

# Silicon Valley Chemist

Santa Clara Valley Section

American Chemical Society

Volume 35 No. 2

## FEBRUARY 2013 NEWSLETTER TOPICS

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## March 21st Dinner Meeting Carbon for Water

A film by Evan Abramson and Carmen Elsa Lopez

More than one-sixth of the world's population lacks access to safe drinking water and 3900 children die from water-borne diseases daily. In recognition of this, the American Chemical Society launched Pennies for PUR Water for the International Year of Chemistry 2011. This program provided funding for a 3.5-cents sachet that can safely treat 2.5 gallons of water. The movie "Carbon for Water" presents a similar program found in Kenya where a for-profit company aims to provide 900,000 water filters to villagers to reduce the practice of boiling water via burning wood. These filters will decrease the deforestation and the time women and girls walk every day to collect wood. The reduction in wood burning will reduce CO<sub>2</sub> emissions. The company can sell this CO<sub>2</sub> credit on the voluntary open market. "Carbon for Water" is a 22-minute film that describes how the company distributes the filters and the effect on

the local community. The film is directed and produced by Evan Abramson and Carmen Elsa Lopez ([www.carbonforwaterfilm.com](http://www.carbonforwaterfilm.com)).

This documentary was shown at the last ACS National Meeting in Philadelphia as part of the Committee on Environmental Chemistry project. Bring a bag of popcorn, watch the movie, and join in the discussion.



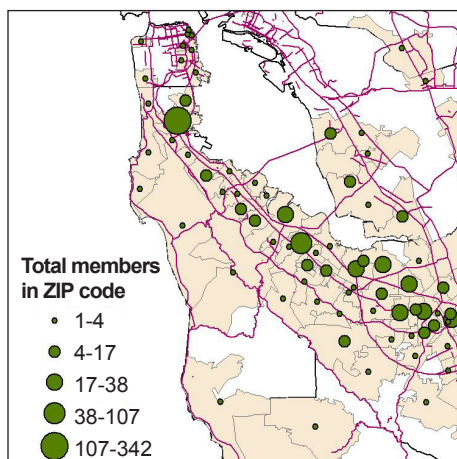
## Chair's Message

### Where We Cluster



Among my goals for this year is to bring meetings to the membership. This is possible, even easy, when you look at the membership by work address. To be sure, only about half of our members provide a "work address," but still, that's enough to get some really useful results.

Thanks to the efforts of Ean Warren (2013 Chair-elect) we can view our membership clustered by work address. It's really interesting! Take a look at the map at right. If you think about it, there are no big surprises here. Look at the large circles (clusters)



in South San Francisco. Can you recognize your work place? We have hundreds of

*continued on next page*

## March Dinner Meeting

**Date:** Thursday March 21, 2013

**Time:** 6:00 p.m. Social Hour

7:00 p.m. Dinner

8:00 p.m. Movie Presentation

**Presentation:** "Carbon for Water"  
A film by Evan Abramson and Carmen Elsa Lopez

**Location:** Biltmore Hotel & Suites  
2151 Laurelwood Road  
Santa Clara, CA

**Cost:** \$26.00  
Teriyaki Steak or Vegetarian Crepes

**Reservations:** [www.scvacs.org](http://www.scvacs.org)  
Lois Durham, 650-322-3507

Reservations should be made by March 18th stating your name, address, company/school affiliation, and dinner selection. If you are unable to honor your reservation, please cancel by March 20th.

*Chair's Message, continued from front page*

members working in South San Francisco. Look at the peninsula. See where you work? We have dozens of members working in many different locations.

Like all chemists we make decisions best if we have data. Now we have data and it's time for decisions. Find your work place. Volunteer to help our local section meet there or very nearby. We can even combine clusters to get bigger meetings. You can coordinate the local site arrangements. Contact me with your ideas. Why travel to a distant location for a meeting? It could be just a short walk from your office or lab.

This month is the presentation of the annual Harry and Carol Mosher Award. This is one of the SCV awards that recognize achievement. The recipients typically give a presentation on their research work as the main part of the program. Join us on February 28, 2103 (the fourth Thursday), for dinner, networking and a chance to meet and honor Martha and Charles Casey from the University of Wisconsin, Madison.

*Happy  
Valentine's  
Day*



## CALL for NOMINATIONS Shirley B. Radding Award

The Santa Clara Valley Section of the American Chemical Society (ACS) announces the call for nominations for the 2013 Shirley B. Radding Award.

