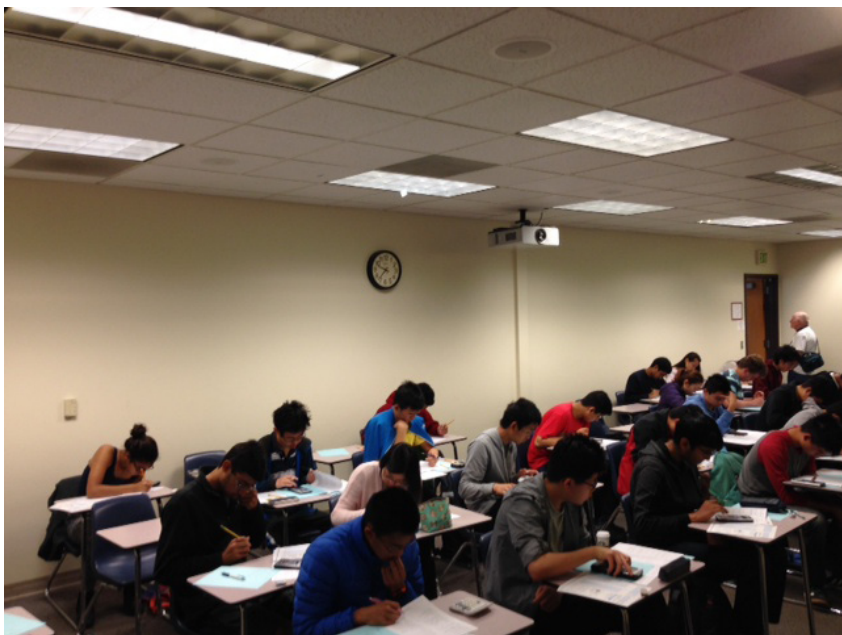


# THE VORTEX

AMERICAN CHEMICAL SOCIETY  
VOLUME LXXVI NUMBER 5

CALIFORNIA SECTION  
MAY 2015



Students from the CalACS Section taking the Chemistry Olympiad test last month

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*Report From The ACS National Meeting*  
*Denver, CO, March 22-26, 2015*  
**Highlights from the Denver Meeting**

For the California Local Section, there were two especially significant highlights at this meeting. On Sunday afternoon the James Bryant Conant Award winner for

The second significant highlight was saved until Wednesday at the Council meeting when one of our Councilors, Dr. Bryan Balazs, was selected by Council from a slate of four nominees as one of the two candidates for President-Elect of the ACS for 2016. Congratulate Bryan when you see him! The other candidate is Dr. Allison Campbell from the Richland Local

Section and Pacific Northwest National Laboratory.

Prior to the start of the ACS meeting, a Presidential Public Outreach event: Exploring Our World Through Chemistry, which has become a feature on the Saturday preceding National Meetings, was held at the Denver Zoo, with over 600 people attending.

The overall theme of the Denver meeting was "Chemistry of Natural Resources" which was a repeat of the theme of the spring 2011 meeting in Anaheim. As usual a plenary session on Sunday afternoon highlighted and introduced the overall theme, while Division programs related to the theme continued throughout the



CSU Fresno Chem Club's Nick L. Mole at the Denver Zoo outreach event

Outstanding High School Teaching, Jenelle Ball from Chico High School, presented her award address. Jenelle was also recognized on stage during the overall ACS Awards banquet on Tuesday evening.

week. Over 10,000 papers and posters were presented in Denver. Three Presidential Symposia were held: "Chemistry Without Borders: The Transnational Practice of Chemistry and Allied Sciences and Engineering; "Nanotechnology: Delivering on the Promise" and "DOE Nanoscience Research Centers: "National Resources for

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# 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

