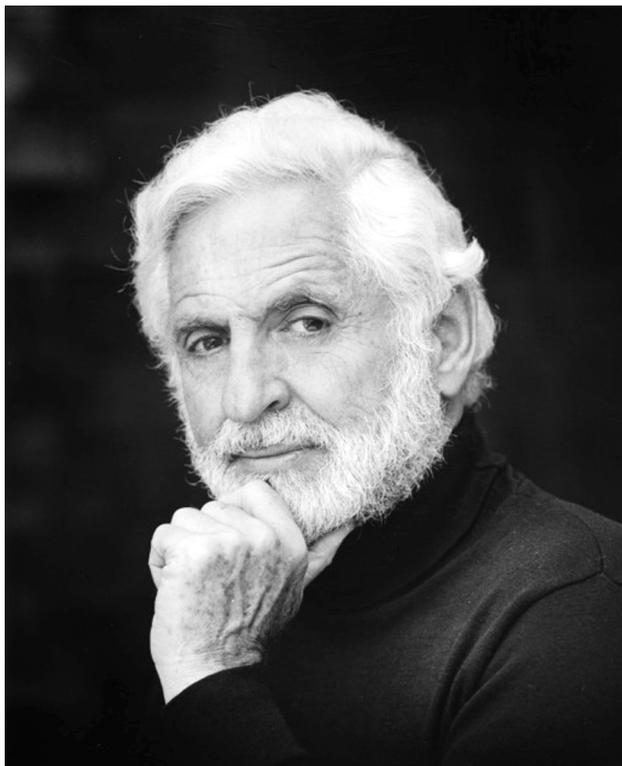


THE VORTEX

AMERICAN CHEMICAL SOCIETY
VOLUME LXXV NUMBER 9

CALIFORNIA SECTION
OCTOBER 2014



Carl Djerassi, Chemist, Philanthropist, Writer

Table of Contents

OCTOBER SECTION MEETING	PAGE 2
THE CLOCK RUNS BACKWARDS (L. RIGALI)	PAGE 2
CHAIR'S MESSAGE	PAGE 3
COUNCILORS' REPORT	PAGE 4
WCC MEETING	PAGE 5
EARTHQUAKE CHEMISTRY PART 1 (W. MOTZER)	PAGE 6
JENNEL BALL RECIPIENT OF THE JAMES CONANT BRYAN AWARD	PAGE 7
SOLANO STROLL REPORT	PAGE 8
THE REAL PURPOSE OF NSW (ATTILA PAVLATH)	PAGE 9
SECTION UPCOMING EVENTS	PAGE 9
NEW SECTION ACS FELLOWS	PAGE 10
BUSINESS DIRECTORY	PAGE 11
INDEX OF ADVERTISERS	PAGE 11

Join the California and Santa Clara Valley Sections of the ACS for a very special evening with Dr. Carl Djerassi at an exclusive performance of his play:

Date: Tuesday, October 21, 2014 This special event is exclusively for ACS members and guests.

Time: 6-7 PM, Pre-show social w/food; 7PM Performance of *Insufficiency*; immediately followed by post-show activities. No Host Cash Bar available.

Location: Z-Space Theater, 450 Florida St, San Francisco, CA 94110

Cost: \$50.00 – Includes pre-show appetizers and soft drinks, the performance of *Insufficiency*, a special and unique, post-show discussion with Dr. Djerassi on “Chemistry in the Arts” followed by a post-show reception with a drawing for books autographed by Dr. Djerassi. Plus... Dr. Djerassi’s new Autobiography “In Retrospect: From the Pill to the Pen”, scheduled to be released in November 2014, will be available in advance of the official release, at the theater with the author’s discount of 30% (Approximately \$20).

Reservations: ARE REQUIRED! Please contact Julie Mason at office@calacs.org, 510-351-9922. Your reservation is not confirmed until payment is received. Payment must be received no later than October 1, 2014 by sending a check to CalACS at 2950 Merced Street, #225, San Leandro CA 94577 or by Paypal go to <http://www.paypal.com> > Send Money > Send Money Online > To: office@calacs.org and follow the instructions. Play info: <http://zspace.org/new-work/insufficiency-by-carl-djerassi>
Tickets are very limited so reserve your seats early!

