

THE VORTEX

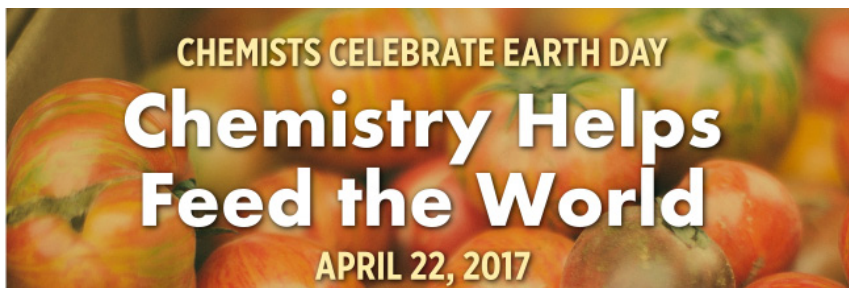
AMERICAN CHEMICAL SOCIETY
VOLUME LXXIX NUMBER 4

CALIFORNIA SECTION
APRIL 2017



Charles Gluckowski conducting experiments
for “Expanding Your Horizons” See Page 9

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*Celebrate Earth Day with the ACS
"Chemistry Helps Feed the World"*

Earth Day

The California Section returns to the John Muir National Historic Site in Martinez, CA, for this year's celebration of Earth Day (and John Muir's birthday) on Saturday, April 22nd, 2017, 10 AM to 4 PM. We will join dozens of other community groups to share ideas, souvenirs, and hands-on activities with hundreds of visitors. At the Cal ACS booth location, demonstrations and hands-on activities will relate to the ACS Earth Day 2017 theme, "Chemistry Helps Feed the World." We will have copies of Celebrating Chemistry (in English and Spanish) with activities that families can try at home, as well as Periodic Table wallet cards, UV-Detection cards and other cool souvenirs.

John Muir National Historic Site, 4202 Alhambra Ave., Martinez, CA 94553
<<https://www.nps.gov/jomu/index.htm>>

Sheila Kanodia and Alex Madonik

Family Science Night

We are off to an early start with public outreach in the California Section this spring and you can help!

Family Science Night returned to Helms Middle School in San Pablo, CA on Thursday, March 9th, 6 PM to 8 PM. The Scientific Jam band and Bryan Balazs were there to open the show with music and some thrilling chemical demonstrations.

Volunteers Needed

Whether you're an experience outreach volunteer, or curious to see one of these events for the first time, you can join the fun and also share your love of chemistry with the public.

We are looking for volunteers for the April 22nd event. Preferred shifts are from 10-1 PM and 1-4 PM. Please contact sushila.kanodia@gmail.com or office@calacs.org

THE VORTEX

Published monthly except July & August by the California Section, American Chemical Society. Opinions expressed by the editors or contributors to THE VORTEX do not necessarily reflect the official position of the Section. The publisher reserves the right to reject copy submitted. Subscription included in \$15 annual dues payment. Nonmember subscription \$15.

MAGAZINE OF THE CALIFORNIA SECTION, AMERICAN CHEMICAL SOCIETY

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PRINTER:

Quantity Postcards
255 4th Street #101 Oakland CA 94607 510-268-9933
Printed in USA on recycled paper

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Chair's Message

One of the services that the ACS provides,



and one with significant contributions from California Section members, is Career Services (<https://www.acs.org/content/acs/en/careers/career-services.html>). Although the unemployment rate among chemists is only

about 3%, that is double what it was back in the 1980s and 90s. (Note, this is the ACS's "seeking employment" rate, not the U.S. Department of Labor's unemployment rate.) Prominent contributors from our Section to the efforts of the ACS include past presidents Attila Pavlath and Marinda Wu, Linda Wraxall, Director Lee Latimer, and Councilors Bryan Balazs and Mark Frishberg. You can watch a brief profile video of Mark's career at What Chemists Do.