First awarded in 1994 to its namesake, the Shirley B. Radding Award annually honors someone who has been a member of the ACS for at least 20 years. Nominees must have demonstrated dedicated, unselfish leadership, service and significant contributions over a sustained period of time to industrial, applied or academic chemistry and to the ACS through elected or appointed positions at local, district and national levels.

### Award Criteria

- Member of the American Chemical Society for more than twenty (20) years.
- Demonstrated dedicated and unselfish service to ACS and its members over a sustained period of time.
- Provided leadership through elected and appointed ACS positions at local, district and national levels.
- Made significant contributions to industrial, applied or academic chemistry.

### Previous Award Recipients

1994 Shirley B. Radding (deceased)	1995 Agnes Ann Green (deceased)
1996 John F. "Jack" Riley (deceased)	1997 Howard M. Peters
1998 Alan C. Nixon (deceased)	1999 Valerie J. Kuck
2000 Halley A. Merrell	2001 Norman A. LeBel (deceased)
2002 Paul H. L. Walter	2003 Jean'ne M. Shreeve
2004 Maureen G. Chan	2005 Glenn Fuller (deceased)
2006 Janan M. Hayes	2007 Merle I. Eiss
2008 Dorothy J. Phillips	2009 Bryan Balazs
2010 Herbert B. Silber	2011 Carol A. Duane
2012 Bonnie Charpentier	

The award consists of an honorarium of \$1,000 and a suitably inscribed memento. Nominations must consist of at least one letter of nomination stating how the nominee's work relates to all aspects of the award. It is strongly recommended that seconding letters accompany the nomination.

Nominations are due on or before May 1, 2013, and may be sent electronically to [Radding-Award@scvacs.org](mailto:Radding-Award@scvacs.org) or be mailed to:

Radding Award Committee  
Santa Clara Valley Section ACS  
Post Office Box 395  
Palo Alto, CA 94302-0395

## Deadline to Apply for the 2013 ACS GREET Program is March 6th

GREET (Global Research Experiences, Exchanges and Training Program) aims to provide intensive, high impact international research experience and collaboration opportunities to U.S. early- to mid-career researcher mentor and mentee teams. Research teams are asked to establish new international collaborations with a host academic, industrial, or institutional partner of their choosing and travel to their site for a research, training, outreach, or educational experience. Teams are asked to consider how to engage the community at their home institution upon

their return and also consider how to continue their new collaboration with their host institution/laboratory.

Mentees are to spend 4-8 weeks engaged in the project at the foreign laboratory, with their mentor participating for a concurrent 2-3 week period. The GREET program is intended to foster scientific networking, increase scientific skills, increase global scientific and collaborative experience, and provide a wonderful mentoring experience.

Up to \$11,000 will be awarded to at least 5 teams in 2013 to provide for: interna-

tional travel expenses, a stipend for living expenses while abroad, pre-departure language training, medical and accident insurance, visa costs, and additional travel expenses to present the results at the 247th ACS National Meeting & Exposition in Dallas, TX from March 16-20, 2014.

The deadline to apply for the 2013 GREET Program is 23:59:59 EDT on March 6, 2013. Applications are now being accepted.

For more information about how to apply, please visit: [www.acs.org/greet](http://www.acs.org/greet).

Reminder

February Dinner Meeting

Reminder

## 2012 Mosher Award to Doctors Charles and Martha Casey

### Abstract

Martha and Chuck Casey will describe how their chemistry experiences had common origins in undergraduate research and in joining the research groups of beginning professors in graduate school at MIT. Chuck's career followed a traditional path as a Professor at the University of Wisconsin. He will describe his research career in organometallic chemistry and his experiences in teaching both graduate and undergraduate students. Martha switched to university administration, and will describe some of the ways her chemistry background helped her as an Assistant Vice Chancellor in charge of academic planning and institutional research.

Chuck and Martha have shared a strong interest in ACS activities. Martha became active first, was elected secretary-treasurer of the Wisconsin Section in 1975, Chair in 1980, and a Councilor in 1982. She has served on national committees ranging from the Committee on Budget and Finance to the Women Chemists Committee. Chuck was Chair of the Wisconsin Section in 1985, and later served as chair of the Organometallic Chemistry Subsection and the Inorganic Division of ACS. With Martha acting as a savvy campaign manager, he successfully ran for 2004 ACS President. He is proud of starting the Academic Employment Initiative and for efforts that led to open disclosure of ACS Executive Compensation.

