

THE VORTEX

AMERICAN CHEMICAL SOCIETY
VOLUME LXXVII NUMBER 8

CALIFORNIA SECTION
OCTOBER 2016



Rollie J. Meyers 1924-2016

Professor Emeritus, born 1924; B.S. California Institute of Technology (1947); M.S. California Institute of Technology (1948); Ph.D. University of California (1951); Guggenheim Fellow (1957-8); Faculty Senior Scientist, Lawrence Berkeley National Laboratory; ACS International Award Fellow (1965-6); Visiting Professor, Harvard University (1970); Fellow, AAAS.

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*California Section, ACS
October Meeting Saturday October 22*

Speaker: Ronald Zuckermann, Ph.D. Facility Director of the Biological Nanostructures Facility and Senior Scientist at the Molecular Foundry at the Lawrence Berkeley National Laboratory Senior Advisor to the Molecular Foundry User Program

Title: "New Soft-Matter Nanomaterials at the Interface of Polymer Science and Structural Biology."

Date: Saturday, October 22, 2016, **ID AND PRE REGISTRATION REQUIRED**

11:30 AM, lunch: Place LBL building 54, Bay View Cafeteria, \$13 baguette sandwiches.

1:00 PM: talk, Perseverance Hall, building 54 (cafeteria), room (no charge)

Place: Lawrence Berkeley National Laboratory; 1 Cyclotron Road; Berkeley, Building 54 Room 130 Directions: <http://www.lbl.gov/Workplace/Transportation.html>

Access through Blackberry gate: go all the way up Hearst Ave in Berkeley, then follow the signs. (<http://www.lbl.gov/Workplace/lab-site-map-flash.html>).

Abstract: A fundamental challenge in materials science is to create synthetic nanoarchitectures that rival the structural complexity found in nature. A promising bioinspired approach is to synthesize sequence-defined polymer chains that fold into precise protein-like structures. In order to efficiently produce such information-rich polymer sequences, we use the automated solid-phase submonomer synthesis method to generate sequence-defined peptoid polymers up to 50 monomers in length. The method uses readily available primary amine synthons, allowing hundreds of chemically diverse sidechains to be cheaply introduced. We use this method, along with computational modeling, to design, synthesize, assemble and engineer a variety of protein-mimetic nanostructures. At the Molecular Foundry, we examine peptoid sequences that can form highly ordered

supramolecular assemblies of nanosheets and nanotubes, and compare their molecular structures to the fundamental structures found in biology.

Biography: Ronald Zuckermann's primary research effort is on mimicry of biological architectures using bio-inspired polymers. He received his B.S. in Chemistry in 1984 from Harvey Mudd College where he did undergraduate research in synthetic organic chemistry. He then went on to UC Berkeley to study Bioorganic Chemistry with Prof. Peter Schultz. His thesis work was on the synthesis of semi-synthetic nucleases capable of the sequence-specific cleavage of RNA. After receiving the first Schultz group Ph.D. in 1989, he became one of the founding chemists at Protos Corp., a combinatorial drug discovery start-up in Emeryville, CA. There he helped develop several key drug discovery technologies

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Science ^{cafe}



Co-sponsored by

Lafayette Library and Learning Center Foundation

Mervyn L. Brenner Foundation, and the California Section, American Chemical Society

October 25 2016 Community Hall, Tickets \$10 Call 925 283 6513 X 102 Additional information at <http://www.lllcf.org/program/science-cafe-the-maker-movement/>
How the maker movement is changing our minds. Speaker Dale Dougherty, CEO and Founder of The Maker Movement, Maker Media, Inc.

THE VORTEX

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California Section Web Site: <http://www.calacs.org>

Chair's Message

With sadness, I report the passing of Professor Rollie Meyers on September 12. For many years, Rollie attended the monthly Executive Committee Meetings and it was our pleasure to look to find a chair next to Rollie and enjoy his humour and perspectives on scientific and contemporary issues prior to the start of the meeting and often during. Rollie died from a heart condition complicated by a recent bout with pneumonia. We will miss his participation in the Section and extend our condolences to his son, Keith and his daughter-in-law Mary, and all his family and friends for their loss. The date of a memorial service is not known at this time, but will be published on the Section's website when available. www.calacs.org.

