

Silicon Valley Chemist

Santa Clara Valley Section

American Chemical Society

Volume 38 No. 7

JULY 2016 NEWSLETTER TOPICS

- 2016 Shirley B. Radding Award Recipient
- Connect with Chemists
- Chair's Message
- SCVACS Annual Wine Tasting, Family Picnic and Awards Ceremony
- The 2016 National Inventors Hall of Fame
- Demographic Survey of the Santa Clara Valley ACS Membership
- The Commercialization of Radiation Chemistry
- Revamped US Chemical Rules Signed into Law
- Chemistry Quiz
- New Bipartisan Congressional Chemistry Caucus
- Replacing the World's Most Destructive Industry
- New Members for May

Connect with Chemists

Meet fellow local chemists for an early morning coffee.

Look for Ean at a table with molecular models.

Thursday, July 14, 2016, at 7 a.m.

Coupa Café, 538 Ramona Street, Palo Alto
(a half a block off from University Avenue)

SCVACS By The Numbers

2673

Total members
of SCVACS

% of section members
are male. 20% female.
21% did not respond.

59

14.5

Percent of stu-
dent members

Percent of respondents who
identify chemist/scientist as
profession, most popular category

25

Read the article by Nicole Bouley Ford for more.

2016 Shirley B. Radding Award Recipient

Sally Peters

2016 Shirley B. Radding Award recipient, Sally Peters has been an ACS member for over 35 years and an active Santa Clara Valley section member for 25 of those years, thanks to Shirley Radding who encouraged her to become involved. Her undergraduate chemistry degree is from Geneva College in Beaver Falls, PA, and her MLS is from San Jose State University. Some of her early professional positions were as a research assistant in the Stanford University Chemistry Department, growing tobacco for mosaic virus work, and later in the Swain Chemistry library. Beginning in 1983, she worked in the Information Center at the Xerox Palo Alto Research Center doing literature and patent searching, retiring after 28 years.



Her service to the national ACS includes over 20 years as a counselor. During that time, she served on several committees including Meetings & Expositions, Local Section Activities and Community Outreach. Through her efforts, the Meetings & Expositions committee decided to

take the national meeting to Indianapolis, IN, in 2013. She was chair of our section in 2001 and has chaired the committee that oversees the Chemistry Olympiad for more than 15 years and headed the hospitality group. Following in Shirley Radding's footsteps, she has welcomed new members to the section and monthly provided cookies for our hungry officers for over 20 years!



Chair's Message

Jane Frommer and Ean Warren



Our Santa Clara Valley ACS section's summer event is termed a "picnic" but it is quite a bit more. Indeed, it has all the trappings of a picnic with a barbecue feast on the plaza in front of the Stanford Mudd Chemistry building. This part of the day is particularly family-friendly with children eating and playing outdoors while their families enjoy socializing.

Another phase of the Saturday event is a wine-tasting, planned and served by our section's 'sommelier', Dr. Peter Rusch. Peter's fine taste in wines and connection to California wineries serve us well at our monthly dinner events as well. This year's picnic wine-tasting features wines from the

continued on next page

SCVACS Annual Wine Tasting, Family Picnic and Awards Ceremony

Date: Saturday, July 9, 2016

4:00 p.m. Wine Tasting

5:30 p.m. Barbeque Dinner

7:00 p.m. Awards

Deadline for Reservations:

Wednesday, July 6, 2016

Location: Stanford University
Mudd Chemistry Building
<https://goo.gl/maps/gTsaM>

Registration online at:

http://scvacs.org?page_id=40#picnic

Adults: \$20.00

Student: \$10.00

Children under age 12: \$5.00

Chair's Message, continued from front page

Donati Family Winery, located near Paso Robles. Donati's grapes are grown in the Paicines AVA (American Viticultural Area) in San Benito County, an hour or so south of San Jose and east of Monterey. Peter will be pouring Donati's pinot blanc, unoaked chardonnay, rose and claret. Our picnic is also an opportunity to learn about and experience together new wines.