*The Clock Runs Backward**

Carl Djerassi (born October 29, 1923 in Vienna, his mother, Alice Friedmann, a Viennese dentist and physician, his father, Samuel Djerassi, a Bulgarian dermatologist. In the effort to flee the Anschluss, his parents remarried each other, the mother leaving Austria and settling in upstate New York. The father and son escaped to Bulgaria. Carl attended an American school in Bulgaria for 18 months or so, completed two years of high school at an American school where he learned English and Bulgarian. In December 1939 he arrived in New York where he joined his mother. From a teacher in Bulgaria Carl was given the name of a Professor at NYU who would recommend a high school for Carl. The Professor thinking that Carl was to applying at NYU, indicated that NYU had no classes that started in January, but that Newark Junior College did. And without disabusing the helpful Professor that he was looking for a high school, Carl enrolled and completed two years at Newark and never graduated high school. He attended

Takio College in Takio MO, and changed to Kenyon College in Ohio, where he graduated *summa cum laude* in 1942 and then earned his PhD in Chemistry at University of Wisconsin in 1945.

In 1942 he joined CIBA in New Jersey as a junior chemist and developed Pyribenzamine, one of the first antihistamines.

In 1943 inspired by the work and publications of Louis Fieser on steroid chemistry, he went to graduate school at Wisconsin, one of the few schools working on steroid chemistry and completed his PhD in 2 years. Carl credits his successful work on steroids in part on chromatography that he used at CIBA.

In 1949, now a twenty six years old, a Senior Chemist at CIBA, he received a letter from a Mexican-based company doing research on steroids. They wanted to synthesize cortisol. Against the advice of many, Carl accepts the offer from Syntex. He describes his two years at Syntex in Mexico as his most productive years with over 60 publications and the first to synthesize cortisol and then

Continued on page 4

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 \$13 annual dues payment. Nonmember subscription \$15.

MAGAZINE OF THE CALIFORNIA SECTION, AMERICAN CHEMICAL SOCIETY

EDITOR:

Louis A. Rigali
255 4th St. Ste #101 Oakland 94607

510-268-9933

ADVERTISING MANAGER:

Vince Gale, MBO Services
Box 1150 Marshfield MA 02050-1150

781-837-0424

OFFICE ADMINISTRATIVE MANAGER

Julie Mason
2950 Merced St. # 225 San Leandro CA 94577

510-351-9922

PRINTER:

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

510-268-9933

CONTRIBUTING EDITORS:

Evaldo Kothny
William Motzer

EDITORIAL STAFF:

Evaldo Kothny
Alex Madonik
Mark Frishberg
Margareta Sequin
Linda Wraxall

For advertising and subscription information, call the California Section Office, 510 351 9922,

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

California Section Webstore: <http://calacs.deco-apparel.com/>



Chair's Message

Mark Frishberg

As we enter the busiest part of our very active fall schedule, we have already had our first fall local section meeting, at the Buck Institute in Novato, and participated in the Solano Stroll, where tens of thousands of people, of all ages, passed by our booth on Sept. 14th, many of whom stopped by to talk chemistry, perform demos, and take away ACS and local section literature. Now in October, we are preparing for National Chemistry Week, from October 19-25. NCW will kick-off on Sunday, October 19th with a public outreach event for the Fairfield Girl Scouts. Then on Tuesday, October 21st we will have a special event at the Z Theatre in San Francisco with a private performance of Carl Djerassi's play, "Insufficiency," followed by his discussion on chemistry in the theatre. Next comes Family Science Night at Helms Middle School in San Pablo on Wednesday, October 22nd. Our extensive schedule of public outreach events wraps up with the Bay Area Science Festival on Saturday, November 1st at AT&T Park. I expect to be at all of these events, and look forward to seeing many of our members participating.