We are getting into election season, not that you need a reminder. The Section will be using an electronic balloting system but, you can request a paper ballot. Additional information is on page 7 as well as on the website. Also available on the website will be a statement from each of the candidates outlining their goals for the Section.

Ballots for the National ACS were sent on September 30 containing information on the candidates for President Elect and Directors at Large. On the ACS site you type "elections" into search box and obtain each of the candidates statement, website and video. The two candidates for President-Elect, 2017 are Peter K. Dorhout, Kansas State University,

Manhattan, KS www.peterdorhoutACS.com, and Thomas R. Gilbert, Northeastern University, Boston, MA. <https://sites.google.com/site/thomasgilbertacs/>.

It has been one of my goals as Chair to have meaningful programs each month for our members. You can see in this issue the caliber of the speakers and topics. The Section also recognizes that our lives are busy, and taking the time to travel and attend meetings is challenging. The National ACS is also aware of the time and energy spent in going to meetings and has responding to our grant request with funds to develop teleconferencing capability. It is my plan to start the process this calendar year that will allow members to remotely and interactively attend meetings. We will start first with audio for the Executive Committee meeting each month, then move on with our YCC, WCC, and regular monthly programs. The second stage will be to add video and probably some webinars. The speed at which we will be able to implement the program, will depend in a large part how much help and how many volunteers we get. This is a request to volunteer your time and experience and help move the Section into the 21ST century LR101898@aol.com.



Mini Maker Faire

Sunday, October 23, 2016, 10-5 pm at Park Day School, 360 42nd St., and Studio One Art Center, 365 45th St. Oakland, Faire entrance is at corner of 42nd & Opal. Check www.calacs.org.

Family Science Night Report

On September 7th, the hottest day of the year, 2016, at César Chávez Middle School in Hayward, CA, we had over 100 students and parents who were thinking just one thing: Ice Cream! They had to wait for it, while enjoying music by the Scientific Jam and a colorful chemistry show by Bryan Balazs. Section Chair Lou Rigali welcomed visitors, and I introduced Dr. Sandra Sachs of the Oakland Police Department's Criminalistics Laboratory. Dr. Sachs and Tara Fahey, Police Forensic Specialist for the Napa Police Department, helped us bring to life this year's National Chemistry Week theme, "Solving Mysteries Through Chemistry."

The CSI activity station featured displays on the techniques used at Oakland's Criminalistics Laboratory (everything from DNA fingerprinting to analysis of drug samples), plus hands-on experience detecting "latent" fingerprints by dusting with graphite or cocoa powder. Thanks to Al Verstuyft for organizing this activity and inviting Tara Fahey, who was joined by OPD intern Jessica as they showed visitors how to dust for fingerprints. California Section Past-Chair Charlie Gluchowski helped kids investigate mystery perfume samples, comparing them to familiar aromas such as lemon (limonene) and geranium (geraniol). This display included illustrations of the molecular structures, and enthusiastic young chemists could build their own molecular models. Instructor Aparna Mukherjee of CSU East Bay was there to introduce students to DNA-RNA base-pairing and the double helix structure of DNA.

At the nearby Slime station, volunteers from Chevron showed chemists of all ages how to combine a water-soluble polymer (polyacrylic acid) with a cross-linking agent (borax) to produce this every-popular product. Continuing through the school garden, the next station on the program featured two more hands-on activities, Ancient Ink (prepared from oak gall tea and ferrous sulfate iron supplement tablets) and Strawberry DNA extraction. Mashed strawberries are a surprisingly easy source

of purified DNA, once you break down the cell walls with a little dish detergent and add some salt to help extract the DNA strands. Adding isopropanol (rubbing alcohol) precipitates the DNA as a clear, sticky gel. Thanks to ACS volunteers Boli Zhou, Dan Calef, and Iyun Lazik (Professor of Chemistry at San Jose City College) for their help at this station. Finally, the pH workshop station featured tests of many familiar household substances, a demonstration of the pH-indicating properties of red cabbage juice, and hands-on fun with colorful electrolysis. Thanks to Marlin Halim of Department of Chemistry & Biochemistry at CSU East Bay (and to her husband, Felix Fischer of UC Berkeley) and to Maher Kaliji for taking charge of these activities.