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

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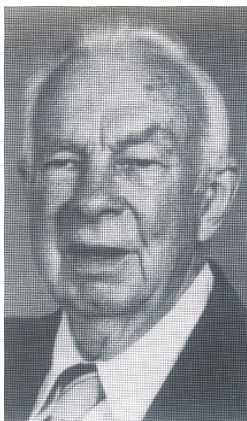
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### *The Vortex is 75 Years Old!*

This publication of the California Section of the American Chemical Society, *The Vortex*, began life in January, 1940, with Volume 1, Number 1. It was officially titled "The VORTEX, Bulletin of the California Section, American Chemical Society". According to the minutes of the December 14, 1939 meeting of the Section Executive Committee printed in the first issue, the



T. K. Cleveland, Editor 1940-1969

subject of a new publication was introduced by Chairman-Elect T. K. Cleveland to replace the printed meeting announcements the Section then used. Since the first issue was received by some in very early January, its first editor, the same T. K. Cleveland who became chair of the Section in 1940 must

have had the structure of the issue laid out much before its mention in the Executive Committee minutes in the middle of the previous December.

In the first issue, under the title "1940 and *The Vortex*", an explanation for the new publication is given:

"More than 38 years ago, a group of chemists met to form the California Section of the American Chemical Society. Every year since 1901 has been a milestone to its steady growth, and the initial membership list of 48 has swelled to a roster of over 600".

A few days ago, the midnight hour, in its westward course, marked the arrival of another year, man's infinitesimal unit of time. What does 1940 hold for the Section and its members? It is safe to predict that the former will continue to experience some measure of growth. Being no oracle, we cannot, like the poet, "gaze into the future" and foretell the progress of each individual, be it a new task, a problem solved, a crowning achievement, or just the normal contribution to an existence more or less routine.

The recording of events just past is relatively easy. To determine what of them shall best remain forgotten is a task not to be taken lightly. A vortex, by nature, gathers in all things entering its sphere of influence. This natural phenomenon seldom or never displays powers of discrimination towards the objects engulfed. We intend

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(Continued from page 2)  
the Nanoscience Community”.

The popular Kavli Foundation Lecture series continued on Monday afternoon, with the Emerging Leader lecture given by Dr. Theodore Betley of Harvard University on “Radical Frontiers in Catalysis” and the main Innovations in Chemistry lecture given by Dr. Laura Kiessling of the University of Wisconsin-Madison entitled “Us Versus Them: Distinguishing Humans from Microbes with Carbohydrate”.

All CAL-ACS Councilors and our two Past ACS Presidents were present at the Council meeting and participated on National ACS committees. Information on some of the activities of the committees to which they are affiliated can be found below.

The Denver Council meeting was a quiet and efficient one, except where financial issues were concerned. While the escalated member dues renewal rate to \$162 for 2016, per the bylaws, passed without dissension, there was a heated discussion regarding planned increases in future National meeting registration rates. The long range financial plan for meeting registration fees was unveiled and called for a \$15/year increase in fees through 2020, in addition to any inflation-based increases, in order for meeting fees to be able to fully cover the technical programming costs. This would make the Early Member Registration for 2016 National meetings increase to \$415. After many opposing comments, Council voted to ask the Board to delay these increases until additional background information could be presented to Council at the next meeting in Boston.

In other actions of note, Council voted to approve petitions to charter the India International Chemical Sciences Chapter and the Taiwan International Chemical Sciences Chapter. This adds to the current chapters in Hong Kong, Hungary, Malaysia, Romania, Saudi Arabia, Shanghai, South Africa, South Korea, and Thailand.

The Divisional Activities Committee (CCA) awarded ten new Innovative Project Grants were funded totaling \$54,000, with the maximum grant set at \$7500.

Community Affairs (CCA) turned out in force at the Denver Zoo for one of our

most successful public outreach events to date, assisted by volunteers from Cal State University Fresno, Colorado State University Fort Collins, the University of Colorado, Denver, Metropolitan State University of Denver, and the University of Puerto Rico, Rio Piedras. CCA member and Fresno Section Councilor Melissa Golden and the CSU Fresno Chem Club stole the show with Nick L. Mole, the giant mole who greeted visitors as they arrived at the Zoo.

