

THE VORTEX

AMERICAN CHEMICAL SOCIETY
VOLUME LXXVI NUMBER 9

CALIFORNIA SECTION
NOVEMBER 2015



FEAST Science Teachers with “Science Night Family Fun” activity guides donated by the authors at Chabot Space & Science Center - 17 October 2015 © Alex Madonik

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California Section Women Chemists Committee Meeting

**Saturday
November 7, 2015**

Location

**Chevron Richmond
Technology Center**
100 Chevron Way
Bldg. 10 Auditorium
Richmond, CA

Lunch

Beijing Restaurant
199 Park Pl
Richmond, CA

Title

Tax Strategy

Speaker

Laurie Craise

Abstract

Laurie will discuss a number of topics, including:

1. Planning for retirement
2. Discussion of simple things you might be missing that can reduce your taxable income
3. Tax issues often particularly pertinent to women, for instance, caring for an elderly parent or children
4. Maximizing employer benefits, like 401(k) plan or stock options
5. Issues to consider if you are thinking of starting your own firm

About the Speaker

Laurie graduated from UC Berkeley with a degree in physiology, and after a year abroad in Europe joined a group at Lawrence Berkeley Laboratory. Initially she worked in basic medical research, but later studied the effects of heavy ions on human cells. After retiring from LBL, she continued heavy ion studies with NASA at the Johnston Space Center in Houston, TX, concentrating on the effects of heavy ions on human chromosomes. After leaving NASA, Laurie pursued a certification as a tax agent, and began preparing taxes full time. She also teaches both basic and advanced tax classes at H&R Block.

Time

11 a.m. — Arrival, meet the speaker

11:15 a.m. — Talk

12:15 p.m. — Talk concluded, walk to Point Richmond for lunch

Cost

\$15.00 Lunch, presentation is free

Reservation

Reservations required. Please register (including lunch or for talk only) by email to office@calacs.org, or by phone 510.351.9922. If mailing a check in advance, please make payable to "California Section ACS" and send to **Cal Section Office, 2950 Merced Street #225, San Leandro, CA 94577**, postmarked no later than October 27, 2015.

CalACS Outreach Activities Report

The California Section has been busy this fall with several programs to assist K-8 science and 9-12 high school chemistry teachers.

Teacher Workshops.

We had a successful workshop on October 10 at Petaluma High School hosted by Lee Boyes, our 2010 Lloyd Ryland Outstanding High School Teacher. Torey Arvik from Sonomecetics spoke on several innovative oils and flours made from grape seeds and skins which normally are considered waste products to the wine industry. The oils and flours have many of the same beneficial chemicals

found in wine. He also brought cookies made from grape flour to share.

On October 17, we hosted the FEAST workshop at Chabot Space Center in Oakland and Becky Milczarek, Ph.D., a scientist with the USDA, spoke on food safety labels and proper cooking of frozen foods. In response to complaints about the lack of taste with pre-cooked frozen foods, food preparers started distributing frozen foods that had not been previously cooked. These newer frozen foods must be cooked to specified temperatures to ensure food safety. Because microwaves

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THE VORTEX

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Chair's Message

Hello fellow ACS members, this will

be a brief update from your erstwhile (but procrastinating) Chair of CALACS. Lou Rigali, our diligent Vortex editor (and current Chair-elect) has tried everything in his

power short of bribery and homicide to ensure timely delivery of the Chair's message but, alas, I am late again.

In any event, in the past month, your CALACS Executive Committee has been quite busy preparing for our local section officer and national elections, completing reviews and changes to our Vision and Mission statements, preparing and distributing a member survey using Survey Monkey, doing community outreach and of course putting forth new evening



programs for our members. These activities are discussed on our website and in this future issues of the Vortex.

With this message, I wanted to highlight one event that occurred this summer: Our own Dr. Attila Pavlath was selected as the Harry & Carol Mosher Award winner by our colleagues in the Santa Clara Valley Section! Hopefully folks had an opportunity to read the article in C&E News in September regarding this announcement. We are delighted that Attila, who has contributed greatly to both National and Local ACS initiatives while pioneering a number of techniques in agricultural and fluorine chemistry, has been recognized for these contributions. Please join us when the award will be conveyed at a dinner meeting at the Basque Center in South San Francisco, CA on the evening of January 21, 2016. Also please join me in congratulating Attila!