While on the subject of participation, I want to mention three areas where you, as a local section member, can help us do more – ideas,

involvement, and funding. CAL-ACS is a very active section, as our recognition as the Outstanding Local Section in our size category for two of the past three years attests. With over 3400 members, however, we certainly have the critical mass to do more.

Ideas – CAL-ACS supports many activities each year with a primary focus in the public outreach area. These are important, but are there other areas where members and our community are not being adequately served? New ideas always bring with them new energy and the involvement of new people. Is CAL-ACS helping you get the most out of your ACS membership? Do you have any ideas to help us do more, and to give you the opportunity to gain while giving?

Involvement – CAL-ACS has a core group of very energetic and dedicated active members. This group, however, is getting older and needs to be expanded, especially with younger members. This is one of my goals for my year as Chair, as well as resurrecting the Long Range Planning Committee, and these goals have not yet been met. In addition, we have several committees in need of new Chairs and many committees would benefit from some new blood. The Younger Chemists Committee and the Publicity Committee are currently without Chairs and active members, and I would like to add members to the Awards Committee so that we can make an effort to nominate worthy members

(continued on page 8)

(Continued from page 2)

the oral contraceptive.

The bio continues...his work with juvenile hormones for insect control for which he received the National Medal of Technology... the companies he started or was instrumental in starting such as Zoecon, Syva (the joint venture between Syntex and Varian) and Sandoz... his work at Wayne State and Stanford.... his many awards including The National Medal of Science for his work on the "Pill"...his novels and plays... and his support for artists. Accomplishments that may indeed require the three published autobiographies.

In 1979 with the help of his wife, then Stanford Professor Diane Middlebrook (died in 2007), Djerassi sets out to establish a comprehensive residency program for artist, The Djerassi Resident Artists Program, available to male and female artists in a variety of disciplines. To this end he supports the venture through the sale of his art collection and his ranch properties in the

hills of California. For more information see <http://www.djerassi.org/index.html>

At age 63, 1987, he started a new career as a novelist, poet and playwright with over 40 literary works including about 5 novels, 11 plays and numerous poems and the three autobiographies.

It is in his science-in-fiction where Carl looks to shine a light on the tribal culture of scientists, rather than dwelling on the science they do.

Carl Djerassi, an outspoken chemist, a Poet of Progressive Science¹ can offer the California Section and chemists everywhere wisdom and insight. One such relevant topic is, even as he considers chemistry as the core of all the sciences, Carl would not major in chemistry today.

Lou Rigali

*The Clock Runs Backward and other Poems by Carl Djerassi

¹Dardis McNamee, *The Vienna Review*, 2012



248th ACS National Meeting San Francisco, CA August 10-14 Councilors' Report

The California Section sends Councilors and others from the Section who participate in the various governance committees and activities and meet biyearly at the ACS National meetings. The women and men who give direction to the ACS are shown below.

The Section requires a report which has

been published in full and placed on the Section website, www.calacs.org. from each of those Councilors noted below

The Summer and Fall meeting schedule is as noted. Please note that in August 2017 the ACS will be back in San Francisco.

S2015	Denver
F2015	Boston
S2016	San Diego
F2016	Philadelphia
S2017	San Francisco
F2017	Washington
S2018	New Orleans
F2018	Boston
S2019	Orlando
F2019	San Diego

Bryan Balazs, Michael Cheng, Sheila Kanodia, Lee Latimer, Alex Madonik, Eileen Nottoli, Attila Pavlath, Paul Vartanian and Elaine Yamaguchi

*Women Chemists
Committee
Meeting
Saturday, October 11, 2014*

Title: The Genetics of Flower Formation

Speaker: Dr. Jennifer Fletcher

Place: USDA 800 Buchanan Street Albany, CA

Time/Schedule: 11:00 a.m. Meet the speaker and network with other participants 11:30 a.m. Lunch Noon Presentation: The Genetics of Flower Formation

Cost: \$16 lunch (students and unemployed chemists \$8). 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 September 27, 2014