The highlight of our Saturday together is the opportunity to recognize and honor our long-time ACS members. We introduce those guests of honor one-by-one, hearing their tales and savoring their advice accrued over their many years in chemistry. Their careers have contributed to the integrated circuit, regenerative medicine, and safe water supplies. They have found themselves in clean rooms, wet rooms, and dark rooms; on the SF Bay's mudflats, on planes, and aboard ships; in lecture halls and hallways; in offices and boardrooms. We invite our 50- and 60-year members to the summer picnic to honor them as pioneers of their fields. The picnic gives them an opportunity to tell us about their accomplishments in their chemistry careers and for us to hear their stories of personal successes and historical perspectives.

Finally, the picnic provides us the opportunity to meet new people and see old friends, to talk about research and lives in the Bay Area, and to relish being in the company of like-minded folks while broadening our view with their range of experiences.

This year's "picnic" is on Saturday, July 9th. Registration information can be found in this July newsletter. Don't wait long to register as orders get placed with our caterer on July 6th. We look forward to seeing you, your friends and family there!

Happy 4th of July



The 2016 National Inventors Hall of Fame

By Howard Peters – patent attorney – retired

In 1973, the U.S. Patent and Trademark Office www.uspto.gov joined with other interested groups to create the National Inventors Hall of Fame (NIHF) www.invent.org. This was done to recognize the people whose invention and ingenuity had a major impact on the growth and history of the United States. The only inventor inducted in 1973 was Thomas A. Edison. The next year, the following inventors were inducted: Eli Whitney for the 18th century cotton gin, Alexander Graham Bell for the 1876 telephone and John Bardeen, Walter Brattain, and William Shockley for the transistor in the 20th century.

Living and deceased inventors have been inducted annually every year since. At least one issued U.S. patent is required for consideration. In the intervening years, the NIHF moved from the U.S. Patent Office to Inventure Place in Akron, Ohio, for several years. The NIHF has since moved back to the Washington DC area and can be viewed and searched at www.invent.org and at the new U.S. Patent and Trademark Office complex in Alexandria, VA. The deadline for nominations is each June 30 and anyone or any organization can nominate an inventor for consideration. The announcement of the annual selection of the living and deceased inventors to be inducted is made in February and can then be found on the web at www.invent.org with a photograph, biography and number of the US. Patent. (The actual U.S. patent can be searched by number and viewed at www.uspto.gov and also found on another patent site (old IBM) including the drawings at www.pat2pdf.org. Do not use any commas.) The NIHF induction ceremony in early May is a black-tie affair usually held at the National Portrait Gallery in Washington DC.

The list of the 2016 NIHF inductees follow below.

BTW -- Dr. William Sparks was one of two chemists inducted into the NIHF both for the invention of butyl rubber. He was also the President of the American Chemical Society in 1966. His wife Meredith had also obtained a Ph.D. in Chemistry at U. Illinois and later a law degree to practice patent law. Meredith Sparks was a pioneer as a female patent attorney and later became president of the National Association of Women Lawyers (1981-82). She was an early supporter of ACS's Division of Chemistry and the Law.

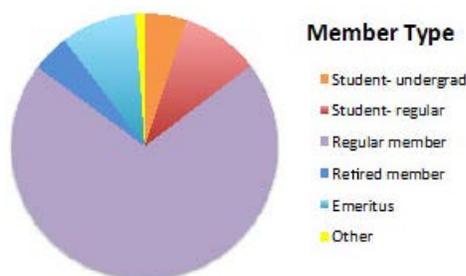
INVENTOR	TITLE	PATENT NO.
JD Albert	Electronic Ink	5,961,804
Roger Angel	Lightweight Mirrors for Astronomical Telescopes	4,606,960
Roger Bacon	High-Performance Carbon Fibers	2,957,756
Bantval Jayant Baliga	Insulated Gate Bipolar Transistor (IGBT)	4,969,028; 5,998,833
Per-Ingvar Brånemark	Modern Dental Implant	4,988,299
Barrett Comiskey	Electronic Ink	5,961,804
Joseph Jacobson	Electronic Ink	6,124,851
Sheldon Kaplan	EpiPen® Auto-Injector	4,031,893
Victor Lawrence	Signal Processing in Telecommunications	4,034,197; 4,213,187
Radia Perlman	Robust Network Routing and Bridging	5,086,428; 7,339,900
John Silliker	Microbiological Food Safety and Testing	2,876,108
William Sparks	Butyl Rubber	2,356,128
Harriet Strong	Water Storage and Flood Control	0374,378
Ivan Sutherland	Display Windowing by Clipping	3,639,736
Welton Taylor	Microbiological Food Safety and Testing	4,010,078
Robert Thomas	Butyl Rubber	2,356,128

