three annual, nonrefundable installments of \$100.

To become a new member of SEAC, go to <http://electroanalytical.org/membership.html> and fill out the downloadable membership form.