Back in the Multipurpose Room, Emily Bloom entertained kids with inspired face-painting while the ice cream crew (led by our recently-elected ACS Board member Lee Latimer, and assisted by Michael Cheng and Toni Miao of Chevron) got ready for production. At last it was time to add the liquid nitrogen (courtesy of AirGas San Leandro) stirring up clouds of water vapor while freezing the long-awaited treat. I finally had a chance to thank Principal Sean Moffatt, Assistant Principal Kevin Shinoda, and science teacher Andrea Espinoza for inviting us to Chávez Middle School.

Alex Madonik, family Science Night Coordinator



DNA Detection

*California Section, ACS/WCC
October Meeting Saturday October 29*

Speaker: Dawn A. Shaughnessy, Ph.D. "Superheavy Element Discovery
at LLNL

Place: Cal State University East Bay
Science Building South, Room 143
25800 Carlos Bee Blvd Hayward, CA

Time: 2:00 – 4:30 pm: Talk and tour,
Light refreshments served. Reservation
Event is FREE. Please RSVP by email
to the CA Section office: office@calacs.org,
or call at 510-351-9922, by October
21, 2016.

Biography: In 2010, Dr. Shaughnessy, was
appointed group leader for the newly created
experimental Nuclear and Radiochemistry
Group, which is currently part of the Nuclear

and Chemical Sciences Division at LLNL,
and is also the Responsible Scientist for
radiochemical debris collection at the
National Ignition Facility. In addition,
she is the project leader of the LLNL
heavy element program, which announced
discovery of element 117 in April 2010.
She has been a staff chemist at LLNL for 14
years. Most recently she was awarded the
DOE Office of Science Outstanding Mentor
Award (2010) and the Gordon Battelle Prize
for Scientific Discovery for the discovery of
element 117 (2010) and was inducted into
the Alameda County Women's Hall of Fame
for Scientific Discovery (2012).

California Section, November Meeting Thursday November 3

Speaker: Mako Masuno, PhD

"Conversion of Biomass to biobased-para-Xylene (A Formal Synthesis of Biobased
Polyethylene Terephthalate, bio-PET)"

Place: USDA, 800 Buchanan St., Albany, **Cost:** \$10.00 members and guests. No
charge Students and retired members., **Time:** 5:30 – 6:30 PM Social, 6:30 – 7:30 PM,
Presentation, Light snacks, sandwiches, and drinks. Please register, for meal or for talk
only by email to office@calacs.org, or by phone 510.351.9922.

Abstract: Unsustainable, fossil based
plastic—polyethylene terephthalate (PET)
dominates the current plastic bottle industry.
The challenge is to find alternative non-
fossil based starting materials and produce
a bio based PET bottle. Micromidas Inc. is
a chemical company in West Sacramento
that converts biomass to commodity
chemicals and resins. They have recently
developed and piloted technology that
will convert biomass, not oil, to polymer
grade p-xylene which can be used in the
polymerization of PET. They are planning
to start construction on a first-of-a-kind
commercial demonstration plant this year.
This talk will introduce Micromidas and
aspects of its core technology.

Biography: Mako Masuno, PhD is the Head
of R&D at Micromidas, Inc., a chemical
company that converts biomass to specialty
and commodity chemicals and resins. His
areas of expertise include natural product
biosynthesis & biomimetic synthesis,

pathway development and optimization,
and structure/property relationships.
Dr. Masuno has scaled up active drug
synthesis, natural product extractions,
biopolymer synthesis, biomass processing,
and distillation to the hundreds of kilograms
engineering scale. He has an excellent
knowledge of carbohydrate dehydration
chemistry, having contributed to the design
of Micromidas' furanics platform process
and scale up to para-xylene production.
Dr. Masuno has multiple publications and
patents. He was awarded the Mathematics
and Physical Science Dean's Graduate
Prize in the College of Letters and Science
in 2005 for excellence in teaching and
research, the 4th European Conference
on Marine Natural Product Participation
Award (2004), R.B. Miller Award (2004),
and the Bradford Borge Fellowship (2000-
2002). Dr. Masuno received his B.S. in
Chemistry from Westmont College and his
PhD in Synthetic Organic Chemistry from
the UC Davis.