As a newly appointed member of ACS President-Elect Donna Nelson’s Task Force on Jobs and Careers, she invites any input or suggestions to help members with jobs or careers. Please send any ideas or suggestions to [marindawu@gmail.com](mailto:marindawu@gmail.com).

Local Section Activities Committee (LSAC) awarded fifteen Innovative Project Grants were awarded for a total of \$38,389. It is expected that sixteen smaller grants with an overall total of \$4000 will be awarded for the Bridging the Gap Programs: Teachers of Chemistry K-12 Nano-Grants. Mini-grants will also be awarded to Local Sections who attended the 2015 Leadership Institute to encourage partnering activities between neighboring local sections.

#### **News you might use**

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

A Virtual Career Fair will be held in June for ACS members seeking employment. Check C&EN and the ACS website for more information in the coming month. Both an on-site and virtual career fair will be held at the Boston meeting in August.

Any members interested in the latest ACS financial performance can look at [www.acs.org](http://www.acs.org), click on the “About ACS” tab at the bottom and then “ACS Financial Information”.

ACS President Diane Schmidt is encouraging faculty from Ph.D. granting institutions to give ACS membership as an award for outstanding chemistry students and will match each gift by paying another student’s membership from her Presidential funds.

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### Interesting Statistics

More than 1900 people joined the American Association of Chemistry Teachers (AACT) launched by the ACS last year, of whom 88% are K-12 chemistry teachers. Dow Chemical Company has provided a gift of \$1 Million to become the sole Founding Partner of AACT.

Attendance at the Denver meeting as of Tuesday evening was 13,940, with 7307 regular attendees, 5141 students, 847 exhibitors, 360 Expo only registrants, and 285 guests. This is on par for a Spring meeting, although it represented a greater number of students.

The 2014 New Graduate Survey results show that the unemployment rate for new graduating chemists dropped from 14.9% in the 2013 survey to 12.4%, hopefully ending the three year decline in employment, although still much higher than traditional levels. Unemployment for experienced members dropped from 3.5% to 2.9%. Unfortunately, salaries have been flat.

The ACS Career Fair had 715 job seekers, 27 employers offering 85 positions, and 10 recruitment booths in the Expo. The Virtual Career Fair that was operated for members unable to attend the National meeting had 918 job seekers and 6 employers offering 38 positions. In conjunction with these

activities, as a benefit to members on site, 23 Career workshops were held, along with 368 resume reviews and 218 mock interviews. CAL-ACS members Bryan Balazs, Mark Frishberg, and Marinda Wu, who are ACS Career Consultants, actively participated in these offerings.

The Women Chemists Committee's fourth Annual WCC Rising Star Awards were given to ten early-to-mid-career women chemists and there were eight WCC/Eli Lilly Travel grants awarded. Merck is working with the WCC to develop a new research award to fund eight women graduate students to present their research at the upcoming Boston meeting in August.

The ACS Scholars program will celebrate its 20th anniversary in 2015. There have been 1500 graduates of the program. 200 having earned Ph.D. degrees and an additional 200 are currently in Ph.D. programs.

ACS membership had a slight decline in 2014. While approx. 24,000 new members were added, approx. 25,000 members did not renew their membership.

Submitted by Mark Frishberg, CAL-ACS Councilor, with input from our other Councilors and Past ACS Presidents (Complete report on the Section's website,



### *The Harry and Carol Mosher Award*

This award was established in 1980 by the Santa Clara Valley Section to:

1. recognize and encourage outstanding work in chemistry,
2. advance chemistry as a profession, and
3. recognize service to ACS.

The award is named for the late Dr. Harry S. Mosher of Stanford University, Palo Alto, California, and Carol W. Mosher of the Stanford Research Institute International, Menlo Park, California, husband and wife, charter members and long-time supporters of this Section. The award currently consists of an engraved plaque and a check for \$2000.

