

THE VORTEX

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CALIFORNIA SECTION
SEPTEMBER 2014

**California Section -- ChemLuminary Award
Winner for Outstanding Performance by a
Local Section (Very Large Size) for 2013!**



Marinda Wu. (ACS Past President) and Martin Rudd (LSAC Chair) presents
The ChemLuminary Award for Outstanding Performance by a Local Section to Mark
Frishberg (Chair 2014) and
Wally Yokoyama (Chair 2013)

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Chair's Message

Mark Frishberg

This month's message is a recap and a look ahead.

The recap relates to the recent ACS National Meeting in mid-August

in San Francisco.

The look ahead is an invitation to review the many upcoming Cal-ACS events this fall, and try to participate where you are able. Chair-Elect and Program Chair, Charlie Gluchowski, has put together an excellent combination of local section speakers including a September meeting in the North Bay where we have not had a meeting for several years. Plans for multiple events around the section are in the works for National Chemistry Week, Oct. 19-25.

With the beginning of the new school year, this is also a request of faculty to encourage your students to become student members of the ACS, so they can be exposed to and partake of the many career development opportunities available through the ACS, locally and nationally. This includes career consultant connections that can assist with resume reviews, mock interviews, and career planning. This is especially critical for college seniors and grad students and post docs who are within a year or so of graduation, and who need to be starting now to network, connect with potential

employers, and plan for the next step in their careers.

This was truly a special National ACS meeting for CAL-ACS. You will read elsewhere about our success in winning the Outstanding Performance by a Local Section (very large size), and similar recognition for the Western Regional ACS meeting last October, that was co-sponsored with the Santa Clara Valley Local Section. When you see them, make sure to congratulate Wally Yokoyama, our immediate Past Chair, during whose term these accomplishments were achieved, and Lee Latimer, who was our lead on the WRM organization committee.

It was a challenge to attend all of the CAL-ACS related events at the ACS meeting. We started with the Public Outreach Event on Saturday before the official start of the meeting. While the National ACS group and Committee on Community Affairs members and volunteers staffed the demo tables on the first floor of the Children's Creativity Museum, CAL-ACS members operated four demo tables on the rooftop. The chilly, windy, overcast day seemed to limit attendance, but it did not dampen the enthusiasm of those who did attend, nor Alex Madonik, Greti Sequin, Margaret Elliott, Paul Vartanian, and me who ran our rooftop demos.

Everyone who visited our Hospitality Booth, or viewed the extensive number of our commemorative and informative

(continued on page 8)

September 2014 - Cal-ACS Section Meeting

Date: September 25, 2014

Speaker: Dr. Lisa Ellerby, Associate Professor, Buck Institute

Title: Chemical Approaches to Huntington's Disease

Time: 5:30 – 6:30 PM Social, 6:30 – 7:30 PM, Presentation

Location: The Buck Institute for Research on Aging, 8001 Redwood Blvd, Novato, CA

Cost: \$10 per person

Reservations: Please contact the California Section, ACS office at office@calacs.org or call 510-351-9922.

Biography:

Dr. Ellerby is an expert on cell death in neurodegenerative disorders such as Huntington's Disease (HD), a progressive inherited disorder that attacks both motor coordination and thinking ability. Dr. Ellerby recently discovered a new lead to potential drug therapies for HD by focusing on a mysterious protein linked to the illness, the huntingtin protein (Htt). Huntington's disease stems from a gene mutation that produces an abnormal form of the huntingtin protein, which breaks down into toxic fragments. These fragments accumulate in neurons, which malfunction and eventually die. Dr. Ellerby and her team identified a set of enzymes that help split up Htt into fragments, and whose activity contribute to nerve toxicity. In a novel discovery, the lab found this harmful activity in a class of enzymes already implicated in stroke, cancer, and other disorders. Drug researchers have

now developed experimental compounds to inhibit these enzymes, called the matrix metalloproteinases (MMPs). Dr. Ellerby's work suggests that inhibiting the MMPs may lessen symptoms of HD and prevent nerve cell death. The Ellerby lab is also exploring possible methods to use induced pluripotent cells to model HD and use this HD model for target identification and stem cell therapies. Dr. Ellerby received her PhD in Chemistry from the University of California, Santa Cruz. She took postdoctoral training in the Department of Biochemistry and Chemistry at the University of California, Los Angeles. She was a Senior Research Associate in Neurodegenerative Disease and Apoptosis and a Co-Investigator with the Program on Aging at the Burnham Institute in La Jolla, CA before she joined the Buck Institute in 2000.