Toxic Terra (Part 7)

Bill Motzer

In Part 5 (February 2016 Vortex), I discussed the toxic effects of environmental fluoride (F^-) particularly fluoride in groundwater. In Part 6 (June 2016), I covered some of the sources of fluoride, particularly from granitic terrain that impacts groundwater supplies largely in India and Pakistan. However, geothermal areas in rift zones and active volcanic belts also contain high fluoride in surface water and groundwater.

In general, fluoride releases to groundwater are largely dependent on chemical and physical processes occurring between groundwater and its geological environment. In many situations, fluoride in groundwater is contributed by fluoride-rich host rocks where fluorite (CaF_2) is often the predominant mineral controlling dissolved fluoride. In groundwater, fluoride concentrations generally vary with soil conditions (e.g., soil type and decreasing pH), climatic conditions (e.g., precipitation and evapotranspiration), rock-water interactions, residence time, and depth from the ground surface. High fluoride groundwater is often associated with neutral to alkaline pH, low calcium and high sodium and bicarbonate concentrations. Because such chemical and physical conditions have large variabilities, the spatial and temporal heterogeneities of fluoride groundwater concentrations, particularly in geothermal areas, may be quite large: fluorite's solubility is largely pH and somewhat temperature dependent. For example, the CaF_2 solubility product (K_{sp}) is 3.4×10^{-11} at $25^\circ C$, which gives a calculated solubility of 0.000215 mol/L or ~ 17 mg/L. In Figure 1, note that with increasing acidity, CaF_2 solubility also increases. Once disassociated [i.e. $CaF_2(s)$

$Ca^{2+}(aq) + 2F^-(aq)$] and mixed with groundwater under oxidizing and reducing conditions with a pH above ~ 3.0 , fluoride remains stable and concentrations tend to

increase over time.

High fluoride concentrations have been reported in geothermal and active volcanic belts in North America (e.g., Great Basin of the western USA), Eurasia (France, Russia, and China and Tibet), Africa, (Algeria, Tunisia, and in the nine countries of the East African Rift Valley), and volcanic island terrain such as Iceland, Taiwan, and New Zealand. Alkali-chloride with near-neutral pH are the most common geothermal water types having fluoride concentrations ranging from 1.0 to 10 mg/L. [The current World Health Organization (WHO) permissible level is 1.5 mg/L; the California drinking water primary Maximum Contaminant Level or MCL is 2.0 mg/L]. Associated with these waters are increased concentrations of dissolved silica and boron and elevated arsenic, ammonia, and hydrogen sulfide. If more acidic conditions occur, fluoride concentrations may reach greater than 1,000 mg/L, with fluoride often occurring

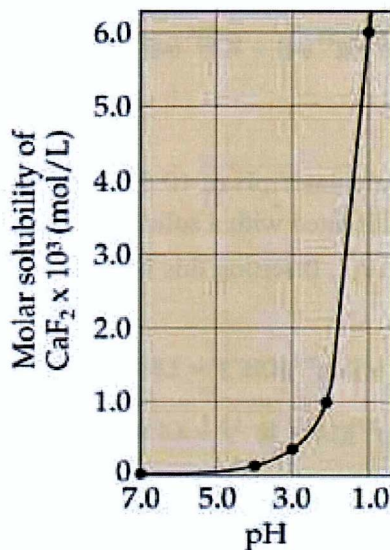


Figure 1: Effect of pH on CaF_2 solubility. Source: Brown, et al., 2012: Chemistry: The Central Science: Prentice Hall, Boston, MA, 1122 p.

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(Motzer continued from page 6)

as hydrofluoric acid (HF), bifluoride ion (HF_2^-), and silicon hexafluoride (SiF_6^{2-}).

As indicated above, most world populations affected by high groundwater fluoride concentrations live in the tropical countries where per capita water consumption is greater than the WHO estimate of 2 L/adult/day. For example, in Ghana, people consume 3 to 4 L/adult/day. Therefore, fluorosis risk is higher in such countries and therefore it's a serious problem in the world's heavily populated countries such as India, China, and those of east-central Africa.