Abstract

Flowers are breathtakingly beautiful structures and are also critical for plant reproduction. Yet despite the fact that plants such as roses, orchids and lilies generate very distinctive flowers, they have a shared underlying configuration. Flowers consist of four organ types – sepals, petals, stamens and carpels – that are produced by conserved genetic mechanisms. This talk will describe how flowers are derived from stem cell reservoirs found at the growing shoot tips and how a small set of related transcription factors specify the identity of the four organ types through a combinatorial code. I will also discuss how the termination of stem cell activity during flower formation is directed by a temporal negative feedback loop involving stem cell regulatory genes, floral organ identity genes and chromatin modifying genes. These studies illustrate the use of molecular genetic tools to dissect the pathways that produce key aspects of the common flower form.

Biography

Jenn is a molecular geneticist who studies the functions of stem cells in plants. A native of Colorado, she obtained her Bachelor of Arts degree from the University of Chicago and her Doctor of Philosophy degree from the University of Utah. After a four-year stint as an NIH postdoctoral research fellow at Caltech she joined the USDA-ARS Plant Gene Expression Center in 1999 to lead a laboratory studying the genetic pathways that maintain the stem cell reservoirs in shoots and flowers. She is also an Adjunct Associate Professor in the Department of Plant and Microbial Biology at UC Berkeley, where she co-teaches an undergraduate course in plant molecular genetics. Jenn is the author of more than 50 research articles, including two in the journal *Science* and has been interviewed about her research by several newspapers and national magazines. She has given dozens of seminars at conferences, universities and corporations throughout the world, as well as contributing to public educational video series and textbooks. In 2005 she was awarded the USDA Pacific West Area Early Career Research Scientist of the Year award for her lab's work investigating plant stem cell biology.

Driving Directions
From Oakland
Take I-80 North, exit Buchanan
Street, turn left onto Buchanan
Street, continue east one block,
turn Right into USDA driveway.

From Vallejo
Take I-80 South, exit
Albany, turn left onto Cleveland Avenue
(S), left on Solano Avenue (E), right on
Taylor Street (S), cross Buchanan into
USDA driveway



Earthquake Chemistry (Part 1)

Bill Motzer

At times current events may preempt this column's planned topic.

Such is the case of Sunday, August 24, 2014, when many of us in the San Francisco Bay area were awakened from a sound sleep at 3:20 AM PST by a 6.0 magnitude (M_w) earthquake with its epicenter near the town of American Canyon. (Actual epicenter location was 6 km NW of American Canyon, 8 km SSW of Napa, California and 13 km NNW of Vallejo, California.) The South Napa Earthquake was relatively shallow, occurring at a depth of 11.2 km. Of course residents in Napa, American Canyon, and Vallejo were jolted out of their sleep (and their beds) because of more intense local shaking (see shake map). According to the Office of Emergency Services, more than 170 people were injured, and 100 homes are now uninhabitable with damage largely to unreinforced brick and masonry buildings, wineries (broken barrels and bottles), mobile homes, some roads, and broken gas and water mains largely in Napa and Vallejo. Costs are estimated to be at least one billion dollars. (See drone video of damage at: <https://www.youtube.com/watch?v=LQhYbflz0n4#t=237>.)

Aftershocks continued more than a week after the main shock ranging into the 3.0+ M_w range with about a ~5% chance that a 5.0 M_w could still occur.

The earthquake occurred near a branch of the West Napa Fault, which lies between two major active fault systems: the Hayward-Rodgers Creek Fault system on the west and the Concord-Green Valley Fault system on the east. U.S. Geological Survey (USGS) and California Geological Survey geologists, seismologists and engineers were soon in the area, mapping fracture zones and patterns, and assessing building damage.