Charles Gluchowski,

Save the Date January 2016 Section Meeting

Xiaoxi Wei, Ph.D. Founder & CEO, X-Therma Inc. www.X-Therma.com. A Bay Area start up company with the mission to develop potent biomaterials for both medical and industrial applications via Biomimetic Nanoscience. One of the major focuses is to deliver highly effective, non-toxic cryoprotective agents (CPAs) for advanced organ and tissue preservation media to allow for cutting-edge medical and surgical techniques.



Science *café*



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

IS ANYBODY OUT THERE?

The search for ET with help from
eight million volunteers

Tuesday, November 17, 2015

7:00pm – 8:30pm Community Hall

Guest Speaker: Dan Werthimer
University of California, Berkeley



Dan Werthimer is principal investigator of SETI@home and several radio and optical SETI programs at the University of California, Berkeley. Werthimer also directs the Center for Astronomy Signal Processing and Electronics Research (CASPER), and is associate director of the Berkeley Wireless Research Center (BWRC).

What is the possibility of other life in the universe and can we detect radio and optical signals from other civilizations? Berkeley's SETI@home project analyzes data from the world's largest radio telescope using desktop computers from millions of volunteers. These volunteers have the small but captivating possibility their computer will detect the first signal from a civilization beyond Earth.

Reservations: tinyurl.com/werthimer
\$5.00 Current donors, \$10 General Admission, payable at the door
Proceeds benefit the Lafayette Library and Learning Center

Lafayette Library and Learning Center Foundation
3491 Mt. Diablo Blvd., Lafayette, CA 94549 | 925-283-6513 x 102 | www.lllcf.org

November 2015 CALACS Section Meeting

Date: November 12

Place: Chevron Technology Center, Richmond

Schedule: 5:30 Social time with light snacks and refreshments
6:30 Presentation (1 hour)

Cost: \$10

Topic: Thorium nuclear fuel: benefits and challenges

Speaker: Prof. Massimiliano Fratoni

UC Berkeley Nuclear Engineering Department

RSVP: By Friday, November 6, 2015 by email to office@calacs.org or call (510-351- 9922). You may prepay by ending a check to Cal. Section, ACS at 2950 Merced Street, #225, San Leandro CA 94577 or pay with PayPal.

Directions: From SF Bay Bridge Take 80 North (Towards Sacramento), Exit Right on 580 at 80/580 Split. Continue about 6 mi from the split and take Richmond Pkwy/Pt. Richmond Exit. Chevron parking is directly across from the off-ramp. Pdf. maps available from the office.

Summary:

Thorium has been considered as a potential nuclear reactor fuel since the advent of the nuclear industry. Four times more abundant than uranium and with practically no fissile plutonium generated in the fuel cycle, thorium is often praised as a better alternative to uranium. This talk will explain the basic properties of thorium as a nuclear fuel, will review reactor and fuel cycle concepts aimed to use thorium, and will discuss potential benefits and associated challenges.

Speaker's bio:

Massimiliano Fratoni is Assistant Professor in the Department of Nuclear Engineering at the University of California, Berkeley (UCB). He received a Laurea

in Nuclear Engineering from Università di Roma "La Sapienza" (Italy), and a MSc and a PhD from the University of California, Berkeley. Prior to joining the Nuclear Engineering Department at UCB, he held a Research Scientist position at the Lawrence Livermore National Laboratory and a faculty position at The Pennsylvania State University. Prof. Fratoni's main research interests are in sustainable nuclear energy through advanced reactors and advanced fuel cycles that maximize natural resource utilization and minimize nuclear waste. Among other concepts, Prof. Fratoni is actively investigating solid and liquid fuel molten salt reactors and innovative sodium-cooled fast reactor designs.