UPCOMING FALL 2014 CALIFORNIA SECTION EVENT SCHEDULE

September 14, 2014: Solano Avenue Stroll, Time: 10:00 am to 6:00 pm

October 11, 2014: Women Chemist Committee Fall Event, "The Genetics of Flower Formation", Speaker-Jennifer Fletcher Cost: \$15.00 Luncheon, Time: 10:00 am to 2:00 pm
Location: the USDA, 800 Buchanan St. Albany, CA

October 21, 2014: Section Meeting, Carl Djerassi's play "Insufficiency" followed by a discussion on Chemistry and the Arts. Location: Z-Space Theater, 450 Florida Street, SF. Cost and Time TBA

October 22, 2014: Family Science Night, Helms Middle School in San Pablo. For more information contact Alex Madonik at alexmadonik@sonic.net

November 1, 2014: Bay Area Science Festival at AT&T Park, Time: 11:00 am to 4:00 pm
For more details go to <http://www.bayareascience.org/>

November 18, 2014: Section Meeting, "Adventures of a Forensic Scientist", Speaker, Sandra Sachs, PhD, Oakland Police Dept. Criminalistics Laboratory, Time: 5:30 pm–6:30 pm Social, 6:30 pm –7:30 pm Presentation, Cost/Location: TBA

FOR RESERVATIONS- please contact the California Section, ACS office at office@calacs.org or by phone (510) 351-9922.



Toxic Terra (Part 1)

Bill Motzer

As chemists we know that there are thousands of poisonous manufactured chemicals—but what about those occurring naturally in the environment? I

enjoy hiking in our beautiful Bay Area hills – from Mt. Tamalpais in Marin County to the East Bay hills and Mt. Diablo in Contra Costa County to Almaden Quicksilver Park in Santa Clara County (see February 2014 Vortex: Methylating Mercury-Revisited). Unfortunately, all of these areas contain abundant poison oak to which I'm now becoming increasingly allergic because of the oils secreted by these plants. The last exposure caused a rather nasty rash, which got me thinking about those other naturally-occurring toxins. Several years ago I attended a conference on naturally-occurring hazardous substances (NOHS). Topics included naturally-occurring arsenic, radon, asbestos, and other substances contained in rocks, soils, and groundwater that could affect and potentially harm humans. This series of articles will focus on such NOHS; however, the topic is so extensive that only a few examples will be discussed. But first some definitions:

A poison is a substance/chemical capable of causing illness or death of a living organism when introduced or absorbed. It is generally considered to be a manufactured or synthetic substance or chemical.

A toxin is an antigenic poison or venom produced by a plant or animal, especially one produced by or derived from microorganisms causing disease when present at low concentrations in the body. It is generally considered to be of natural origin. The term was first used by organic chemist Ludwig Brieger (1849–1919). In most literature, poison and toxin are used as synonyms and considered as absolutes.

The best definition of a poison was given by Philippus Aureolus Theophrastus Bombastus von Hohenheim, (1493 to 1541), a Swiss-German Renaissance physician (aka Paracelsus), who founded the science of toxicology and is credited with stating

that: “All substances are poisons; there is none which is not a poison. The right dose differentiates a poison and a remedy.”

Essentially, in humans there are four routes of exposure for toxic substances/poisons:

1. Inhalation: the breathing in of airborne fumes, mists, dust, gases, or particulate matter.
2. Absorption by direct contact of a substance through the skin, eyes or mucous membranes.
3. Ingestion: the eating or drinking of hazardous substances.
4. Injection: materials that pass or penetrate through the skin via wounds or openings in skin, or are propelled through by air or another source.