The first scientists to receive this award were Drs. Harry and Carol Mosher themselves in recognition of the inspiration of their example. The committee noted that the Moshers, including a brother, Dr. William A. Mosher, also a chemist and former Chairman of the Department of Chemistry at University of Delaware, are outstanding examples of the qualities to be recognized and honored by this award.

The deadline for nominations for 2015 is May 31, 2015. Write for complete details to [mosher\\_award@scvacs.org](mailto:mosher_award@scvacs.org) or visit [http://www.scvacs.org/Local\\_Folder/Awards.html#Mosher](http://www.scvacs.org/Local_Folder/Awards.html#Mosher)



## PROBLEMS WITH PRIONS (Part 3)

Bill Motzer

In Part 2 of this series (Vortex April 2015) the environmental transport/fate in soil, surface, and groundwater of prions were discussed. In this, the last part of the series, analysis and detection will be presented as well as concluding remarks on the entire three parts.

### ANALYSIS AND DETECTION

Previous detection and analysis was done by autopsy in humans and necropsy of animals, particularly microscopic examination of stained brain tissues. Currently, prion detection and analysis for tissues is primarily achieved by immunoblotting techniques including the Western blot protein immunoblot (Western blot), an analytical technique used to detect specific proteins in a given tissue sample or in homogenated extract. Western blot uses gel electrophoresis to separate native or denatured proteins by the length of the polypeptide under denaturing conditions or by analyzing the protein's 3-D structure using native and non-denaturing conditions. Proteins are then transferred to a membrane, typically nitrocellulose or polyvinylidene fluoride (PVDF)—a highly non-reactive and pure thermoplastic fluoropolymer—where they are probed or detected using antibodies specific to the target protein. Specific prion strains can be identified.

Other related techniques include using antibodies to detect proteins in tissues and cells by immunostaining and an enzyme-linked immunosorbent assay which are rapid and convenient methods with detection limits of 4 and 0.5 ng per 20  $\mu$ L. Additional analytical methods include brain homogenate, ultraviolet spectroscopy, liquid

chromatography-tandem mass spectrometry (LC-MS/MS). More rapid techniques involving cell panel assays and cell-free conversion assays have been developed for prion strain identification.

### CONCLUSIONS

Transport and fate of environmental prions is currently not well understood. However, although they are not specific chemical compounds per se, prions appear to exhibit characteristics of emerging contaminant of concern (ECC) in that they are believed to be extremely toxic, causing chronic degenerative neurological diseases in humans and animals.

They are also persistent and may remain as infectious agents in soil for many years and possibly could be transported by contaminated surface water ultimately impacting shallow groundwater, and perhaps even deeper groundwater, particularly where clay aquitards are absent. Once in soil and water, they are recalcitrant and may be difficult to extract and destroy.

Therefore, prions should be considered as potential (ECC), particularly in areas that could potentially host large infected animal populations in industrial animal production facilities such as feedlots and stockyards. Other potential sources include wastewater and biosolids, through effluent from slaughterhouses unknowingly rendering prion-contaminated carcasses or through contaminated effluent from hospital or research facilities. Of particular concern is that prion risk assessments of contaminated soil and groundwater are not well established and would require a rapid analytical technique, particularly in soil and water.

### ACKNOWLEDGMENTS

For the 2015 revision paper, I appreciated the initial review by Dr. Iris Priestaf, Todd Groundwater (who first suggested the topic). Figures were drafted by Mr. Alain Boutefeu, Senior Cartographer, Todd Groundwater.



(continued from page 3)

that *The Vortex* of the California Section shall draw unto itself all matters of vital interest to chemists individually and to their organization. Its behavior and pattern will be influenced by human elements. It shall concern itself not only with chemists' accomplishments but with their hopes, their aspirations, perchance their shortcomings.