China, with the world's largest population (as of September 2016, estimated at 1.384 billion people) and a current annual GDP growth rate of 6.7%, has inadequate and unevenly distributed water resources in the arid north and northwest where groundwater has been over-exploited largely for

agricultural irrigation where it also provides ~70% of drinking water resources. In many of these areas, geothermal waters contain naturally occurring arsenic and fluoride commonly linked to endemic diseases (i.e., arsenicosis and fluorosis) through drinking water exposure.

The alkaline volcanic province of the East African Rift Zone (EARZ) or valley extends through the countries of Eritrea, Djibouti, Ethiopia, Kenya, Tanzania, Uganda, Rwanda, Burundi and Malawi. The EARZ has some of the highest recorded worldwide fluoride concentrations with excessive fluoride occurring in hot springs, alkaline lakes, some river systems, and groundwater resulting in documented cases of severe dental and skeletal fluorosis.

In a future article, I will explore fluoride in water in these countries in more detail.



(Zuckermann continued from page 2)

such as robotic combinatorial library synthesizers, affinity selection methods and a novel class of heteropolymers called "Peptoids". Chiron Corp. acquired Protos in 1991 where this work continued and was applied to small molecule drug discovery, new biomaterials and nucleic acid delivery. Dr. Zuckermann was promoted to Research Fellow in 2003. In early 2006, he left Chiron

to join LBNL to do research at the interface of chemistry, biology and nanoscience. There he is expanding the application of sequence-defined peptoid polymers to mimic the structure and function of proteins, by folding peptoid chains into defined nanoarchitectures. He has published over 130 papers and is co-inventor on 38 patents.



The California Section, ACS, Election of Officers

Chair-elect - Margareta Sequin

Secretary - Michael Cheng

Director - Wally Yokoyama and Charlie Gluchowski

Member-at-Large - Linda Wraxall, Peter Olds, and Lee Latimer

Councilor – Bryan Balazs, Dan Calef, Don MacLean, Paul Vartanian, Xiaoxi Wei, Elaine Yamaguchi

The 2016 election will be conducted electronically via SurveyMonkey. You will be notified by SurveyMonkey via e-mail; please follow the link to candidate statements, voting instruction, as well as casting your votes. If you wish to cast your vote on a paper ballot, please call the California Section of ACS office at 510-391-9922, or by e-mail to office@calacs.org by 14 October, 2016, a paper ballot will be mailed to you. The candidate statements is also available at the www.calacs.org.

REPORT FROM THE ACS NATIONAL MEETING

Highlights from the Philadelphia Meeting

ACS hosted its 252th national meeting in Philadelphia, which has become one of the favorite locations for a National ACS meeting, with the expanding Convention Center right in the middle of the city, surrounded by hotels, restaurants, the adjacent Reading Terminal Market, and nearby historic sites. The city has an extensive and convenient transit system, including a direct train to and from the airport with a center city station connected to the Convention Center and the Marriott Hotel, which was the main governance hotel for this meeting. While there was still some evidence of signage, the city seemed none the worse for wear from the recent Democratic National Convention held there at the end of July. The weather was pretty hot and muggy at the start of the meeting and at the end, but a rain storm late Sunday afternoon ushered in some very pleasant weather early in the week. Fortunately, there did not appear to be any major weather issues and flight delays that plagued the start of last year's meeting in Boston.

As always, this was a very busy meeting for CALACS Councilors, Past Presidents, and our Director-At-Large – all of which are active in other ACS Governance and volunteer activities beyond that of representing CALACS at the Council meeting, as you will see documented later in this report.

The meeting highlight for CALACS came on Tuesday evening at the ChemLuminary Awards. CALACS was a finalist for two awards, and won both: Outstanding Project SEED Program and Most Creative NCW Celebration Using the Yearly Theme. For those CALACS members in attendance, it was especially gratifying to see Elaine Yamaguchi's excitement in hopping up on stage to accept the Project SEED award, considering all of the energy and dedication she has brought to that program over the years. Likewise, for Alex Madonik in accepting the NCW related award for CALACS and all of the work he puts into this effort and the many volunteers he has recruited and retained over the years.