Once toxic substances/poisons enter the human body, two major effects may occur:

1. Local health effects are those occurring at the point of contact with the hazardous substance. An example is poison oak, where plant contact with the skin produces a rash.
2. Systemic health effects which are not as apparent as local health effects because they can occur anywhere within the body, particularly when a body system or organ is the exposure target. NOHS penetrating skin, those inhaled or ingested, can enter the blood stream. Toxins are then distributed throughout the body and travel to specifically targeted organs exerting harmful effects. An example is the dizziness or confusion cause by breathing vapors that affect the brain, or by breathing low levels of oxygen.

There are at least three time frames for chemical exposure:

1. Immediate exposure causes instantaneous effects. Examples are smoke inhalation and in particular exposure to carbon monoxide (CO) which is colorless and odorless, with no warning properties. A CO concentration of 1,200 parts per million by volume (ppm_v), will kill a person quickly without warning, generally within minutes. Although immediate effects may be dangerous, in general humans tend to react quickly to such dangers removing themselves from such environments.
2. Delayed exposure occurs within hours or days following exposure. An example is ingestion of excessive quantities of alcohol; the resulting “hangover” is considered a

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(Motzer continued from page 5)

delayed effect. However, this exposure type may constitute a more dangerous situation because at the time of the exposure, we may not realize that we are being exposed to a hazardous/toxic substance and thereby we may keep exposing ourselves until it is too late.

3. Long-term exposure generally occurs months to years after exposure from toxic materials such as asbestos. Long-term health effects include cancer, organ damage, and reproductive harm. Again the problem with this type of exposure is that organ damage may be extensive and unrealized until symptoms appear.

A possible simplified classification of NOHS follows:

Geological Sources/Impacts

Terrestrial

- Rocks and Soils (e.g. mineral dusts)
- Surface and Groundwater
- Radiogenic substances (e.g.: U, Ra, and Rn)

Atmospheric: e.g. volcanic gas emissions, forest fires

Oceanic

Biological Sources/Impacts

- Bacteria, viruses, and prions, Fungi
- Plants (e.g. phytotoxins) and Animals
- (e.g. venomous)

Extraterrestrial Sources/Impacts

Asteroid/Comet Impacts: e.g., dust and gases

Radiation: e.g. cosmic rays

In Part 2, I'll discuss these topics in more detail.



Toxicodendron diversilobum, commonly named Pacific Poison Oak or Western Poison Oak. Photo taken by W.E. Motzer on July 13, 2014, in Purisima Creek Redwoods Open Space Preserve, San Mateo County, CA.

Science Cafe

The Art and Science of Cheese

Tuesday, September 16 at 7PM

Lafayette Library & Learning Center Community Hall. Join us for our first Science Café of the season as we explore the art and science of cheese. Learn how bacteria, enzymes and acids transform ordinary milk into over 1000 varieties of CHEESE – creating the quintessential convenience food! We will uncover the mystery of why cheese can be stored for months or even YEARS; and finally answer the question – what are curds and whey? The evening will include cheese sampling.

Boxed meals will be available for pre-order. For more information and to register go to LLLCF.org Lafayette Library And Learning Center Foundation 3491 Mt. Diablo Blvd. Lafayette, CA 94549

California Section Recognized with the Outstanding Performance
by a Local Section (Very Large Size) ChemLuminary Award for 2013!

ACS recognizes the contributions by volunteers in local sections and divisions to their communities, regions and chemical specialties through the ChemLuminary Award Ceremony. At the ACS National Meeting in San Francisco, the 16th Annual ChemLuminary Award Ceremony was held at the Palace Hotel Grand Ballroom. The California Section was a finalist among the 185 local sections for 7 awards: Best Chem Club NCW Event, Best Activity or Program Stimulating Member Involvement, Local Section Partnership Award, Outstanding Collaboration Between a Local Section and Division, Outstanding Project SEED Program Award, Outstanding Program Aimed at Retaining Women in the Chemical Enterprise, and Outstanding Performance by a Local Section. The whole evening was a nailbiter because the Section was a finalist for so many awards. At the very end of the evening the California Section was recognized with the Outstanding Performance by a Local Section (Very Large Size) award for 2013! This award reflects the many activities at local schools and science fairs, seminars for members, seniors, women and young chemists, and the development and production of regional meetings. The Western Regional Meeting 2013 was also recognized as the Outstanding Regional Meeting of 2013! This meeting was co-hosted by the California and Santa Clara Valley Sections and held in Santa Clara last October. There were well over a hundred volunteers from the two