*The Vortex* should be a personal thing; should reflect the personality of its parent section. Members, this is your child. Its development shall be as you direct. With glasses raised, let your toasts to 1940 include: "Here's to *The Vortex*, may it enjoy long life, steady growth, and perpetual vitality."

Ted Cleveland guided *The Vortex* as editor for its first 29 years. He set its basic style as a roughly 8.5" by 5.5" bulletin with a slightly heavier stock cover. The cover was usually a changing monotone color with black and white printing or photos. The issues had meeting notices, Section Executive Committee Minutes, a Directory of the Section officers and committees, articles on previously held meetings, and columns. There were advertisements from both local and national companies related to the chemical enterprise and therefore useful for members from the start.

Short articles on a chemical science subject began appearing in the second issue of *The Vortex*. Beginning with the fourth issue in April, 1940, Cleveland filled small spaces with jokes, many of them "groaners". For example, "English Prof: What do you know about H. G. Wells? Chem Freshman: Isn't that where they get mercury?"

Starting in 1942, the June issue of *The Vortex* contained a directory of the Members of the Section, about 870, in addition to the usual items. The Associate Members, about 39, were listed in the September 1942 issue.

Ted Cleveland served as Section Chair in 1940 and 1965 while the editor. In September, 1969, he turned *The Vortex* over to Robert Matteson whose name had appeared as Associate Editor in the masthead as early as in May, 1941. In his "Swan Song" Cleveland thanked many of the Section members who had had a hand in making *The Vortex* the fine publication

it became, and still is. Dorothy Folger was Assistant Editor from the beginning with her name appearing in the masthead starting with the April, 1950, issue. Many members helped in the proof reading, column writing, book



Bob Matteson,  
Editor 1947-1972

review writing, and reporting. Bill Eisenlord was acknowledged for his cover photographs and Bill served as the Section's photographer for many years after.

Bob Matteson continued *The Vortex* essentially as he received it from Cleveland. He had served as Section Chair in 1947. The issues were usually 32 pages in length and the page numbering continued throughout the yearly volume. Bill West continued as Associate Editor.

In May, 1972, William Stanley became the third editor of *The Vortex*. By this time the covers of the issues were still glossy paper, but in black

and white. Meeting notices for the Santa Clara Valley Section, which had been formed in 1954, continued to be listed each month as were the meetings of the Fresno Subsection, which became the San Joaquin Valley Section in 1984, and the Sacramento Section. Some issues listed the meetings of Sierra Nevada Section (western Nevada) also.



William Stanley,  
Editor 1972-1976

The leadership of *The Vortex* was passed on to Robert Grinstead in April, 1976. A

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special issue of *The Vortex* was published



Robert Grinstead,  
Editor 1976-1994

in September, 1976 to celebrate the 172<sup>nd</sup> ACS National Meeting in San Francisco. This was also the centennial of the ACS and the 75th anniversary of the California Section. This issue of *The Vortex* was provided to attendees of the National Meeting and included information about San Francisco and northern California useful for visitors. There was a very informative article about the history of the California Section in the issue.

All the editors of *The Vortex* had kept an eye on the cost of publishing the bulletin, but during the '70s and '80s, this became an important issue of concern. The nature of the chemical enterprise in northern California was changing. Old established laboratories like Shell Development in Emeryville moved out of the area. Other existing firms were sold or merged and left the area of the Section. Advertisers were becoming harder to attract to a small circulation bulletin, even if it targeted a specific, interested audience. The physical makeup of *The Vortex* changed from covers of different, more expensive, paper to the same paper as the body of the issues. Page counts were reduced also. The combined thickness of the issues of the three years of 1974 to 1976 (volumes 35 to 37) are about 1.50 inches (3.8 cm). The issues of the three years of 1993 to 1995 (volumes 54 to 56) are about 1.125 inches (2.8 cm) thick.