Prior to the start of the ACS meeting, a Presidential Public Outreach event: "Exploring Our World through Chemistry", which has become a feature on the Saturday preceding National meetings, was held at the Franklin Institute, with over 600 people attending and 50 volunteers. Visitors received copies of the NCW 2016 edition of Celebrating Chemistry, with the theme, "Solving Mysteries Through Chemistry," and they explored nine tables of hands-on activities, many based on this theme. CAL-ACS Councilors Sheila Kanodia and Alex Madonik are on the organizing committee for these events (the Committee on Community Activities, which also brings you Chemists Celebrate Earth Day and National Chemistry Week).

The overall theme of the Philadelphia meeting was "Chemistry of the people, by the people, for the people." As usual a plenary session highlighted and introduced the overall theme, while Division programs related to the theme continued throughout the week. Multiple Presidential Symposia were held in addition to the Plenary session, including: "Chemical Sciences & Human Rights;" "Chemistry in the US & China: Current & Future States of Shared Scientific Interests & Opportunities for Cooperation;" "Fracking: Economics vs Environment;" "NSF Opportunities;" and "Broadening Participation in Global Chemistry Experiences: Why Engaging Diverse Chemistry Communities in Global Research is Critical. Two other special symposia were held: "Connectivity and the Global Reach of Chemistry: Honoring the Life and Scientific Contributions of Ernest L. Eliel;" and "Kavli Symposium on Chemical Neurotransmission – What Are We Thinking?"

The popular Kavli Foundation Lecture series continued on Monday afternoon, with the Emerging Leader lecture given by Dr. Omar Farha of Northwestern University on "Bioinspired Sponges: Metal-Organic Framework for Combating Nerve Agents and Toxic Gases" and the keynote Innovations in Chemistry lecture given by Dr. Chad Mirkin of Northwestern University entitled "Establishing a Genetic Code for Unnatural Materials."

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For the second ACS meeting, twelve young science trailblazers using chemistry to solve challenging global problems, dubbed by C&EN as the Talented 12, were the subject of a special symposium to present their work. The accomplishments of this group include: creating more efficient solar cells, untangling the mysteries of aging, probing foods for contaminants, and developing drugs to treat Alzheimer's and other diseases. One of them was Dr. Ke Xu of the University of California, Berkeley, who uses advanced microscopy to study cell structure and organization. Nominations are sought for 2017 Talented 12 through an on-line form.

Report from the Council Meeting and other Society governance activities

Seven of our eight CALACS Councilors, our two Past ACS Presidents, and our Director-At-Large were present at the Council meeting. Information on some of the activities to which they are affiliated can be found below. Alternate Councilor, Xiaoxi Wei, attended her first Council meeting in place of Councilor Stephanie Malone so that CALACS was represented at Council by a full contingent of voting members.

The Philadelphia Council meeting was a relatively quiet and efficient one. As usual for the fall National meeting, voting was held to select new members to the Council Policy Committee (CPC), the Committee on Committees (CONC), and the Committee on Nominations and Elections (N&E). The revised "Chemical Professionals Code of Conduct" was approved. The new edition of "Reagent Chemicals – Specifications and Procedures for Research Chemicals" was announced.

The ACS dues waiver for unemployed members was extended from two to three years by a unanimous voice vote.

A special discussion topic session was held to review and comment on the ACS President's task force on employment of chemists, for which CALACS member and ACS Past President, Attila Pavlath, is the Chair and ACS Past President, Marinda Wu, and CALACS Councilor, Bryan Balazs are members. Many serious comments were made and it was evident that this subject remains of concern to ACS members and officers.

Affiliations/comments from our Councilors, Past ACS Presidents, and Director-At-Large

News you might use

CAS announced the development of "New SciFinder." This is an entire overhaul of SciFinder, the pre-eminent search tool for chemistry. Initial promotional announcement will take place about early November with full roll-out in the Spring. Lee Latimer attended a demonstration and judged it to be a huge leap forward in display and functionality for all users.

Abstracts of the papers and posters presented at the meeting are archived at www.acs.org, and those plenary and symposium presentations that were recorded, with sequenced slides, can be found at www.acs.org/meetingcontent.