Since retirement, Martha and Chuck's activities have re-converged and now center on service to scientific, civic and university organizations. Chuck chaired the National Research Council Committee that wrote the 2007 report "The Future of U.S. Chemistry Research: Benchmarks and Challenges"; he also served as chair of the Chemistry Section of AAAS during the International Year of Chemistry. Martha currently serves on the national ACS Nominations and Elections Committee, and needs suggestions for ACS presidential candidates. She continues to seek ways the local ACS section can best serve the chemical community, especially the students. In Madison, she serves on many boards including Madison Symphony Orchestra,



Opera for the Young, Downtown Rotary, and the UW-Madison Alumni Association.

### Biographies

Charles Casey is Homer B. Adkins Emeritus Professor of Chemistry at the University of Wisconsin-Madison. He received a B.S. in Chem. from St. Louis University and a Ph.D.

from MIT. In 1968, he joined the faculty at the University of Wisconsin-Madison where he spent his entire academic career and served as Chair of Chemistry from 1998-2001. He served as President of the American Chemical Society in 2004. His research focused on mechanistic organometallic chemistry and explored mechanisms of important catalytic processes including hydroformylation, hydrogenation, and alkene polymerization. He chaired the National Research Council Panel that wrote the 2007 report: "The Future of U.S. Chemistry Research: Benchmarks and Challenges." He is a member of the National Academy of Sciences (1993) and has received ACS Awards in Organometallic Chemistry (1991) and for Distinguished Service to Inorganic Chemistry (2011).

Martha Casey received her A.B. degree from Bryn Mawr College and her Ph.D. in organic chemistry from the Massachusetts Institute of Technology. She did postdoctoral work at the University of Wisconsin-Madison. After six years as a research chemist at UW-Madison, she switched to a career in university administration. She completed her service as an Assistant Vice Chancellor and head of the Academic Planning and Analysis Office, an arm of the Provost's Office. This office developed academic planning and institutional research at the

University of Wisconsin-Madison. In particular, she pioneered developing truly comparable comparisons with peer universities.

Martha was elected a Fellow of the American Chemical Society in 2012. She currently serves on the ACS national Committee on

Nominations and Elections. As Councilor for the Wisconsin Section of the ACS for 28 years, she previously served on the Council Policy Committee, the Budget and Finance Committee, the Committee on Economic and Professional Affairs, and the Women Chemists Committee. At the local level, she has served as chair of the Wisconsin Section and secretary-treasurer. She is particularly proud of helping to transform the mission of the Wisconsin Section toward student-oriented activities. She also serves on a number of boards in Madison related to supporting classical music and opera in the community and to supporting the university.

## February Dinner Meeting

**Date:** Thursday, February 28, 2013

**Time:** 6:00 p.m. Social Hour  
7:00 p.m. Dinner  
8:00 p.m. Presentation

**Speakers:** Charles and Martha Casey  
2012 Mosher Award Winners

**Location:** Biltmore Hotel & Suites  
2151 Laurelwood Road  
Santa Clara, CA

**Cost:** \$26.00  
Grilled Salmon or Pasta Primavera

**Reservations:** [www.scvacs.org](http://www.scvacs.org)  
Lois Durham, 650-322-3507

Reservations should be made by February 25th stating your name, address, company/school affiliation, and dinner selection. If you are unable to honor your reservation, please cancel by February 27th.



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# Moisture-Triggered Motions Of New Material Harnessed to Generate Electrical Power

Lauren K. Wolf (C&E News Online)

Scientists have long struggled to design sustainable batteries and sensors that power themselves via natural stimuli such as light, heat, and even the motion of walking. Now, researchers have developed a material that harvests energy from tumbling motions triggered by a ubiquitous environmental source: water vapor (Science, DOI: 10.1126/science.1230262).

The polymeric material requires only a tiny amount of water vapor to generate power, says postdoc Mingming Ma, a member of the MIT team led by Robert S. Langer that developed the substance. Even the moisture on your skin is sufficient, Ma says. "You can put it on your hand, and it will work."

The MIT researchers didn't initially set out to develop an energy-harvesting substance, Ma tells C&EN. Instead, they were working toward a strong, flexible polymer for use in organic electrodes. "But when we

saw how water-responsive it was," Ma explains, "we switched directions."

The substance is a composite made of a rigid polypyrrole matrix and a soft polyol-borate gel. When the material absorbs moisture, water molecules disrupt hydrogen bonds between its polypyrrole and polyol components, and the composite swells.

That swelling comes in handy when the material is placed in a water-vapor gradient like the one on a moist surface: A 30- $\mu\text{m}$ -thick sheet of the composite rapidly curls up and then flips over continually like it's performing a gymnastics routine. When the sheet flips over, it expels water molecules from the side exposed to the ambient air and sucks them in from the side lying against the water-covered surface, repeating the tumbling cycle.