In April, 1994, Grinstead passed the editorship on to Louis Rigali, the current editor of *The Vortex*. Rigali has kept the high quality of the bulletin going in the face of pressure to reduce its cost in a number of ways. The first editors were also the business

managers of *The Vortex*. Rigali engaged a professional business/advertising manager who obtained additional advertising from sources outside the Section. He searched for more cost effective ways to print and mail the issues to the membership. Finally, as costs in the new century rose, Rigali oversaw the conversion of *The Vortex* to an online bulletin, reducing its cost and carbon footprint to a great extent and freeing funds

to be used for other California Section purposes. The online format allows the number of pages to be increased as more content is available with little increase in cost. It also



Lou Rigali, Editor 1994-

makes the archives of past issues available to members without the need for shelf space.

ACS local sections are required to send to each of their members any published meeting notices they may make. *The Vortex* has been much more than just a meeting notice bulletin for its whole existence. It has informed California Section members of scientific matters of interest, information on the governance of the Section, insightful columns on employment, history, safety, etc., and opportunities to get involved in activities that are educational and generally fun for chemists and engineers. Its high quality is impressive when compared to the publications of other ACS local sections. It continues to keep true to the vision of the first editor, Ted Cleveland, as a first class publication to serve the needs of the California Section members.





## FAMILY SCIENCE NIGHT

Alex Madonik

The California Section's volunteers have taken Family Science Night to over twenty middle schools in five different Bay Area counties, but the reception was never warmer than on Thursday, 12 March 2015, at John Muir Middle School in San Leandro. Liz Miller, Science Department Head, planned meticulously for this event, and recruited wonderful volunteer teams from CSU East Bay (in Hayward) and San Lorenzo's Arroyo High School. John Muir's teachers encouraged student participation, and 350 of them showed up (with their families) to claim their bilingual (English and Spanish) programs, printed on colorful thermochromic paper. Section Chair Charlie Gluchowski and Chemistry Ambassador par excellence Jeanne Pimentel joined John Muir Assistant Principal Jorge Gonzalez in welcoming families as they arrived for the opening show in the cafeteria, where the Scientific Jam Band showed that the scientific method still rocks.

Assisted by high school senior Raymond Souza, Bryan Balazs (LLNL) was back with his favorite chemical demonstrations, including Disappearing Water, Elephant's Toothpaste, Giant Flame in a Bottle, and the Acrylic-Oxygen Rocket. The vacuum pull baffled two of John Muir's strongest students. Then, it was time for the hands-on activities, with a musical send off and plenty of dancing by the John Muir snack crew.

Our volunteers were waiting at a dozen stations that filled the science hallway. In room D1, Stephanie Malone and Sam Hu guided visitors as they explored the six numbered plastics (as well as compostable PLA) used in packaging, identifying mystery samples by density, melting point, and resistance to solvents. Across the hall in D2, Janet Schunk introduced kids to DNA/RNA base pairing, while Brian Adzima and Eva (a CSU volunteer) revealed the secrets of UV-color-changing beads. In D3, a rapt audience watched as Kent Campbell (Dow) showed how chemical changes can create beautiful crystals, rigid foam sombreros and noisy explosions.

Room D5 was devoted to the ancient chemistry of ink, made by combining oak

gall tea with colorless iron sulfate. James Gardner showed students how to letter their own certificates using quill pens. Across the hall in D7, modern polymer chemistry was the theme as visitors made slime with help from a team of Chevron research scientists. Chevron provided the materials as well as the extra safety glasses that we encouraged everyone to wear while trying the "wet" chemistry activities in other classrooms. Safety is the most important lesson we can teach a future scientist.

Room D9 (Ms. Miller's classroom) was devoted to a pH Workshop, where kids learned about the acid and base properties of a dozen familiar substances ranging from lemon juice and vinegar to baking soda and laundry soap. Joe Drumm helped the CSU volunteers set up the workshop, and then presented Colorful Electrolysis, in which students find out what happens when an electrical current from a 9V battery passes through a solution of Epsom Salts that contains red cabbage juice as a pH indicator. The dramatic color changes at the electrodes confirm that chemistry is happening!