local sections to execute this hugely successful event, led by Lee Latimer for CalACS and Natalie McClure for SCVACS, General Co-Chairs, and Bonnie Charpentier (SCVACS) and Janet Gunzner-Toste (SCVACS). Program Co-Chairs. In addition to the ChemLuminary event three Section members, Alex Madonik, T. Don Tilley and Paul Vartanian were recognized as ACS Fellows for their professional accomplishments and volunteer service to



chemistry.

Elaine Yamaguchi (right in the photo) was recognized by ACS Executive Director Madeleine Jacobs (left in the photo) for her over 30 years of leadership of Project SEED in the California Section and in service

on the national Project SEED committee! Congratulations to all the volunteers who made 2013 a great year for the California Section!



Will Lynch (Chair of M&E, the sponsor of the award), Natalie McClure, Janet Gunzner-Toste, Lee Latimer, Bonnie Charpentier, Ean Warren and Marinda Wu. The head in front is Peter Cutts, photographer for most ACS events.

(Chair Continued from page 3)

posters nearby, in the Town Hall area of the Exhibition, or in the hallway of the ballroom level in the Hilton hotel can thank the major efforts of our general meeting coordinator, Lee Latimer, his primary assistant, Charlie Gluchowski, and Attila Pavlath, plus the numerous volunteers that helped staff the Hospitality Booth that we shared jointly with the Santa Clara Valley local section. Thanks for all your work – you pulled it off!! Now let's build on this for the next ACS National meeting in San Francisco in the spring of 2017.

Personally, this was a meeting to enjoy some special moments brought to us by special people. The Division of History of Chemistry (HIST) held a half-day symposium honoring the career and accomplishments of our very own, ACS Past President, and three-time CAL-ACS Chair, Attila Pavlath. Paul Vartanian's extensive historical accounting of Attila's career and connection with CAL-ACS was a tour-de-force, and a tribute to the energy of purpose that Attila has brought to the ACS throughout his long career. This symposium was recorded, so look for it when the recordings from this meeting are released on-line in a few weeks. I also was moved by the reminiscences by Priestly Award winner and CAL-ACS member, Darlene Hoffmann,

at the Women Leaders symposium organized by ACS Immediate Past Chair Marinda Wu, and by Jeanne Pimentel as she reminded us of the many accomplishments of past ACS President George Pimentel (not the least of which was National Chemistry Day, which became National Chemistry Week) who was taken from us much too soon in 1989. Jeanne's remarks were made both at the Division of Chemical Education reception on Sunday evening, and at the Chemical Ambassadors five year anniversary reception Tuesday evening.

I have had the privilege to attend all but four ACS National meetings since my first one in the spring of 1977. In many ways these are overwhelming meetings, and my appreciation of them has evolved significantly over the years. In the beginning, my approach to these meetings was all about the science. Over the years, however, I have come to realize that it is really all about the people. That is why I appreciate both the history lessons and personalities of the presentations mentioned above, and the need to connect and mentor our up and coming younger members, which I do with my participation as an ACS Career Consultant and Workshop Presenter at the ACS Career Fair. The August 2014 meeting was special in many ways. I hope that it was also special

Heino Nitsche July 24 1949-July 15, 2014,



UC Berkeley Chemistry Professor Heino Nitsche died unexpectedly in his sleep at his home in Oakland early in the morning, Tuesday, July 15. He was 64 years old. Nitsche was born July 24, 1949, in Munich, Germany.