Santa Clara Valley Section November Meeting

Join us to discover how to properly protect your IP in the early stages of developing your company as well as how to take full advantage of current laws to maximize your IP coverage for the long run.

The event is open as a public service of the ACS. Please be sure to register at the link http://www.scvacs.org/Local_Folder/meeting1511.html or email our chair at chair@scvacs.org

Date: Tuesday, November 10, 2015

Time: 4:00 PM Presentations, 5:00 PM Q&A, 6:00 PM Networking & Socializing

Location: Evans Analytical Group - EAG 810 Kifer Road, Sunnyvale



Chemical Catastrophes (Part 1)

Bill Motzer

On Wednesday, August 12, 2015, several large explosions occurred at a container storage station at the Binhai New Area of the Port of Tianjin, China. To date, 173 people have died, eight are still missing and 797 were injured. The first two explosions occurred within 30 seconds of each other, with the initial explosion registering as a magnitude 2.3 earthquake on seismographs, generating shock-waves with energy equivalents of 3 tonnes (t) of TNT. The second explosion followed, with an energy equivalent to 21 t, causing most of the damage and injuries (Figure 1). Fireballs, reaching hundreds of meters, were observed from space (Figure 2) and shock-waves were felt many km away.

It's believed that fires caused by the initial explosions continued burning uncontrolled throughout the weekend, repeatedly caused secondary explosions, with eight additional explosions occurring on Saturday, August 15th. Although the immediate cause of the explosions remains unknown, Chinese state media reported that at least the initial blast was from some unknown hazardous materials in stored shipping containers at a plant warehouse owned by Ruihai Logistics, which specializes in handling hazardous materials, including flammable and corrosive substances, oxidizing agents, and toxic chemicals. Additionally, a 2014 document noted that calcium carbide, and ammonium, sodium, and potassium nitrate, and 700 t of sodium cyanide were stored at the facility. Ammonium nitrate, primarily used in fertilizer manufacturing, has caused other fatal explosions (e.g., Texas City in 1947). In combating the initial fire, firefighters may have inadvertently sprayed water on the calcium carbide. The reaction released highly volatile and flammable acetylene gas [$\text{CaC}_2 + 2\text{H}_2\text{O} \rightarrow \text{C}_2\text{H}_2 + \text{Ca}(\text{OH})_2$], subsequently detonating the ammonium nitrate. Sodium cyanide is soluble in water and, when dissolved or

burned, releases highly poisonous hydrogen cyanide gas. However, sodium cyanide generally is not explosive nor flammable, requiring concentrations of more than 6%, and concentrations generated from mixing water and sodium cyanide probably were about 0.03%. (See C&EN: August 24, 2015, v.9, issue 33, p.9 and September 7, 2015, v. 93, issue 33, p. 10.)

Although China has some of the most rigorous chemical safety handling procedures and guidelines on the books, these often are either not enforced or followed. The U.S. enforces its chemical safety under several federal agencies such as the EPA's Occupational Safety and Health Administration (OSHA) requiring that persons in occupations requiring handling or exposure to hazardous materials and wastes, must receive training in several specified levels. The federal law mandating such training was issued in March 1989; it became effective in March 1990. This law was enacted because of the hazards associated with generation, treatment, storage, transportation and handling of hazardous materials associated with passage of the 1976 Resource Conservation and Recovery Act (RCRA) and the cleanup of hazardous wastes sites as required by the 1980 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The OSHA requirements are codified in book 29 of the Code of Federal Regulations (CFR), Part 1910.120. Employers with employees working in the hazardous chemicals and waste fields at the time of the law's issuance were given the one year period to train and certify their employees under the new law's requirements. Employees hired after the law was enacted were required to receive their training and certification prior to their beginning to work with hazardous waste. For worker safety, California has adopted the federal regulations as its own and they are codified in Title 8 of California Code of Regulations (8CCR) Section 5192.

In future parts, I'll discuss chemical and hazardous material/wastes safety practices in more detail, including ACS's role in chemical safety practices and guidelines.

