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## OCACS Elements

The Orange County Local Section wants to hear from you. If you would like more information about our section or how you or your company can contribute to our Section's efforts, please visit our [website](#) or contact us at [OCACSChair@gmail.com](mailto:OCACSChair@gmail.com).

Visit our Website

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## Chair's Message

In the past several weeks, I was able to attend a couple of ACS-related activities, including the First Annual Orange County High School Chemistry Symposium at the University of California, Irvine (UCI) on March 9th, 2019 and California State University, Fullerton (CSUF) Chemistry & Biochemistry Club (CBC) meeting on February 21st, 2019.



I was very interested in attending the High School Chemistry Symposium as a university chemistry instructor (one of my day jobs is teaching chemistry to engineering students at CSUF) to learn how chemistry is taught in the high schools in OC. I found that the event was very well organized (Kudos to the organizing team led by Steve Sogo of Laguna Beach High School!) I found that the "Chemistry Technology Toolkit" by Stacy Hamamura (Trabuco Hills High School) and "Second Chance Chemistry" by Brent Shenton & Brady Bilhartz (Valencia High School) particularly interesting and useful for me. I also enjoyed chatting with some of the high school teachers and exchange ideas and information. It was such a great way to spend

a Saturday in March! I think that the high school students in OC are so fortunate to have many passionate chemistry teachers like them.



CSUF CBC is one of the very active chemistry clubs in our section

([http://www.fullerton.edu/chemistry/students/chemistry\\_biochemistry\\_club.php](http://www.fullerton.edu/chemistry/students/chemistry_biochemistry_club.php)).

They are also reactivating their ACS Student Chapter status. At their second meeting in Spring 2019 semester, CBC president Rachel Bauer and secretary Linh Kim introduced the chemistry experiment to be done during their upcoming STEAM outreach event at Fern Drive Elementary School. The CBC members tried the home-made pH paper (with cabbage juice!) to check the pH of lemon juice, baking soda, and coke. That was fun! CBC is holding many events in this semester. I am looking forward to visiting them again. As announced in the last month's newsletter, OCACS is collaborating with CSUF CBC to organize the Earth Week workshop as well (please see below). At OCACS, we are interested in collaborating with undergraduate students and supporting their activities.

We are planning to have many events in March, including Dinner Meeting and Environmental Group Meeting. Please see below for more information. Our Education Committee members are working hard on High School 1<sup>st</sup> Year Exams and College Award Dinner organization. Please check our website (<https://ocacs.sites.acs.org/>) for the information about these upcoming events.

I hope to see you soon at one of these events!

Dr. Keisuke Ikehata  
Chair, Orange County Section  
American Chemical Society



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## The Successful First Annual OC High School Chemistry Symposium

On March 9th, 2019, 35 chemistry teachers attended the 1st Annual Orange County High School Chemistry Symposium at the University of California, Irvine.

Participants enjoyed networking



with other teachers from OC while learning from the presentations made by 7 accomplished So Cal high school teachers.

There was a lot of communication that occurred during the breaks and lunch as teachers informally conversed with each other. Dr. Renee Link led a tour of the new teaching facilities (including a collaborative classroom for 110 students).

Survey results show that 85% of participants plan to return next year.

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## March Dinner Meeting, March 21, 2019

The Doubletree Club Hotel  
7 Hutton Centre Drive, Santa Ana  
Phone: 714-751-2400

Social: 5:30 PM  
Dinner: 6:00 PM  
Program: Presentation: 7:20 PM



### Speaker:

**Dr. Shane Ardo**  
**Assistant Professor of Chemistry**  
**University of California, Irvine**

### Presentation:

#### **New OPVs where water is the semiconducting medium and $H^+/OH^-$ are the charge carriers**

#### **Abstract:**

Most electrochemical technologies that operate under ambient conditions require ion-conducting polymer electrolytes. These polymers are *passive* in that electric bias drives ion migration in the thermodynamically favored direction. Recently, my group engineered two important features into passive ion-selective polymers to introduce the *active* function of photovoltaic action and demonstration of an ionic solar cell. These features were covalent bonding of photoacid dyes to the polymers such that absorption of visible light resulted in liberation of protons, and synthesis of polymer membranes with charge-selective contacts to facilitate separation and collection of  $H^+$  and  $OH^-$ . Light excitation from either side of the polymer membranes resulted in  $H^+$  dissociation followed by directional charge collection. The charge collection direction was dictated by the electrostatic asymmetry in the polymers, which was formed due to an external pH difference setup across the membrane.

