

## ECS 2015 Summer Fellowship Winners

Each year ECS awards Summer Fellowships to assist students in continuing their graduate work during the summer months in a field of interest to the Society. Congratulations to the following five Summer Fellowship recipients in 2015. The reports of the 2015 Summer Fellows will appear in the winter issue of *Interface*.



**GEN CHEN** is the recipient of the 2015 ECS Edward G. Weston Summer Fellowship. He is currently a PhD candidate in the Department of Chemical and Materials Engineering at New Mexico State University, working with Hongmei Luo on the nanoscale engineering of heterostructured composites for energy conversion and storage. He received his BE (2009) and MS (2012) in materials science from the Central South University, China.

He has published more than 20 papers in peer-reviewed journals, given many presentations, and been serving as a reviewer for many electrochemical energy storage-related journals. In 2014, he and his colleagues developed a synthetic strategy of “solvothermal route based in situ carbonization to transition metal compounds with carbon,” which can be extensively applied for the acquiring of electrode materials with good electrochemical performances. During his academic program, he has also been awarded the merit-based Enhancement Award and Outstanding Graduate Award by New Mexico State University many times. In the future he pictures himself to be a researcher with a strong desire to make novel nanomaterials and nanostructures widely applied in the electrochemical energy storage field.



**HADI KHANI** is the recipient of the 2015 ECS Colin Garfield Fink Summer Fellowship. He received his BS degree in Chemistry from the University of Aark, Iran, in 2007. He then joined Tarbiat Moallem University (now Kharazmi University) and was awarded his MSc in Analytical Chemistry under the supervision of M. H. Mashhadizadeh. For his MSc research, he worked on ion-selective electrodes and electrochemical sensors. After his MSc graduation

in 2009, he joined the Iranian Research & Development Center for Chemical Industries where he worked on multidisciplinary industrial research projects. In 2012 he began his PhD study in the Department of Chemistry at Mississippi State University (MSU) under the supervision of David Wipf. At MSU, he has undertaken a research program that not only includes work in chemistry but also research activity to support a minor degree in mathematics and statistics. His PhD research is mostly focused on scanning electrochemical microscopy (SECM) and supercapacitors. For his summer fellowship, he has proposed a high-resolution SECM imaging based on nanometric size pH electrodes to study the “crystal structure orientation-electrocatalytic activity” relationship of Pt and Ir oxide surfaces for water-splitting, ORR, and HOR reactions.



**MOHAMMAD MAHDI HASANI-SADRABADI** is currently a graduate researcher studying bioengineering at Georgia Tech. Aside from his current studies, Hasani-Sadrabadi spent time at the Swiss Federal Institute of Technology in Lausanne, where he developed microfluidic platforms for controlled synthesis of polymeric nanoparticles. In 2007, he began his research on fuel cells while at Amirkabir University of Technology. He continued to establish

the Biologically-Inspired Developing Advanced Research (BiDAR) group as an international collaborative research time. His main research area of interest is the development of bio-inspired nanomaterials for energy and biomedical applications which the results of his researches are published as more than 40 peer-reviewed papers with average impact factor of about 5.3 in different journals with total citation of about 750 and his h-index is 17. Among his many awards are the ACS CELL Student division award (2015), ECS Joseph W. Richards Summer Fellowship (2015), ECS

Industrial Electrochemistry and Electrochemical Engineering Division Student Achievement Awards (2015), POOIA Student Scholarship, (2015), and Grand Prize Winner of Dr. Baker Award for Fuel Cell Research (2012).



**RAPHAËLE CLÉMENT** is the recipient of the 2015 ECS F.M. Becket Summer Fellowship. Raphaële obtained her BA and MSc in Natural Sciences (Chemistry) at the University of Cambridge. She spent her third year of undergraduate studies at the Massachusetts Institute of Technology (MIT), as part of the Cambridge-MIT Exchange (CME), and worked in the research group of Daniel Nocera on the CoPi water oxidation catalyst. While working

on her Masters, she spent time at the European Nuclear Magnetic Resonance facility (CRMN) in Lyon, France, working under the co-supervision of Clare Grey, Lyndon Emsley, and Guido Pintacuda on the study of the  $\text{LiFe}_x\text{Mn}_{1-x}\text{PO}_4$  lithium-ion battery cathode using paramagnetic solid-state Nuclear Magnetic Resonance. Raphaële is currently a PhD candidate in the Department of Chemistry of the University of Cambridge, under the supervision of Clare Grey. Her thesis research focuses on layered sodium transition metal oxides for sodium-ion battery cathode applications, investigated using a combination of ab initio Density Functional Theory calculations and solid state Nuclear Magnetic Resonance. Her collaborations with the research groups of Shirley Meng (UCSD), Peter Bruce (Oxford), and Teofilo Rojo (CIC EnergiGUNE), have been very successful and have led to publications in high-impact journals. In September 2014, she co-organized an international conference and workshop on the “New Developments in Experimental and Theoretical Nuclear Magnetic Resonance Techniques for the Study of Paramagnetic Materials” in Cambridge, UK.