Demographic Survey of the Santa Clara Valley ACS Membership

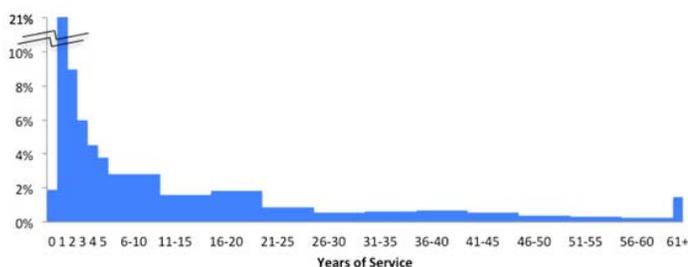
Nicole Bouley Ford

Source: American Chemical Society annual membership survey

As of June, 2016, the total number of members in the Santa Clara Valley section is 2,673. The distribution by member types is shown below:



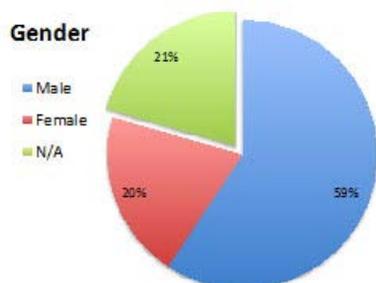
The majority of members (70%) are regular members with the remaining roughly split between student categories (14.5%) and retired/emeritus members (13.5%). The “other” category includes 29 society affiliates and 1 local section member.



A distribution by years-of-service is shown above. A significant population has only been a member for one year (21%) to a few years.

Our call to members: The remainder of the member statistics is plagued with incomplete data, indicated by N/A in the graphics below. Please fill out your demographics survey at www.acs.org/demographics. You can also reach ACS Member Services at 1-800-333-9511 (before 5pm EST) to check and/or update your selections. This will result in more accurate member statistics in the future. Below, we indicate reported results with the caveat of the large number of “N/A” or “No Response” responses.

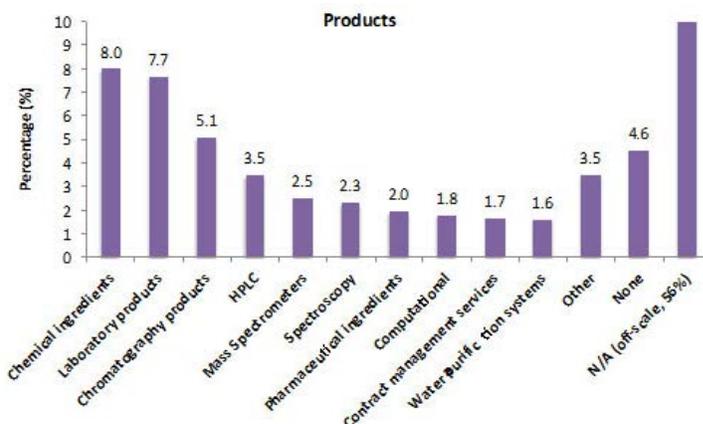
Of the few respondents to the education question (37%), the population heavily leans towards chemists with higher education. The highest degree received: Doctorate (662) > Master (162) > Bachelor (135) > Associate (5)/High School (32).



The majority of members are male. The gender composition of the ACS as a whole is similar with about a 3:1 reported ratio of males-to-females in 2010.