In the U.S., earthquakes are generally studied by seismology, a branch of geophysics that includes the propagation of elastic waves through the Earth. For years seismologists have attempted to forecast probable timing,

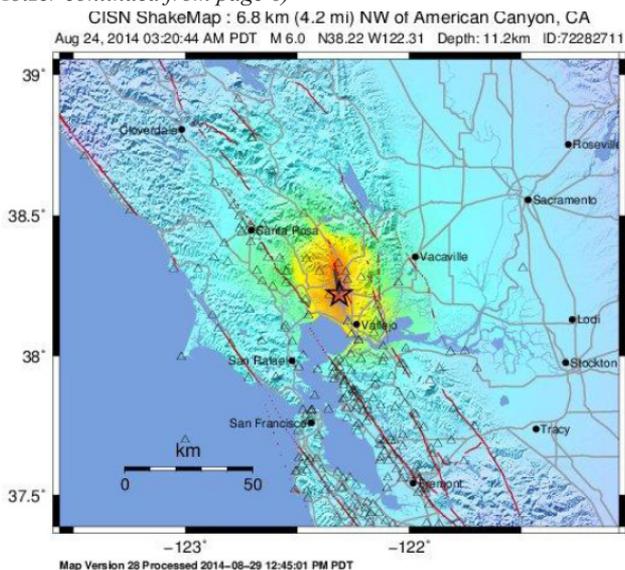
location, magnitude and other important features of future seismic events; this is known as earthquake prediction. However, most seismologists do not believe that earthquake prediction systems can currently be developed to provide knowledge of impending earthquakes. Therefore, in the U.S., the current focus is in generalized forecasting to predict seismic hazards probability such as estimating earthquake size (e.g., maximum credible earthquake), probability of occurrence for a particular area (e.g., on known active faults) and within a particular time-span (i.e., 30 years). Additionally, warning systems similar to those currently used in Japan are also being developed alerting the public that a sizable earthquake is occurring. Such systems would give perhaps as much as 15-20 seconds of warning outside of the epicenter so that building occupants and public transportation systems could take shelter or evacuate buildings.

In the 1960s (and through 1990s) scientists in the U.S. and other countries (e.g., Japan, China, and the Soviet Union) were searching for methods other than seismology to predict earthquakes. Several hydrochemical earthquake precursors in different seismic-tectonic regions were published in the scientific literature. A review of these observations can be found in different publications including C&EN (November 8, 1999, v. 77, n. 5). In the early 1970s some researchers were increasingly optimistic that hydrochemistry would solve the earthquake prediction problem. But the number of hydrochemical precursors, which constantly increased, was extremely difficult to monitor and nearly impossible to interpret. Therefore, in the U.S., such lines of research were generally abandoned.

There is evidence, however, that dissolved ground water constituents such as Rn, He, Ar, CO_2 , CH_4 , H_2 , O_2 , N_2 , Na, Cl, Hg, Rb, Cs, SiO_2 change concentrations before, during, and after an earthquake. Some stable and radiogenic isotopes such as D/H, $18O/16O$, $222Rn/226Ra$, $234U/238U$, $13C/12C$, $4He/40Ar$ also vary in detectable concentrations and ratios. And these will be further discussed in a future article.

(continued on page 7)

(Motzer continued from page 6)



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%)	<0.1	0.5	2.4	6.7	13	24	44	83	>156
PEAK VEL.(cm/s)	<0.07	0.4	1.9	5.8	11	22	43	83	>160
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X

Scale based upon Wood, et al., 1999

Shake map from USGS at: <http://earthquake.usgs.gov/regional/nca/maps/>

Chico High School Chemistry Teacher Wins National Award



Jenelle Ball who teaches at Chico High School has won the prestigious James Conant Bryant award from the American Chemical Society (ACS). The award will be presented at the ACS national meeting in Denver on March 24, 2015 along with a check for \$5,000. Based on the estimate that there are over 955,000 high school chemistry teachers, Mrs. Ball is one in a million.

Ms. Ball is the first high school chemistry teacher from the California Section and the second teacher in California to be awarded this honor. Ms. Ball has taught high school chemistry at Chico High since 1987 and has provided her students with a sound foundation in chemistry. Her students are so well prepared with the ability to conduct experiments and analyze data that some are able to skip general chemistry courses in college.