**ALEXANDER J. PAK** is the recipient of the 2015 ECS H. H. Uhlig Summer Fellowship Award. In 2010, he received his BS in Chemical Engineering from the Massachusetts Institute of Technology. Here, he developed a passion for solving global challenges such as energy conversion and storage, water purification, and affordable medical care and diagnosis. Alex is currently a PhD candidate in Chemical Engineering at the University of Texas at

Austin under the guidance of Gyeong S. Hwang. His thesis research is focused on understanding fundamental charge storage mechanisms at the interface of graphene-based materials, with a specific emphasis on supercapacitor applications, by utilizing a combined density functional theory and classical molecular dynamics computational approach. He has co-authored 11 peer-reviewed journal publications, presented his research at numerous national society conferences, and is a co-inventor on a patent. Outside of research, Alex enjoys mentoring middle-school and high-school students in the principles of nanotechnology and computational research. He is also actively involved as a member of the Graduate Chemical Engineering Leadership Council. ■

## 2015 Summer Fellowship Committee

**Vimal Chaitanya, Chair**  
New Mexico State University

**Kalpathy B. Sundaram**  
University of Central Florida

**Peter Mascher**  
McMaster University

## Student Award Winners



**MATTEO BIANCHINI** has been named the Battery Division's 2015 Student Research Award recipient. He began his scientific career at the Polytechnic University in Milan, where he obtained his Bachelor's degree (2009) and Master of Science (2012) in Physics Engineering. During this time, Bianchini had many transformative experiences in the sciences, including a semester spent at the University of Amsterdam in 2010 as part of the Erasmus Programme.

In 2011, Bianchini gained experience in the world of large scientific instruments through and internship with ID26, where he worked on x-ray absorption and emission spectroscopy. Bianchini's PhD focused on advanced characterization of electrode materials for lithium-ion and sodium-ion batteries.

Bianchini's research focuses primarily on real-time (operando) diffraction experiments using neutrons, x-rays, and synchrotron radiation to student lithium and sodium (de) intercalation processes inside rechargeable batteries. Through collaboration with different institutes on this project, Bianchini has been able to access different domains of electrochemical and diffraction fields.



**ERIC SCHINDELHOLZ** has been named the Corrosion Division's 2015 Morris Cohen Graduate Student Award recipient. He is a senior member of technical staff at Sandia National Laboratories. He received his PhD in Materials Science at the University of Virginia (UVA) in 2014 under the direction of Professor Robert Kelly. His graduate work focused on understanding the interrelationship between the hygroscopic behavior of marine atmospheric particles and the humidity dependence of steel corrosion associated with these particles.

Prior to his studies at UVA, Schindelholz served as a conservator in both federal and private institutions, specializing in the corrosion assessment and mitigation of historic artifacts and monuments.

His present work includes electrochemical measurement and modeling of atmospheric corrosion, corrosion in supercritical fluids and advanced materials. ■

*The student award winners will each be giving an award talk at the upcoming Phoenix meeting. See page 32 in this issue for more information about the time and place of these talks.*



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The Electrochemical Society

## Student Chapter News

## Indiana University Student Chapter

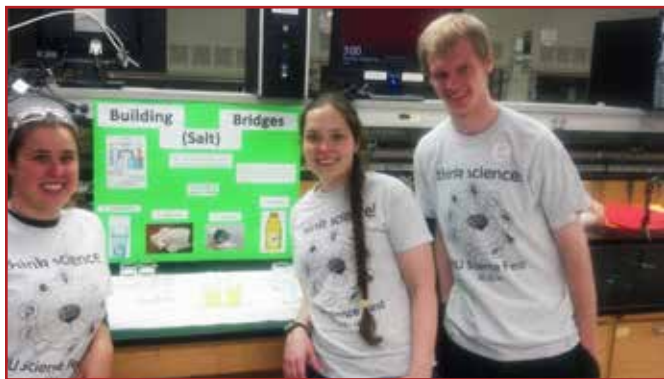
Students of Indiana University have continued to promote The Electrochemical Society this year on the Bloomington campus. In addition to regular social activities such as decorating cookies and playing friendly volleyball matches, the Chapter participated in the campus-wide Science Fest and organized a seminar speaker visit.

On October 25, 2014, our Chapter prepared a chemistry room to showcase electrochemical science at the Indiana University inaugural Science Fest (expanded from the Chemistry Open House, which was organized in previous years). In keeping with the theme of science in food, members set up a demonstration of cyclic voltammetric detection of capsaicin and used a multimeter to determine whether a popular sports drink is a good salt bridge and able to pass as much current as salt water (young scientists determined that it behaves more like sugar water). The Chapter also held a Minute-to-Win-It-like electron relay race to demonstrate changing oxidation states. The

most popular activity by far, however, was the creation of “Squishy Circuits” using insulating sugar and conductive salt doughs. They encouraged visitors to get creative with their circuit-sculpture designs and showed them that, if they incorporated a light-emitting diode in the dough three-dimensional circuitry connected to a power supply, they would be able to turn on the light. This sparked a lot of great discussions about conductivity and circuitry components.