More color changes were on display in D8, where Lena Trotochaud (LBNL) used the same red cabbage juice indicator to test the pH of the gases captured when a candle burns inside a bottle. Students also discovered that they exhale the same gas – carbon dioxide – so their breath causes the same color change, from blue to purple to pink. We've all heard that carbon dioxide is a greenhouse gas, and UC Berkeley gradu-



*(continued on page 10)*

## Chair's Message

April has been a busy month for our Section! Alex Madonik participated in early Earth Day activities by speaking about CO<sub>2</sub> levels and ocean acidification at Point Molate in Richmond on April 13. Our activities



at the John Muir National Historic Site in Martinez on Earth Day, April 18, was well received by members and visitors alike. Also on the 18<sup>th</sup> we joined our Santa Clara Valley colleagues in running the local Chemistry Olympiad exam to select candidates for the United States National Olympiad team. During April, we also convened our first meetings of the Long Term Planning Committee (LTPC) co-chaired by Lou Rigali and Mark Frishberg to address critical challenges for the Section during the next 3-5 years. If you have any suggestions please contact Lou, Mark or me.

The Women Chemists Committee (WCC) has a great event planned for May 2. In addition, our new Younger Chemists Committee (YCC) Chair, Stephanie Malone is planning an event for mid-May as well.

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*(Family Science continued from page 9)*

ate student Alexis Shusterman was there to present her poster on the BEACON project for community carbon dioxide monitoring. Stay tuned for more about climate science – it's the theme of this year's ACS Earth Day celebration.

Arroyo High School volunteers were busy in several classrooms, and they took charge of Plant Scents and Molecular Models in room D10, challenging visitors to identify



Family Science Night at John Muir Middle School © March 2015 © Charles Glaucoff

Please check [www.calacs.org](http://www.calacs.org) for details on these events the link to YCC Facebook.

We will have our annual awards luncheon at Scott's Seafood in Walnut Creek on June 6 to recognize various Section awardees as well as our 50, 60, and 70 year ACS members. We are delighted that Dr. Marinda Wu, former president of the national ACS and California Section member, will give a keynote presentation during the luncheon.

The continuing challenge that California faces regarding water for residential and agricultural use continues in this the 4th successive year of drought. What can we chemists do about this challenge? Our June 10<sup>th</sup> Section meeting will take place at Chevron in Richmond, California. Section member Dr. David Sedlak, Malozemoff Professor in the Department of Civil & Environmental Engineering at UC Berkeley, will give a talk on "Is There Room for a Chemist at the Fourth Revolution in Urban Water?"

As noted previously, we will be breaking with tradition and will be having section meetings in July and August this year. Stay tuned for details and visit [www.CalACS.org](http://www.CalACS.org)



"mystery" plant extracts such as vinegar, lemon, rosemary, and vanilla, and then to choose their favorite and learn what chemical compounds are the source of each aroma. They could then use plastic model kits to construct molecular models of these compounds. This was a challenging assignment for the Arroyo chemistry students, and they were up to it!

When the kids were done collecting activity stamps on their programs, they headed back to the cafeteria to claim their extra credits, their ACS souvenirs, and Liquid Nitrogen Ice Cream, prepared and served by volunteers from UC Berkeley's Alpha Chi Sigma fraternity. Everyone appeared to be in great spirits as we packed up, and I want to close with warm thanks to our volunteers, the John Muir staff, and everyone else who pitched in to make this event a success.



# BUSINESS DIRECTORY

## RECRUITING WEB SITE LISTING DIRECT TO YOUR SITE

There are two important ways to recruit through our services. One is to place a print ad in the Vortex. The other is to place a web site ad reaching out to 40,000 ACS members. We recommend using both low cost methods.

You can view both of these opportunities by going to the link below. Who uses these options?

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