Mrs. Ball is no stranger to awards. Among her several awards, she was one of the two outstanding high school chemistry teachers with the ACS California Section in 2010 and the Chico Rotary Club Educator of the Year for 2009-2010. Ms. Ball was awarded a bachelors degree in chemistry from California State University, Chico, a masters degree in chemistry from the UC, Santa Cruz, and a masters in science education from the UC, Santa Barbara. She also attends professional development courses. In addition to publishing several articles in the *Journal of Chemical Education*, she has made numerous presentations to science educators at national ACS and educational societies.

(Chair Continued from page 3)

for some of the National ACS awards. Elaine Yamaguchi has been doing yeomen's work in running our Project Seed effort and could certainly use a second in command, or two. The Employment and Career Assistance Committee has been dormant too long in this challenging employment environment, and I plan to restart it personally by the end of the year. There may be other committees that we should add. The National ACS now has a Senior Chemists Committee. Should CAL-ACS have one? By the end of the month, one initial step will be taken as we will begin sending welcoming letters to new section members. If we are able to grow our Membership Committee, ideally it would be great to follow-up with members who have dropped their ACS membership, to try to learn why and what we can do to reverse

any trend that might be developing.

Funding—As we enter our annual budgeting period, we are sure to struggle over funding issues for our many programs. Last year we were forced to make several unfortunate cuts, not the least of which was to reduce our funding of Project Seed, a program very dear to our hearts, as this National ACS program originated here. When it is time to renew your ACS membership, please choose to pay your voluntary local section dues to help us maintain and expand our programs, and remember that you can always earmark support for the program of your choice, or a new program, by sending a donation at any time of the year to our local section office. Members can reach me, or any other Committee Chairs or members, through our local section office at office@calacs.org or by phone to 510-351-9922.



CalACS at the Solano Stroll

The California Section returned to the Solano Stroll on September 14th, 2014, as the people of Berkeley and Albany filled the street on a beautiful Sunday. We spoke with hundreds of visitors, handing out copies of the NCW 2014 edition of Celebrating Chemistry, “The Sweeter Side of Chemistry: Candy” accompanied by Jelly Belly Beans. Many visitors also helped us count samples of Good ‘n Plenty candies (twelve at a time) and the final total was 709 white (53%) and 623 red (47%) based on 111 samples. We also displayed the Chemical & Engineering News cover story, “The Case Against Added Sugars” (04 August 2014) to let people know that sugar can be a mixed blessing.



Our colorful display was decorated with ACS banners and our ChemLuminary Award poster, showcasing our community outreach programs (Project SEED, Family Science Night, and the Women Chemist Committee symposium at last year's Western Regional Meeting). Visitors also enjoyed the changing colors of Milk of Magnesia and a universal pH indicator as we stirred in doses of vinegar to simulate “acid stomach.”

It was a great day to make contact with science teachers, parents, and kids who welcome our support for STEM education and science literacy. Thanks again to the USDA and everyone who helped out!

Alex Madonik





THE REAL PURPOSE OF NATIONAL CHEMISTRY WEEK.

Attila E. Pavlath, ACS President 2001

Recently, in a Reno museum a colorful chemical demonstration was performed which went wrong and 13 children were hurt. This unfortunate event might have been prevented by greater precaution, but its failure certainly made headlines, while if it had been successful it probably would not have created any publicity. However, even under the safest conditions accidents can happen. Throughout the country many similar demonstrations are carried during National Chemistry Week drawing large audiences. Especially children are awed by these experiments.

The question can be raised about the purpose of these colorful demonstrations? What is the aim? The audience, in large part, is composed of young children. Are we trying to get them interested in chemistry? They are probably too young to make career decisions. I doubt it will make any influence in their plan when they select their major in college. Is the purpose to get more chemists or are we trying to improve the public image of chemistry? Such experiments do not tell anything about the importance of chemistry in our life. If there are adults in the audience they might be entertained just as at a Fourth of July firework, but they do not learn anything about chemistry.