Joining a monopolar cation-selective polymer to a monopolar anion-selective polymer forms a bipolar membrane, which mimics a rectifying semiconductor pn-junction diode in form and function, and is able to maintain pH differences across it. Using a photoacid-dye-modified bipolar membrane, we measured a photovoltage of ~120 mV under conditions of solar-simulated excitation. In addition to more traditional electrochemical techniques, insights into materials function were obtained using finite-element numerical modeling of photoacid kinetics and membrane physics; beam-line x-ray scattering measurements; electrochemical impedance, solid-state NMR, and pulsed-laser spectroscopies; and fluorescence, electron, and force microscopies. Collectively, these photo-responsive polymers represent a new class of functional materials that use light to trigger changes in local ion concentration and electrostatic potential. These local changes can be used to affect macroscopic processes such as direct sunlight-driven redox chemistry or desalination of salt water, chemical catalysis, and triggering of cellular processes.

### **Biography:**

Shane obtained a B.S. Degree in Mathematics, with a minor in Computer Programming, from Towson University and subsequently worked as a software engineer, community college instructor, and high school teacher prior to attending graduate school. Shane obtained an M.S. Degree in Nutrition from the University of Maryland, College Park followed by M.A. and Ph.D. Degrees in Photo-Physical Inorganic Chemistry from the Johns Hopkins University, where he worked for Prof. Jerry Meyer. He then worked for Prof. Nate Lewis as a DOE-EERE Postdoctoral Research Awardee at the California Institute of Technology until 2013. Since that time, Shane has been an Assistant Professor at the University of California, Irvine in the Department of Chemistry and holds a joint appointment in the Department of Chemical Engineering and Materials Science. He leads the Ardo Group for Molecular-Level Engineering of Functional Materials, which designs, synthesizes, and characterizes molecule-materials hybrids and aims to understand and control reaction mechanisms at asymmetric interfaces with the goal of optimizing energy conversion for practical applications, including solar seawater desalination, solar fuels devices, photovoltaics, fuel cells, and batteries. In 2016, Shane was named one of five inaugural Moore Inventor Fellows. He is also a recipient of a DOE Early Career Research Award and a Beall Innovation Award, and was named a Sloan Research Fellow, a Cottrell Scholar, a Kavli Fellow, and a Scialog Fellow. Shane has given over 100 invited talks, including at the National Academy of Sciences Distinctive Voices Lecture Series, the 2017 Resnick Institute Young Investigators Symposium, and Apple's Membrane R&D Division. His research group is also supported by funding from the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy, the U.S. National Science Foundation's Chemical Catalysis Program, Nissan Chemical Industries Ltd., and collaborative projects funded by University of California MEXUS-CONACYT and Research Corporation for Science Advancement.

### **Reservations:**

All Reservations: Please contact us as soon as possible, but no later than noon on Tuesday, March 19, 2019 at [OCACS@SBCGLOBAL.Net](mailto:OCACS@SBCGLOBAL.Net) Please indicate if you will be attending the dinner and program or the program only. Also, please list all names of attendees. Note if parking lot is full ask the valet staff where to park.

**Note:** OCACS pays the hotel based on the number of dinner reservations made. Your RSVP for dinner is a commitment to pay for dinner. Dinner cost is \$30 for members and member's significant others; \$35 for non-members or those

without reservations. There is no charge for attending the program only. However, voluntary donations will be accepted to help defray meeting costs. The section's address is OCACS, P.O. Box 211, Placentia CA 90871. The first five students who register for a meeting will receive a \$10 discount.

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## Education Committee Chemistry Olympiad, Part I

There were 160 participants representing 45 different high schools (both record highs) who took the part 1 exam on March 2, 2019, at Irvine Valley College. The average score was 33.2 or 55.3%. The students listed below have qualified for the national test to be held at Vanguard University on April 27.

Name	School	Score
Anton Ni	University	58
Rohan Chawla	University	57
Ian Grimm	Sage Hill	56
Valentin Kirilenko	Capistrano Valley	55
Jiwon Jeong	Valencia	55
Bibo Feng	Irvine	54
James Chen	University	54
Joseph Dong	Troy	52
Aayush Somani	Valencia	52
Andy Fong	Los Alamitos	51
Samuel Martinez Gross	Fairmont	50
Felianne Teng	Troy	50
Edward Jin	Beckman	

Below are the top twelve team scores for the county. Each of the four students from the **top seven schools** (due to the tie at sixth place) will also be honored at the awards dinner on May 21, 2019.

School	Score
Troy	189
Valencia	186
Sage Hill	180
University	177
Beckman	170
Los Alamitos	164
Northwood	164
OCSA	150
Tesoro	149
Oxford	142
Saint Margaret's	141
Sunny Hills	136

If you are interested in joining the committee (meetings in Sept/Oct, Nov, Jan, March, June), please contact Carol Grimes at [cgrimes@gwc.cccd.edu](mailto:cgrimes@gwc.cccd.edu).