Rather than making a material that responds to time-varying stimuli, as has been done in the past, "Langer's team has devised

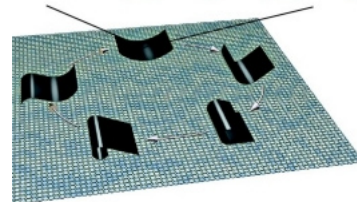
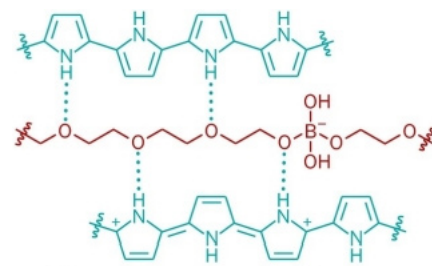
a simple and elegant means to harness a constant environmental condition to drive motion," says polymer scientist Ryan C. Hayward of the University of Massachusetts, Amherst.

To convert the mechanical energy generated by the material's rapid movements into power, the MIT team stuck a piezoelectric film—which transforms mechanical force into electrical charge—to one side of the polymer sheet. The researchers then attached the whole assembly to an electrical circuit.

A 6- by 3-cm patch of the material generated some 5.6 nW of electrical power on average. That's orders of magnitude less than the power density created by a cell-phone battery, Ma says.

In a commentary associated with the new report in Science, engineers Hyoki Kim and Sunghoon Kwon of Seoul National University say that this paltry power output might limit the material's usefulness. But, they add, "it should be possible to increase the power output in a straightforward way by stacking multiple devices."

Ma agrees, adding that he and the MIT team are also now developing a more efficient piezoelectric material to harness the composite's mechanical energy. The researchers have submitted a patent application for the new substance.



A new composite of polypyrrole (blue) and polyol-borate (red) tumbles as it absorbs and expels water vapor from a moist surface. Credit: Courtesy of Ning Zhang

## Welcome to the Santa Clara Valley Section of ACS

Each month the section receives a spreadsheet from national ACS with the names of members new to our section. The members are either new to ACS, have transferred in from other areas, or are the newest members -- students. To welcome you to the section and get to know you, the Executive Committee offers new members a free dinner!! To encourage you to attend a monthly section dinner meeting, we would like you to be our guest. When you register, make certain to mention that you are a new member and you and a spouse (or friend) will be our

guests. The dinner meetings are often the 3rd Thursday of the month at a local spot, somewhat convenient to the entire section. If you are unable to attend in the evening, perhaps you would join us for an outreach event, like judging a science fair, participating in the Chemistry Olympiad, or a National Chemistry Week event in October. Then, there is our annual wine tasting and awards picnic in July. The local section is a volunteer organization. Please attend an event, volunteer to help, and get to know your local fellow chemists. Welcome!!

### New Members List for January

Dr. Aziz Aid	Dr. Shishir D. Gadam	Habiba Kausar Naqvi
Dr. David L. Anton	Dr. Nolan Griggs	Brad Andrew Palanski
Liang Bao	Michelle Huynh	Chong Park
Dr. Richard J. Black	Dr. Indira Jayaweera	Mia Pulos
Nick Brockman	Bianca Khishaveh	Hayley Raquer
Celia N. Dudley	Pavel Klier	Dr. Longcheng Wang
Tim Dummer	Nian Liu	Dr. Dahlia Weiss
Robert John Ely	Dr. Thomas Markland	Elizabeth Wille
Dr. James Alan Fair	Juliana Moreno	

# Local Science Fairs in 2013

Contact: Susan Oldham-Fritts, [sofritts@garlic.com](mailto:sofritts@garlic.com), or Mark Kent, [marklent@yahoo.com](mailto:marklent@yahoo.com)

While you may have missed the wonderful opportunity to judge at the February 9th SCIENCEPALOOZA (see [www.outreach-foundation.org/judges.html](http://www.outreach-foundation.org/judges.html) if you are reading this before February 8), SCV-ACS still needs volunteers for our Synopsys Championship special awards judging team, and the following fairs still need category judges:

## San Mateo County Science, Math and Technology Fair

**Date:** Tuesday, February 26, 2013

**Location:** Hiller Aviation Museum, San Carlos

Contact Janet Shi at [jshi@smcoe.k12.ca.us](mailto:jshi@smcoe.k12.ca.us) or (650) 802-5355