The ACS National Meeting is a great place to witness (or take advantage of) the ACS's resources for employment assistance. There you will find Professional Education courses, sessions on résumé writing, presentations

on interview strategies, and personal career counselling. You will likely meet Mark, Lee or Bryan in this setting.

If you have not yet graduated or are just considering a change, the ACS's resources will also be useful to you, including explorations of internships or pathways into the various employment sectors (industry, government, academia, and self-employment/consulting). A central activity of the National Meeting is the ACS Career Fair. There members can take advantage of the above services as well as apply for and interview for available jobs.

Informing the entire job-hunting process are the excellent ACS resources that report on the employment of chemists and their salaries. The studies include breakdowns by degree-held, geography, age, experience, gender and other demographic issues as well as job sector considerations.

As usual, I encourage you to consider all of these offerings as possible areas for your personal involvement in the ACS and your local section, especially if you have benefitted from these services in the past. I would be happy to connect you with those from the California Section who could help guide you to a satisfying context for your contributions.



ACS Poetry Contest

The California Section of the American Chemical Society (ACS) is sponsoring an illustrated poem contest for students in Kindergarten through 12th grade.

Contest Deadline: 14th April 2017

Prizes: Gift certificate for Andy Brunning's book or other such books

Contact: sushila.kanodia@gmail.com or office@calacs.org

Winners of the California Local Section's Illustrated Poem Contest will advance to the ACS National Illustrated Poem Contest for a chance to be featured on the ACS website and to win prizes!

Write and illustrate a poem using the CCED theme, "Chemistry Helps Feed the World." Your poem must be no more than 40 words and in the following styles to be considered:

HAIKU - LIMERICK - ODE - ABC POEM - FREE VERSE - END RHYME
- BLANK VERSE

CCED themes: Crops, Starch, Sugars, Protein, Fertilizer, Carbohydrate,

CONTEST RULES:

POEMS MUST CONFORM TO A PARTICULAR STYLE. NO POEM MAY BE LONGER THAN 40 WORDS.

THE TOPIC OF THE POEM AND THE ILLUSTRATION MUST BE RELATED TO THE CCED 2017 THEME.

ALL ENTRIES MUST BE ORIGINAL WORKS WITHOUT AID FROM OTHERS.

EACH POEM MUST BE SUBMITTED AND ILLUSTRATED ON AN UNLINED SHEET OF PAPER (OF ANY TYPE) NOT LARGER THAN 11" X 14". THE ILLUSTRATION MUST BE CREATED BY HAND USING CRAYONS, WATERCOLORS, OTHER TYPES OF PAINT, COLORED PENCILS, OR MARKERS. THE TEXT OF THE POEM SHOULD BE EASY TO READ AND MAY BE PRINTED WITH A COMPUTER BEFORE THE HAND-DRAWN ILLUSTRATION IS ADDED, OR THE POEM MAY BE WRITTEN ON LINED PAPER WHICH IS CUT OUT AND PASTED ONTO THE UNLINED PAPER WITH THE ILLUSTRATION.

ONLY ONE ENTRY PER STUDENT WILL BE ACCEPTED.

ALL ENTRIES MUST INCLUDE AN ENTRY FORM.

ALL ILLUSTRATED POEMS AND/OR DIGITAL REPRESENTATIONS OF THE POEMS BECOME THE PROPERTY OF THE AMERICAN CHEMICAL SOCIETY. ACCEPTANCE OF PRIZES CONSTITUTES CONSENT TO USE WINNERS' NAMES, LIKENESSES, AND ENTRIES FOR EDITORIAL, ADVERTISING, AND PUBLICITY PURPOSES.

ENTRY FORM

Student and Organization Information

Student's Name:

Grade:

Parent/Guardian:

Parent/Guardian Email:

School or sponsoring group:

(e.g. Boys and Girls Club or Scout

Troop, 4-H, etc.)