The most popular job titles are chemist/scientist (25.4%), research & development management (13.1%), professor/instructor/administra-

tor (9.4%), and graduate student (6.7%). “No response” and “N/A” were less significant for this category, 9.2% and 3.1% respectively.



Members’ products are indicated above. Other includes “other” responses, as well as products with less than 1% response: NMR, thermal analyzers, LIMS, and supercritical fluid chromatography.

We show a sampling of the disciplines within chemistry that the respondents indicated as their formal degree field and their field of research. The reporting rate is similar for degree discipline (1,706 respondents, 64%) and field of research (1,610 respondents, 60%), resulting in close to a 1:1 response rate.

	Field of Degree	Field of Research*	Net Change from Education to Employment
Organic chemistry	291	114	-61%
Physical chemistry	109	32	-71%
Biochemistry plus Biotechnology	105	163	+55%
Inorganic chem.	63	29	-54%
Chem. engineering	58	23	-60%
General chemistry	57	-	N/A
Analytical chem.	51	82	+61%
Medicinal/pharmaceutical	49	226	+361%
Materials science	13	70	+438%
Computer science/ Computational	6	42	+600%

*The survey has more categories for field of research than degree discipline; we chose representative categories.

We were interested in exploring the percentage of chemists who go on to carry out research in the core disciplines in which they received a degree. Degrees are listed from most to least popular disciplines. Chemists with degrees in organic, physical, and inorganic chemistry and chemical engineering were more likely to pursue research in an alternative field of research. In contrast, many chemists who carry out research in these fields did not receive a degree in the same discipline: biochemistry, biotechnology, analytical chemistry, medicinal/clinical, pharmaceutical, materials science, and computational/computers/informatics.



The Commercialization of Radiation Chemistry

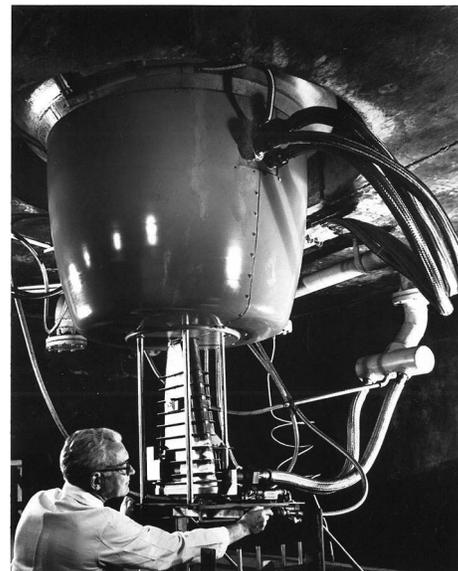
By Ean Warren with credit to ACS Chemical Landmarks

ACS established the National Historic Chemical Landmark (NHCL) program in 1992 to recognize seminal achievements in chemistry. The mission of the NHCL program is to enhance public appreciation for the contributions of the chemical sciences to modern life in the United States and to encourage a sense of pride in their practitio-



ners for chemistry's rich history. Through this program, ACS grants Landmark status to significant locations in the history of the chemical sciences such as the invention of Bakelite, the world's first synthetic plastic; the discovery and development of penicillin; and the work of historical figures such as Joseph Priestley, George Washington Carver and Rachel Carson.

The Santa Clara Valley local section has its own NHCL site in Redwood City. The site commemorates the commercialization of radiation chemistry by Raychem Corporation. Founded in 1957, Raychem Corporation was the first company to successfully apply the new science of radiation chemistry to commercial use. This accomplishment



led to the creation of tough new materials and high-performance products such as irradiated polyethylene insulated wire and heat-shrinkable tubing through the crosslinking of polymeric materials. The success of this enterprise established radiation chemistry as a practical, safe, cost-effective use of ionizing radiation and helped make the United States the world leader in the development of commercial radiation technology and equipment.

In 1950, the United States Government embarked on a search for peacetime applications for atomic energy. The most promising application was the nuclear power reactor, seen as an abundant source of clean energy. To extend the value of reactors to the commercial sector, the government funded research on uses for the radioactive by-products of reactor operations.