In September 1980, Nitsche arrived at Lawrence Berkeley National Laboratory for a one-year staff scientist appointment. Nitsche's stay at LBNL lasted much longer than he expected. By 1984 he was a lab investigator with his own research group. Nitsche's early research focused on the environmental chemistry of actinides but later grew to include the search for new heavy elements.

In 1993, Nitsche and his wife, Martha Boccalini left Berkeley and moved to Germany, where Nitsche had a new appointment as the head of Forschungszentrum Dresden-Rossendorf (Dresden-Rossendorf Research Center).

In 1998 he was lured back to Berkeley by an offer to become a full professor in the Department of Chemistry, a senior research scientist at LBNL and the founding director of LBNL's new Glenn T. Seaborg Center.

Nitsche is survived by his wife, Martha Boccalini; his older brother Gero, a retired food industry chemist in Munich; Gero's two married sons; and several grand-nieces and grand-nephews. The college will provide information about any plans for a memorial service when it becomes available.

CalACS Poster Session at the 2014 ACS Fall Meeting in San Francisco



Linda Wrxall, Julie Mason, Alex Madonik, Mark Frishberg, Elaine Yamaguchi and Lee Latimer

Western Regional Meeting Poster Session at the 2014 ACS Fall Meeting in San Francisco



Lee Latimer, Natalie McClure, Jim McClure, Janet Gunzner-Ioste, Bonnie Charpentier, and Ean Warren

California Section Outreach Events – Fall 2014

The California Section has just won the ACS ChemLuminary Award for the Outstanding Local Section in 2013, but we're not resting on our laurels. We have a busy schedule of public outreach events planned for the remainder of 2014, with great opportunities to interact with kids and adults of all ages. You can help us show the public that science is fun, and that it's also essential for every aspect of our lives.

At each of the following events, we will display posters and provide information about science education and the role of chemistry in our world. Plus, we will invite visitors to try hands-on activities that show chemistry in action, using plants and safe household materials.

1) Solano Stroll on Sunday, September 14th – join us at our booth on Solano Avenue in Berkeley. We're expecting thousands of visitors. Volunteers are needed for two-hour shifts between 10 AM and 6 PM.

2) Our National Chemistry Week celebration kicks off with an event for the Fairfield Girl Scouts on Sunday October 19th, 1 PM to 4 PM. This year's NCW theme is "Candy, the Sweeter Side of Chemistry," and we hope to arrange presentations by scientists from Jelly Belly. Please contact Janet Schunk if you can participate that day: <schunkjm@mindspring.com>

3) National Chemistry Week continues with Family Science Night at Helms Middle School in San Pablo, on Wednesday October 22nd, 6:30 PM to 8:30 PM. The Scientific Jam Band will provide live music, Bryan Balazs will return with an exciting chemistry show, and you can help us present over a dozen hands-on activities. We first visited the Helms campus three years ago when it was brand new, and we're happy to return to this school, which serves a large community of minorities that are underrepresented in STEM fields. Their science staff is eager to change that situation for their students.

4) Last, but not least, we will return to the Bay Area Science Festival's Discovery Days at AT&T Park on Saturday November 1st, 11 AM to 4 PM. Over 100 Bay Area companies and organizations participate in this FREE event, which attracted well over 20,000 visitors last year. Bring your family, and please sign up for a morning or afternoon shift at our booth.

Alex Madonik, Councilor and
National Chemistry Week Coordinator

Sloan Research Fellowships

The Alfred P. Sloan Foundation is now accepting nominations for Sloan Research Fellowships in eight fields: chemistry, computational and evolutionary molecular biology, computer science, economics, mathematics, neuroscience, ocean sciences, and physics.

Consistent with the Foundation's tradition of supporting diversity in science, technology, engineering, and mathematics, nomination of women and underrepresented minorities is strongly encouraged. As leaders in these scholarly communities, ACS members are invited to help identify and nominate appropriate candidates.

These two-year, \$50,000 fellowships are awarded annually to 126 early-career faculty in recognition of their distinguished performance and exceptional potential as researchers. Candidates must be nominated by a department head or other senior researcher, and are selected by independent panels of noted scholars in each field.

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