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Figure 1: Aftermath of Tianjin warehouse explosions. The New York Times; annotated photograph by Yue Yuewei, Associated Press.

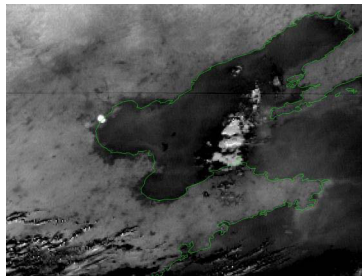


Figure 2: Tianjin warehouse explosions, a bright white spot on the left side of the photograph, by Japan Meteorological Agency's satellites. Photograph from The Guardian at www.theguardian.com.



CalACS ACS Elections

Please remember to vote in your local Section.

The following is a list of candidates for CalACS, or what the ballot will include

Chair Elect (vote for one) – James Postma, or Write in

Treasurer (vote for one) – Paul Vartanian, or Write in

Director (vote for one) – Mark Frishberg, Attila Pavlath, or Write in

Member At Large (vote for no more than three) – Liam Berryman, Dan Calef, Margareta

Sequin, Igor Sobolev, or Write in

Councilor (vote for no more than three) – Lee Latimer, Patrick Lee, Stephanie Malone,

Eileen Nottoli, or Write in

Unless you have notified the Section differently, the ballots will be sent digitally.

*American Chemical Society
45th Western Regional Meeting
(WRM 2015)
November 6-8, 2015
California State University*

Registration is open for the 2015 Western Regional Meeting! Don't miss this opportunity to network with Western Region scientists and to see some of the wonderful sights in north San Diego County.

The weekend is packed with presentations and posters that reflect the diverse and exciting scientific work conducted in the Western Region. Scientists and science professionals are joining the Western Regional Meeting from several states and countries. The meeting will be a "green meeting" in that all attendees will receive program and abstract materials on a flash drive. Attendees are encouraged to bring their laptops, tablets and smart phones, as we may also have the new ACS Regional Meeting mobile app for you to use while you are at the meeting.

Do you know a high school teacher who could benefit from a special track of programming on Saturday designed specifically for high school chemistry teachers? Our Educator's Day program is packed with information at a cost of \$25. If you want to register for Educator's Day only, use the code EDUCATE in the Promo Box for the special rate.

REGISTER HERE!

The social and networking events for WRM 2015 are almost at capacity and will kick off Friday afternoon with the Women Chemist's Luncheon. Dr. Susan Baxter from San Diego State University will be the keynote speaker. The YCC will have a Networking Reception on Friday night that is sponsored by the Orange County Local Section before Sci-Mix. The social and networking events will conclude Saturday night with the WRM 2015 Awards Reception at Stone World Bistro & Gardens near the CSU-San Marcos campus. Attendees will be treated to a lovely evening of world class beer, appetizers and scientists, while we celebrate our WRM award winners. If you have questions about any of these events, please E-mail us at WRM2015Chair@gmail.com. You can also find information about local hotels at our website: <http://wrm2015.sites.acs.org/>.

Past ACS President Dr. Thomas Barton will be leading an Industry Forum on Saturday morning for industrial chemists. Several ACS Governance members will be meeting with attendees during the "Chips & Chat" Event on Saturday afternoon, and again at the Awards Reception at Stone World Bistro & Gardens. Don't miss these fantastic opportunities to provide input to our Society's leaders.

Exhibitor and Sponsor Packets are found at <http://wrm2015.sites.acs.org/> and still offer a number of unique opportunities to get involved and network. Please visit <http://wrm2015.sites.acs.org/> to get more information. We want to thank some of our current Exhibitors: Pine Research Instrumentation (www.pineinst.com/echem); TCI America (www.tcichemicals.com); Magritek (www.magritek.com); Grace Discovery Sciences (www.grace.com); Bruker AXS Inc. (www.bruker.com); Anasazi Instruments, Inc. (www.aiinmr.com); Perkin Elmer (www.perkinelmer.com); California State University – San Marcos; California State University – San Marcos School of Science and Math; Quark Glass (www.quarkglass.com); Teledyne Isco (www.isco.com); Nanalysis Corp. (www.nanalysis.com); AK Scientific (www.aksci.com); HealthScience (www.healthscience.com); and Sigma-Aldrich (www.sigmaaldrich.com).