As part of that research, the reactor Development Division of the Atomic Energy Commission sponsored a study at the newly created Stanford Research Institute (SRI) in Menlo Park, California. The purpose of the study, supervised by 25-year-old chemical engineer Paul Cook, was to determine the potential industrial uses of waste fission products — alpha emitters, beta emitters, and gamma ray producers.

The study concluded that there were limited industrial uses for waste fission products. However, as a result of these studies and subsequent experiments conducted by Cook at SRI and elsewhere, he became convinced that radiation could be used to develop new materials for industrial applications. When a reliable, low-cost source of ionizing radiation became available, Cook — with James B. Meikle and Richard W. Muchmore — founded the first company based on radiation chemistry, the field of knowl-

continued on next page

Revamped US Chemical Rules Signed into Law

After forty years, the law that regulates new and existing chemicals in the US has been updated. President Obama signed the new law to update the Toxic Substances Control Act (TSCA) on June 22nd, 2016, two weeks after it passed the Senate by unanimous consent, and almost a month after being approved by the House of Representatives.

In 1976, some 62,000 chemicals were already on the market. The TSCA placed demands on the Environmental Protection Agency (EPA) that exceeded the agency's capacity to evaluate new and existing chemicals. Out of those original 62,000 chemicals, a small percentage has been reviewed and only five have been banned. As of 2015, only 250 of the 62,000 chemicals have been directly tested by the EPA: 140 by regulatory order and 60 after consent by the manufacturer.

"This system was so complex, it was so burdensome, that our country hasn't even been able to uphold a ban on asbestos — a known carcinogen that kills as many as 10,000 Americans every year," Obama said. The updated TSCA will streamline the review of existing chemicals using a new risk-based safety standard. The law includes mandatory requirement for EPA to evaluate existing chemicals with clear deadlines, and provides for a consistent source of funding for EPA to carry out the responsibilities under the new law.

Representatives of the chemical industry, as well as public health and environmental organizations backed the legislation and were present when it was signed into law. "This is proof that even in the current polarized political climate here in Washington, things can work — it is possible," Obama stated. "If we can get this bill done, it means that somewhere out there on the horizon we can make our politics less toxic as well."

<http://www.rsc.org/chemistryworld/2016/06/obama-signs-us-chemical-law-toxic-substances-control-act>

Chemistry Quiz

An analysis of the literature from 1984 to 2014, found that among the most frequently used synthetic reactions, none was discovered within the last twenty years, and only two in the 1980's and 1990's. What were those two reactions?

Last Month's Quiz

What class of molecules is not found in genuine Parmigiano-Reggiano cheese but IS found in knock-offs bearing that label, making it a detectable marker for Parmigiano-Reggiano cheese authenticity?

Real Parmigiano-Reggiano cheese does not contain cyclopropane fatty acids, found in the milk of cows fed fermented fodder. Caligiani recently showed that cyclopropane fatty acids were absent in all of the cheeses whose Production Specification Rules expressly forbid the use of silages (Parmigiano Reggiano, Fontina, Comté, and Gruyère). [J. Agric. Food Chem., 2016, 64 (20), pp 4158–4164]

continued from previous page



Master of Ceremonies, B. John Lyons.



Dr. Paul Anderson, Chair of the NHCL Committee presents the plaque.

edge concerned with the chemical effects of radiation on different materials. Cook and the employees of the company that became Raychem Corporation proved the commercial value of treating and altering the chemical structure of polymeric products in their final form, giving them special properties and characteristics that could not be easily created using any other method.

By successfully commercializing radiation chemistry, Cook achieved three things. First, primarily as a result of the demand for particle accelerators from Raychem and others, the United States took the clear lead in the development of commercial radiation technology and equipment. Second, he developed products that greatly improved the performance of electronics components, electrical insulation, and the world's industrial and telecommunications infrastructure. Third, he created a new industry that today provides jobs to thousands of people all over the world and generates revenues of more than \$10 billion annually.