Teacher's Name:

Teacher's Email:

School Address:

Address Line 2:

City:

State:

Zip:

Judging Category by Grade (Check one)

K-2

3-5

6-8

9-12

Please fill out this form, print, and attach to the back of the poem. All fields are required. Incomplete forms will invalidate the entry; The Deadline for the contest is 14 April 2017. Mail to CalACS San Leandro CA. The entry form is also on the website, www.calaacs.org under the tab >Events & Programs>earthday

California Section April Meeting

Speaker: Dr. Attila E. Pavlath

Talk: How Chemistry May Extend Meaningful Lifespan

When: Thursday, April 20, 2017;

Time: 6-6:50pm social time talk 7-8 pm

Where: USDA, 800 Buchanan St. Albany

Cost: \$10.00, \$5.00 for students



Abstract:

Life is a complex biochemical process, composed of multiple chemical reactions. The components may be regenerated by the human body itself and/or by incorporation

of various additives, both natural and synthetic. The parts of the reactor i.e. various components of the human body may be kept from wearing out in a similar way as an automobile through additives, repairs and parts replacement. Chemistry is the major factor in extending lifespan in all cases. The lecture will show the role of chemistry for a longer life and look into future possible developments. The essence of the talk is what chemistry has done and is capable to do more in the future, not how. One does not have to know chemistry to understand the talk.

Biography:

Attila Pavlath is a Senior Emeritus Research Chemist since 1967 at the Western Regional

Research Center of the U.S. Department of Agriculture in Albany, California, conducting research on the utilization of agricultural products as chemical resources. In 1955 he received his doctoral degree in chemistry from the Hungarian Academy of Sciences. He was an Assistant Professor at the Technical University of Budapest. After leaving Hungary in 1956, he was first at McGill University in Montreal, Canada until 1958, when he went to Stauffer Chemical Company in Richmond, California as a Senior Group Leader before joining USDA in 1967.

His research activities since 1951 earned him international recognition as an expert in a wide variety of scientific areas. He has been involved in Fluorine chemistry, Glow discharge chemistry, Textile chemistry, Energy research and Agricultural chemistry. He is an internationally known expert in these fields with more than 130 scientific publications, 25 patents and 4 books. He has lectured throughout the world and speaks four languages. He is a member of the Hungarian Academy of Sciences and was elected as ACS President in 2000.



Immigration Questions/Issues?

Attend the ACS National Meeting in San Francisco where Immigration Lawyers will be offering free consultations within the Career Fair area from April 2-4, 2017. Register on-line at www.acs.org.

Attention Students and other Jobseekers:

Attend the Career Fair at the upcoming ACS National Meeting in San Francisco, April 2-4, 2017. Sign-up for resume reviews, mock interviews, and career oriented workshops, and do not miss your chance to interview with employers seeking new hires. Remember, it usually takes 9-12 months or more to secure a position in industry, academe, or government, so do not delay taking the next step in your chemistry career. Register for the meeting on-line at www.acs.org and sign up for workshops and the Career Fair. For further questions, do not hesitate to contact the CALACS Career Assistance Committee via office@calacs.org.



Salty Solutions (Part 4) by Bill Motzer

In Part 3 of Salty Solutions (*The Vortex*, November 2016), I noted that the Sodium Adsorption Ratio (SAR) could be used in evaluating irrigation water's impact on agricultural soil. However, because elevated sodium also occurs in some irrigation water, there's a tendency for it to cause soil particle dispersion thereby impairing the soil's permeability. This is somewhat counteracted by high overall salinities, and because of this

effect, one must also consider irrigation water's total salinity when assessing its potential sodium hazard. To do this, we can compare and evaluate two parameters at once: the irrigation waters' calculated with its electrical conductivity (EC_w). Figure 1 (below) has been used by many authors to provide a useful guideline for assessing irrigation water and in determining what level of reduction in soil permeability, if any, is likely to occur.