One of our Exhibitors – Magritek – will be hosting a workshop on NMR instrumentation on Saturday afternoon, November 7, as a part of the meeting. Current users and spectroscopists will share their experiences implementing benchtop NMR in their curriculum and to

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advance their research and enhance the student learning process. Snacks and refreshments will be provided. See our website at <http://wrm2015.sites.acs.org/> for more information.

If you are interested in volunteering at WRM, please contact us at WRM2015Chair@gmail.com for more information and opportunities.

Follow us on Twitter at: [@2015WRM](https://twitter.com/@2015WRM) for real time updates and meeting information. We will be live tweeting the meeting as well, including tweeting information about our speakers, posters, exhibitors and sponsors, so don't miss this opportunity to be a part of this social networking experience!

Questions?

2015 WRM Chair: Dr. Sandra Thompson (WRM2015Chair@gmail.com)

Programming Co-Chairs: Dr. Michael Kleinman and Dr. Keisuke Ikehata (WRM2015Abstracts@gmail.com)

Awards Chair: Dr. Sanda Sun (WRMAwards@gmail.com)

Partners for Progress and Prosperity Award



Elaine Yamaguchi will be presented with the P3 award at the Western Regional Meeting November 7 in San Diego

The purpose of the award is to encourage and recognize successful and exemplary partnerships, a Partners for Progress and Prosperity (P3) award to be given by Local ACS Sections, ACS International Chapters, and ACS Regional Meetings.

Gifts & Donations

As noted in the report from Eileen Nottali and Alex Madonik, the Sections has many outreach programs to help support science and chemistry in our community schools. You can help support the programs including the work with the High School Chemistry Teachers programs through your donations. Call or email and find out how your valued contribution can be use.

Lou Rigali, LR101898@aol.com

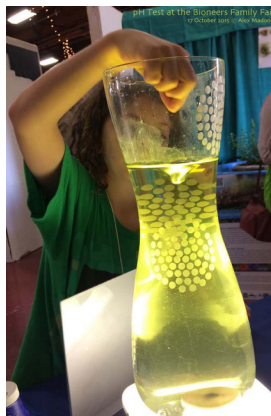
Activities: continued from page 2)

heat unevenly, this means that consumers must follow directions.

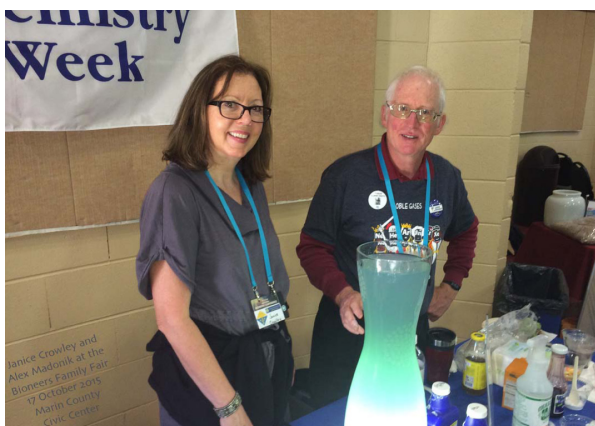
We plan to do a number of climate science demonstrations that teachers can use in their classroom at the next FEAST workshop on November 14.

At both events, we handed out goggles and supplies that teachers can use in their classroom.

Donation Needs. Teachers are in need of usable equipment and supplies for their classroom. If you have any equipment or wish to make a cash donation to support these efforts, please contact our office.



Alex Madonik, Eileen Nottoli



Top: Where did the Milk of Magnesia go? Above: Janice Crowley and Alex Madonik at the Bioneers Family Fair



Left: Giant bubbles at sunset. Above: Kent Campbell's flaming money was not even singed.

BUSINESS DIRECTORY

SEARCHING FOR THAT SPECIAL JOB?

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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