When George Pimentel conceived the idea

of National Chemistry Day/Week, he saw the need for the public to understand the benefits of chemistry, and that is why he proposed this nationwide program to achieve it. The following is a summary of his plan as reconstructed by his widow, Mrs. Jeanne Pimentel, from his proposal.

“The purpose was to convince local congress people, schools, clubs, and other citizens’ groups of the importance of chemistry, and to encourage local chemistry industry managers to increase their interaction with the local communities. He wanted chemistry faculty members to visit Rotary and Lions Clubs and other civic organizations, not just during NCW but regularly, to speak in layman’s terms about the accomplishments of chemistry.”

Demonstrations can be very spectacular, but they do not carry this message. Unfortunately, in the NCW instructions to the Local Sections by the National ACS George Pimentel’s message is lost. I think we have to find interesting, appropriate and innovative new programs for NCW to show the audience how chemistry contributes to their everyday life. For example, we can have question/answer/quiz periods, posters, U-tubes and short talks. We can list chemical developments they generally use in transportation, communication, food and medication. We should get a group together to brainstorm various possibilities how to direct attention to the benefit of chemistry in our everyday life without possible endangerment of the audience.

I invite you to send me your thoughts and suggestions at Attilapavlath@yahoo.com.



UPCOMING FALL 2014 CALIFORNIA SECTION EVENT SCHEDULE

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.

ACS Fellows

The American Chemical Society (ACS) Fellows Program was created by the ACS Board of Directors in December 2008 to recognize members of ACS for outstanding achievements in and contributions to science, the profession, and the Society. The following CalACS members were presented their awards by ACS Immediate Past-President Marinda Li Wu, at the August ACS meeting in San Francisco.



Alex Madonik Green Science Policy Institute



Carolyn Ribes Dow Chemical



T. Don Tilley University of California, Berkeley, and LBNL



Paul F. Vartanian Chevron Oronite (Retired)

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>

NMR_{Service} 500MHz

*Mass

*Elemental Analysis

NuMega Resonance Labs

numegalabs.com P-858-793-6057

TELL OUR ADVERTISERS

Advertisers want to know if their ads are working. When you call or write them, tell them you saw their ad in The Vortex. This will allow us to increase the amount of articles that you have asked for.

Accelerate Your R&D

Custom Synthesis
Process Research & Development
Medicinal Chemistry
Analytical Investigations

 **CHEMIR**
EVANS ANALYTICAL GROUP

800.659.7659
www.chemir.com

WHAT OUR ARTICLES

When you tell our advertisers that you saw their ads here they have more confidence in our newsletter's viability as an advertising medium. They advertise more. This supports our many activities.

Thermal Analysis - DSC, TGA, TMA, DMA
Surface Characterization - AFM
Materials Consulting

Pinnacle Materials Laboratory
Material Specialist for Composites
29520 Union City Blvd | Union City, CA 94587
www.pinnmatlab.com | Tel: (510) 489-2620

PML

INDEX OF ADVERTISERS

Promote	11
ACS Vortex	11
Chemir	11
NuMega Resonance Labs	11
Pinnacle Material Laboratory	11
Robertson Microlit	BP

Non-Profit Organization
U.S. POSTAGE

TIME VALUE

CALIFORNIA SECTION
AMERICAN CHEMICAL SOCIETY

PLEASE DO NOT DELAY - DATED NOTICE INSIDE



Robertson Microlit Laboratories

Where speed and accuracy are elemental

Elemental CHN, S, X, Analysis (same day service)

Metals by ICP-OES, ICP-MS, A/A

FTIR, UV/VIS Spectroscopy

Ion Chromatography

Bioavailability

Polarimetry

DSC, TGA, melting point

KF Aquametry, Titrimetry

1705 U.S. Highway 46 • Suite 1D • Ledgewood, NJ 07852 • 973.966.6668 • F 973.966.0136

www.robertson-microlit.com • email: results@robertson-microlit.com

Rapid Results • Quality • Accuracy • Competitive Pricing