The diagram was calculated using the following factors:

For the x axis:

Class	Salinity Water Hazard	EC_w ($\mu S/cm$)
C1	Low	<250
C2	Medium	250-750
C3	High	750-2,250
C4	Very High	>2,250

For the y axis:

Class	Sodium Hazard*	Dividing Line Equation*
S1	Low	
		$S = 43.85 - 8.87 \log C$
S2	Medium	
		$S = 31.31 - 6.66 \log C$
S3	High	
		$S = 18.87 - 4.44 \log C$
S4	Very High	

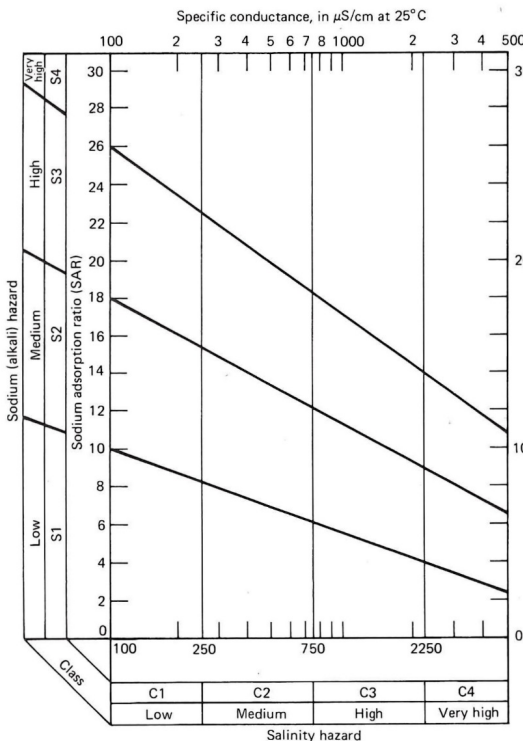
* Sodium Hazard is a function of both SAR and salinity

** Where S = SAR and C = EC_w . Source: Water Quality Data (Hounslow, 1995 ISBN 0-87371-676-0).

(continued on page 7)

(Motzer continued from page 6)

For example, if the ECw is measured at 1,000 $\mu\text{S}/\text{cm}$, the water will have a high salinity hazard (C3). If the water also has a calculated SAR of 22, it will have a high sodium hazard (S3). In a future article, I'll discuss leaching as a function of permeability and its effects on groundwater.



MARCH FOR SCIENCE

The American Chemical Society (ACS) in Washington, D.C., announced its support for The March For Science, “predicated on two essential conditions.” One stipulation by the 157,000-member society is that the march must “adhere strictly to its established and publicly posted mission and principles.” The other is that the event must “be a nonpartisan celebration of science.” The ACS conditions reflect concerns expressed by some experts that such a large, grassroots movement will struggle to stay on message.

Hayward : April 22, 10am-12, noon Park along Breakwater Avenue or in the lots at Breakwater & Whitesell (limited shuttle service for those who need it)
<http://www.haywardbooktoaction.org/act.html>

San Francisco April 22, Justin Herman Plaza, 11:00AM End: Civic Center Plaza
 A rally with invited speakers will start the event at 11:00AM in Justin Herman Plaza. After the rally at approximately 12:30PM, we will march down Market Street to Civic Center Plaza, ending with a Fair to celebrate science. <https://marchforsciencesf.com/>

Co-sponsored by
Lafayette Library and Learning Center Foundation
and the California Section, American Chemical Society

EARTHQUAKE EARLY WARNING SYSTEM

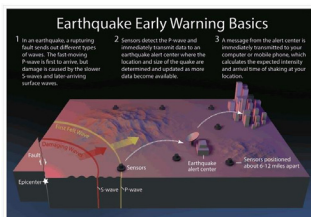
What does it take to build an Earthquake Early Warning system (EEW)?

April 5, 2017 7:00PM Community Hall



Guest Speaker:

Robert De Groot, U.S. Geological
Survey Earthquake Science Center,
and ACS Fellow.



Robert de Groot discusses the development of **ShakeAlert** an EEW system for the West Coast of the United States. EEW systems can provide crucial warning to people and important automated systems before strong shaking arrives. Learn how **ShakeAlert** works and how it will enhance earthquake preparation, response and recover.