For more information, [www.usc.edu/CSSF/Fairs/400.html](http://www.usc.edu/CSSF/Fairs/400.html)

## Monterey County Science and Engineering Fair

Sixth through twelfth grade Monterey County students

**Date:** Saturday, March 9, 2013

**Location:** California State University, Monterey Bay

For more information, visit [www.montereycountysciencefair.com](http://www.montereycountysciencefair.com)

## Santa Cruz Science Fair

Sixth through twelfth grade Santa Cruz County students

**Date:** Saturday, March 9, 2013

**Location:** Santa Cruz County Fairgrounds, Santa Cruz

For more information, visit [www.science.santacruz.k12.ca.us](http://www.science.santacruz.k12.ca.us)  
**Synopsys Championship** (aka Santa Clara Valley Science and Engineering Fair)

**Date:** Wednesday, March 13, 2013

**Location:** San Jose Convention Center, San Jose

For information on category award judging, visit

[www.outreach-foundation.org/judges.html](http://www.outreach-foundation.org/judges.html)

For information on participating in the SCV-ACS special awards judging team, contact Susan Oldham-Fritts, [sofritts@garlic.com](mailto:sofritts@garlic.com), or Mark Kent, [marklent@yahoo.com](mailto:marklent@yahoo.com)

## San Francisco Bay Area Science Fair - ISEF affiliate

While San Mateo County students are eligible, they will not be able to qualify for the California State Science Fair (CSSF).

**Date:** Wednesday, March 20, 2013

**Location:** San Francisco County Fair Ground Building - Golden Gate Park

Contact Robert Fabini at [sbasf@gmail.com](mailto:sbasf@gmail.com)

[www.usc.edu/CSSF/Fairs/300.html](http://www.usc.edu/CSSF/Fairs/300.html)

So, no matter which is your local science fair, please volunteer. See you at the fair!

## Highlights of the January Dinner Meeting, January 17th

Photos Courtesy of Lois Durham



Peter Rusch, Alice Brooks and Bettina Chen



George Lechner, Peter Rusch and Jim McClure



Lee Latimer and Bonnie Charpentier



Ashley Piekarsky and Abby Kennedy



Mark Kent and George Lechner



Floyd and Nancy Hobbs



SANTA CLARA VALLEY SECTION  
AMERICAN CHEMICAL SOCIETY  
P.O. Box 395, Palo Alto, CA 94302

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## SANTA CLARA VALLEY SECTION

<b>2013 Section Officers</b>	Chair	Peter Rusch (chair@scvacs.org)
	Chair Elect	Ean Warren
	Past Chair	Natalie McClure
	Secretary	Karl Marhenke
	Treasurer	Ihab Darwish

<b>Councilors</b>	2011-2013	George Lechner
	2011-2013	Herb Silber
	2012-2014	Abby Kennedy
	2012-2014	Ean Warren
	2013-2015	Linda Brunauer
	2013-2015	Sally Peters
	2013-2015	Peter Rusch

<b>Alternate Councilors</b>	2011-2013	Mark Kent
	2011-2013	Harry Ungar
	2012-2014	Lisa Milstein
	2012-2014	David Parker
	2013-2015	Stephanie Bachmann
	2013-2015	Lois Durham
	2013-2015	Natalie McClure

**Newsletter Editor** Nathaniel Zuckerman  
nathanielzuckerman@gmail.com

**ChemPloyment Abstracts** Director Liang Cao

## FUTURE MEETINGS

- Feb 28** Mosher Award Dinner Meeting  
Doctors Charles and Martha Casey  
University of Wisconsin  
Biltmore Hotel & Suites  
Santa Clara, CA
- Mar 1-29** Chemistry Olympiad Local Exam  
Participating SCV High Schools
- Mar 17-21** Pittcon  
Philadelphia, PA  
<http://pittcon.org>
- Mar 21** Santa Clara Valley Section Meeting  
Movie Presentation, A film by Evan  
Abramson and Carmen Elsa Lopez  
Carbon for Water  
Biltmore Hotel & Suites  
Santa Clara, CA
- Apr 1, 3** 18th Annual John Stauffer Lectures  
Stanford University  
Chemistry Department  
[http://chemistry.stanford.edu/stauffer\\_lectures](http://chemistry.stanford.edu/stauffer_lectures)
- Apr 7-11** 145th National ACS Meeting  
New Orleans, LA  
[www.acs.org/neworleans2013](http://www.acs.org/neworleans2013)
- Apr 13** Chemistry Olympiad National Exam  
Santa Clara University