## Environmental Committee Meeting, March 28, 2019

### Environmental Application and Implication of Nanotechnology

**Dr. Adeyemi Adeleye**  
Assistant Professor, Department of Civil  
and Environmental Engineering, University  
of California, Irvine



Thursday, March 28th, 2019 at 7:30 pm

#### Biography:

Adeyemi Adeleye earned master's and doctoral degrees from UC Santa Barbara (UCSB) in environmental science and management; and joined UC Irvine's civil and environmental engineering department in July 2018. He previously served as a National Research Council postdoctoral research associate at the U.S. Environmental Protection Agency and as a postdoctoral scholar at UCSB's Center for Environmental Implications of Nanotechnology. Adeleye's research focuses on emerging contaminants as well as the environmental applications of nanotechnology. Adeleye is a member of the American Chemical Society, the Society of Environmental Toxicology and Chemistry, and the Sustainable Nanotechnology Organization.

#### Abstract:

Nanotechnology, the manipulation of matter at the nanoscale, can contribute to environmental sustainability via applications that can improve energy storage, water treatment and pollution remediation, among others. However, nanotechnology applications may lead to release of engineered nanomaterials into the natural environment, and the implications of this exposure are poorly understood. This seminar will focus on the application of nanoscale zerovalent iron (nZVI) for heavy metal removal, showing how the engineered nanomaterial

can be modified to improve its performance. The influence of biogeochemical parameters on the transformation and toxic effects of nZVI will be considered, with the goal of improving the sustainable application of nZVI for environmental remediation.

**Location:**

Kennedy/Jenks Consultants, 3200 El Camino Real, Suite 200, Irvine, CA 92602

**To Register or for more information:**

Contact Dr. Ganesh Rajagopalan at

[RGanesh@KennedyJenks.com](mailto:RGanesh@KennedyJenks.com) by Tuesday, March 26th, 2019.

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## **Earth Week Permeable Concrete Workshop at California State University, Fullerton, April 23 and 25, 2019**



To celebrate the Earth Week 2019, we will hold a technical tour and an innovative two-day workshop to learn the environmental benefits of permeable concrete, including surface runoff reduction, flood prevention, and groundwater recharge, and how to produce permeable concrete using sustainable alternative ingredients, such as fly ash and paper. The workshop will provide the participants opportunity to learn the impacts of traditional cement production and produce a decorative sample-size concrete piece to take home.

This innovative program will be a joint effort of the OCACS, California State University Fullerton (CSUF) ACS Student Chapter (Chemistry & Biochemistry Club, CBC). Within the OCACS, Environmental Committee, Younger Chemists Committee, and Women Chemists Committee are collaborating.

If you are interested in this Earth Week event, please contact the workshop leader, Monica Gutfinger ([monicagutfinger@gmail.com](mailto:monicagutfinger@gmail.com)).

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### **Younger Chemists Committee (YCC)**

The YCC of OCACS has been organizing and executing chemistry events at the Children's Hospital of Orange County clinic since July 2018. We bring supplies to the hospital to set up science experiments for patients and their families to boost their interest in science, especially



chemistry. It is important for us to do experiments that can easily be re-created at home, so the children can further explore their curiosity. Some experiments include “Lava Lamps,” “Elephant Toothpaste,” and “Non-Newtonian Slime,” among many others. If you are interested in joining the next YCC's event, please contact the committee chair Amanda Bjornstad ([amandabjornstad@gmail.com](mailto:amandabjornstad@gmail.com)).

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## Get Involved & Support OCACS

If you want to network with over 1300 chemists in Orange County, host a technical tour, speak at one of our dinner meetings or science cafes, explore leadership opportunities, or advertise with our Section, please visit our [website](#) or E-mail us at [OCACSLocalSection@gmail.com](mailto:OCACSLocalSection@gmail.com) and [OCACSChair@gmail.com](mailto:OCACSChair@gmail.com).

We would love to hear from you!

## OCACS 2019 Executive Committee

Chair	Dr. Keisuke Ikehata	<a href="mailto:keisuke.ikehata@yahoo.com">keisuke.ikehata@yahoo.com</a>
Chair-Elect	Dr. Richard Deming	<a href="mailto:rdeming@fullerton.edu">rdeming@fullerton.edu</a>
Past Chair	Dr. Sandra Thompson	<a href="mailto:OCACSWCC@gmail.com">OCACSWCC@gmail.com</a>
Treasurer	Mr. Robert Cohen	<a href="mailto:cohenr@sbcglobal.net">cohenr@sbcglobal.net</a>
Secretary	Dr. Beverly Matsuda	<a href="mailto:BevMatsuda@iusd.org">BevMatsuda@iusd.org</a>
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