There was a theater presentation of Periodic Graphics - a collaborative effort between C&EN and Andy Brunning, chemistry educator and author of the popular graphics blog Compound Interest. It has provided graphics for educational purposes to students as well as educators. The UK Chemistry teacher's infographics takes a closer look at the chemical compounds we come across on a day-to day basis. His infographics makes the chemistry of foods, drinks, coins, dentistry, doping etc. more lucid. To see more of Brunning's work, go to <http://compoundchem.com> and <http://cen.acs.org/periodicgraphics.html>

On September 29th, the ACS Younger Chemists Committee in conjunction with the ACS Council Committee on Nominations and Elections will hold a virtual forum presenting the two nominees for President-Elect of the ACS for 2017. The YCC is also initiating the "Catalyze the Vote" campaign to encourage younger ACS members to vote in ACS National elections.

Interesting Statistics

There are now 3900 people who have joined the American Association of Chemistry

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Teachers (AACT) launched by the ACS in 2014, up from 2050 last year at this time, over 88% of whom are K-12 chemistry teachers.

Attendance at the Philadelphia meeting as of the Council meeting was 12,800, including 7437 regular attendees, 3249 students, and 613 expo only attendees. This was 1000 less than at the Boston meeting last year at this time and 3000 less than the San Diego meeting this spring.

The Committee on Economic and Professional Affairs (CEPA) reported that domestic unemployment for ACS members is down to 2.6% from 3.1% at this time last year, and the lowest it has been since 2008. The unemployment rate for new graduates remains high, over 12%. This data is all self-reported and represents a modest percentage of ACS members. For more information, see the reports in C&EN.

At the ACS Career Fair there were 710 job seekers, 37 employers offering 172 positions, and 17 recruitment booths in the Expo. As a new offering that began at the Spring meeting at the Career Fair, professional “headshots” were offered to registrants for use in on-line networking. In conjunction with these activities, as a benefit to members on site, Career workshops were held, along with 348 resume reviews and 179 mock interviews. CAL-ACS members, Mark Frishberg, and Bryan Balazs, and Marinda Wu, who are ACS Career Consultants, actively participated in these offerings.

There have now been 2082 students who have gone through the ACS Scholars program, 264 of which have gone on to complete a Ph.D. degree.

ACS membership had a slight decline from 2015 and now stands at 154,816, including 26,000 International members. The retention rate for US members is 84% and for International members it is 85%. Much of the variation is in the joining and dropping of Student members and those members in the first five years of their membership.

During the summer of 2016, ACS local section enrolled and supported 421 Project SEED students in over 120 laboratories, with 400 volunteer mentors.

Submitted by Mark Frishberg, CAL-ACS Councilor, with input from our other Councilors, Past ACS Presidents and our Director-At-Large – September 17, 2016

Ed note: a complete report is listed on the website, www.calacs.org



Presidential Series of ACS Symposium Books

Marinda Li Wu, 2013 ACS President

At the recent 252nd national ACS meeting in Philadelphia in August, it was exciting to have two more book signings conducted by ACS Symposium Books staff for my third ACS Symposium book series 1195 on “Jobs, Collaborations, and Women Leaders of the Global Chemistry Enterprise.” which also includes a report on the “Supply and Demand of Chemists in the U.S.” along with 14 chapters pertaining to international collaborations and global mobility. Thanks go to my co-editors Dr. H.N. Cheng and Dr. Bradley Miller as well as the many authors of this 33 chapter third ACS Symposium Book.

This third book from the Presidential Series of ACS Symposium books based on my presidential initiatives is now available in hard copy from Oxford University Press. ACS members are eligible for a 40% discount off the list price. When members go to the OUP Symposium Series website ([link here](#)), they need to enter the promo code ACSOFFER at checkout to receive the discount.

The book is currently listed as \$175.00 on OUP’s website. With the discount, the total should be around \$105.00. It is also available from Amazon but without the ACS member discount. However, all ACS members can order up to 25 book chapters at no cost each year on line at www.acs.pubs.org under ACS Symposium eBooks.

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OCTOBER

- Membership needs and benefits
- Career outlook and jobs
- Industry-academic partnerships
- Recognition for chemists




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