Discover how libraries can play an important role in **The Quake Catcher Network** – a “**citizen science**” project developed to gather earthquake data.

Tickets: \$10 Students FREE

Purchase tickets at: Tinyurl.com/LLCQuake

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Proceeds benefit the Lafayette Library and Learning Center.

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Save The Dates

253rd American Chemical Society
National Meeting & Exposition

San Francisco, California
April 2-6, 2017

Awards Luncheon

Sat, May 6, noon-3:30 pm
Scotts Seafood Restaurant,
Walnut Creek.

*Expanding Your Horizons -
Math and Science for Girls, in
San Ramon, Feb. 25, 2017*

A dedicated team of members of our Women Chemists Committee and Executive Committee presented hands-on activities at the Career Fair of this year's "Expanding Your Horizons - Math and Science for Girls" event at Diablo Valley College in San Ramon. Within a two-hour period, more than one hundred and twenty girls, ages 12 – 14, filed by our tables and tried their hands at guessing plants scents, built molecules with molecule kits of some of the scents, and tested for

starch in various food items – as well as in counterfeit money. The students were asked to cast their votes for their favorite and least favorite scents, respectively, by marking lines on a board. Vinegar was clearly the winner among the least favorites, whereas almond extract, mint, and citrus were pretty evenly chosen as favorites. Collecting the students' votes conveniently provided us with an approximate count of our visitors. Our team of seven busy volunteers made it possible to engage the large number of students to try out the experiments during the limited time assigned for the career fair. The girls performed our hands-on activities with great enthusiasm, and it is our hope that our CalACS activities further stimulated the students to continue their pursuit of science.

Greti Sequin



A NOBEL EVENING WITH THE YCC

By Alex Klevay

Last February, the Younger Chemist Committee reconvened in San Francisco at Bird & Beckett Books & Records. The quaint and intimate venue featured both new and familiar faces who gathered to hear Stanford Professor W.E. Moerner, recipient of the 2014 Nobel Prize in Chemistry.

As the father of single-molecule spectroscopy, he developed invaluable techniques which brought the ultimate limit of microscopy to single molecule resolution, far beyond the diffraction limit of light itself. The key to Professor Moerner's Nobel prize winning feat in 1989 lay in his ability to individually excite the single tell-tale fluorescent pentacene molecules in his supercooled crystal samples, causing them to shed light on their surroundings.

With an ever expanding toolkit, Moerner imaged biophysical subjects with clarity

like never before by selectively placing remotely-activated fluorescent molecular beacons within cellular components such as plasma membranes and microtubules. A single, tagged kinesin protein motoring along one of these microtubules could be resolved, and by superimposing the signals of select kinesins, the entire network of the cell could be illuminated, and in 3D. In 1997, while working at UCSD, Moerner suggested the possibility of using GFPs as fluorescent markers for time-dependent cell processes in the first room-temperature single-molecule spectroscopy example of controlled photoswitching.

He praised the special atmosphere at the IBM Almaden Research Center where deep industry research set the stage for his prize-winning work. Replying to a question about about how he celebrated once his wife relayed news of the victory, Moerner said there were lots of parties amongst the labs he had worked, including his current group at Stanford.

Prof. Moerner quipped that the next best thing to winning a Nobel prize is being featured on the animated TV show *The Simpsons*, whose writers predicted his win along with many other soon-to-be-named recipients during a Nobel prize betting pool joke.

In an apt anthropomorphization of Moerner's spectroscopic quest, the back of his medal depicts a genius of science unveiling the visage of the cornucopia-bearing goddess of nature.



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There are many companies and organizations searching for chemical and biochemical personnel to fill important jobs in their organizations.

- Companies for laboratory and management positions
- Universities & Colleges for teaching positions and laboratory personnel
- Hospitals for technical and research personnel

There are several web sites that may help you search for these open positions.

- www.mboservices.net
- <http://www.calacs.org/page.asp?id=22>

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