A third annual spring seminar was organized to host (by Chapter member vote) guest speaker, Nathan Lewis, the George L. Argyros Professor of Chemistry at the California Institute of Technology. Professor Lewis was enthusiastic about spending as much time with students as possible; immediately after his arrival in Bloomington, he met with Chapter members for a dinner and social time. Much of his visit was spent meeting with various research groups and discussing the challenges of individual student projects. Professor Lewis then was invited to present a seminar in his own charismatic style, highlighting his work with artificial photosynthesis. Following the April 8, 2015 seminar, Professor Lewis again met with students at a reception to further discuss aspects of his work with charge transfer and anode/cathode development. Our friends, electrochemistry students from the University of Illinois, drove through rough weather to join the Chapter for this seminar and were able to discuss their research with him at this time as well. He continued debating energy advances up until the moment chapter officers saw him off to the airport.

The Chapter is grateful for the opportunities that ECS provides in meeting with such accomplished and enthusiastic speakers, and is eagerly looking forward to planning next year’s events. ■



Indiana University Student Chapter members (left to right) LAUREN STRAWSINE, ERIN MARTIN, and JOHN ROSE at the Science Fest.



The members of the Indiana University Student Chapter with seminar speaker NATHAN LEWIS (fourth from left).



## Montreal Student Chapter

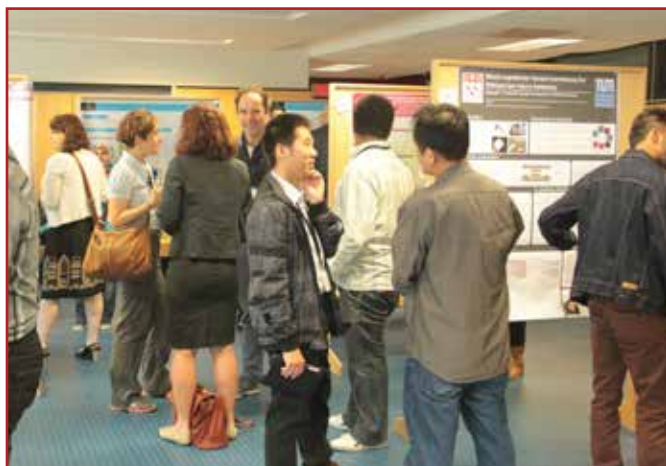
The 5<sup>th</sup> ECS Montreal Student Symposium took place on June 5, 2015, at McGill University, Canada, sponsored by Pine Research Instrumentation, Metrohm Canada, SnowHouse Solutions, Centre québécois sur les matériaux fonctionnels (CQMF), McGill Chemistry, Association étudiante du Secteur des sciences de l'Université du Québec à Montréal, and the Post-Graduate Students' Society of McGill University. More than ninety participants took part in the annual symposium, hailing from eight universities in Montreal, Sherbrooke, Halifax, London, as well as a national research center. The attendees enjoyed 16 talks and 16 posters, including the two invited presentations of Jeff Dahn (Dalhousie University) and Dominic Rochefort (Université de Montréal). Prof. Dahn's talk entitled "Advanced Diagnostics to Learn about Li-ion Battery Failure Mechanisms" discussed novel characterization and tools

to diagnose Li-ion batteries performance. Moreover, he mentioned that, starting in next July, his industrial partnership was moving with Tesla. On a related topic, Prof. Rochefort presented his recent research entitled "Electroactive Ionic Liquids in Energy Storage Devices" about future electroactive ionic liquid electrolytes for potential application in batteries.

Prizes for the best oral and best poster presentations were awarded to Mark McArthur from McGill University for his talk on "Mixed Metal Oxide / Functionalized Carbon Nanotube Composite Electrodes for Electrochemical Energy Storage," and Andrew Danis from McGill University for his poster on the "Electrogenerated Chemiluminescence (ECL) of Self-Assembled Ruthenium-Containing Nanospheres for Bioassay Applications." Further information about the ECS Montreal Student Chapter can be found at <http://ecsmontreal.blogspot.com> or visit us on Facebook.



The 5<sup>th</sup> ECS Montreal Student Symposium attracted more than ninety students and faculty members from Montreal, Sherbrooke, Halifax, and London universities and research centers.



Students in discussions during the poster session.



ECS Montreal Student Chapter committee.

## STUDENT PROGRAMS



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ECS Divisions offer **AWARDED STUDENT MEMBERSHIPS** to qualified full-time students.

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► **Note**

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*February 12, 2016*  
229<sup>th</sup> ECS Meeting, San Diego, CA

*June 10, 2016*  
PRiME 2016, Honolulu, HI

### Summer Fellowships

The ECS **SUMMER FELLOWSHIPS** were established in 1928 to assist students during the summer months.

The next round of Fellowships will be presented in 2016.

Please visit the ECS website for complete rules and nomination requirements.

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*January 15, 2016*





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