The NHCL site at Raychem Corp (now TE Connectivity) at 501 Oakside Avenue, Redwood City, was dedicated on April 9, 1997 and still has the original historical marker. Learn more about the history of the radiation chemistry, this site, and other chemistry achievements at ACS's website (<https://www.acs.org/content/acs/en/education/whatischemistry/landmarks/radiationchemistry.html>).

A complete list of designated achievements is available on the Directory of National Historic Chemical Landmarks.

New Bipartisan Congressional Chemistry Caucus

By Heidi Vollmer-Snarr

Do you ever wish that the U.S. government better represented your scientific views and interests? A new bipartisan Congressional Chemistry Caucus endorsed by the ACS and other chemistry organizations was launched on April 27, 2016. The Chemistry Caucus will provide a direct pipeline from ACS scientists to Congress and ultimately to the Senate to answer scientific questions about pressing scientific issues relating to chemistry.

This is a critical time for us ACS members to contact the members of Congress in our districts to persuade them to join the caucus. We have developed specific talking points about the Chemistry Caucus and how it is relevant to members of Congress from specific districts. We provide you this information on a [dedicated page](#) of our Santa Clara Valley ACS website, and encourage you to reach out as scientific professionals to your lawmakers.

Watch the [ACS video](#) to prepare to interact with your [representatives](#) in Congress. This is an opportunity to make a difference!

Replacing the World's Most Destructive Industry

"Replacing the World's Most Destructive Industry" - the goal of Redwood City start-up Impossible Foods - was a stellar learning opportunity for members and friends of the SCVACS on a sunny spring evening at May's monthly section dinner meeting. A standing-room-only group of chemists and friends listened to founder Pat Brown frame the many global problems created by raising animals for human food. Environmental stewardship took center stage in the presentation, viewable on-line as an "ACS Presentation on Demand"

<https://presentations.acs.org/common/media-player.aspx/Fall2015/MPPG/MPPG1a/N102454>

In addressing alternatives to the cattle industry, global solutions for world hunger, loss of biodiversity, and water resources were raised. Closer to home and on our dinner plates, Impossible Foods goes about deconstructing the meat-eating experience, and reconstructing it from plant-based proteins. The reconstruction is complex, including aromas and colors on pyrolysis, thermoelastic properties on chewing, and, of course, flavor. Impossible Food products can be found on restaurant menus of a few selected chefs in the SF Bay area while we wait for their appearance on supermarket shelves.

Check out here what others have to say about Impossible Foods:

<http://impossiblefoods.com/press>

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 seminar 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 seminar meetings are at a local spot, somewhat convenient to the 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 for May

Prof. Annelise E. Barron	Alisa Gaule	Dr. Nick A. Paras
Dr. Paul Beroza	Holly Hajare	Naomi Rajapaksa
Dr. Thomas Henry Cauley III	Dr. Charlotte Larson	Devleena Samanta
Michael Chen	John Christopher Lin	Myeong-Lok Seol
Dr. Bruce Clapham	Steven McKerrall	Danielle Westerman
Dr. Donna Ann Dulo	Kritika Mohan	Erin Wood
Samantha J. Friedman	Niharika Neerudu Sreeramulu	Weichen Xing
Nick Garcia		



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



*Come to the SCVACS Annual
Wine Tasting, Family Picnic,
and Awards Ceremony
at Stanford on Saturday, July 9th*

To receive an email when our newsletter
is published on our web site, sign up at:
<http://www.scvacs.org/newsletter/>

SANTA CLARA VALLEY SECTION

2016 Section Officers

Chair	Jane Frommer	408-927-2224	frommer@scvacs.org
Chair Elect	Todd Eberspacher	650-723-2505	eberspacher@stanford.edu
Past Chair	Abby Kennedy	209-640-2005	akennedycali2007@yahoo.com
Secretary	Richard Bone	650-714-7897	rgab@scvacs.org
Treasurer	Ihab Darwish	650-594-1654	darwishis@yahoo.com

Councilors

2014-2016	George Lechner	408-226-7262	glechner@aol.com
2014-2016	Herb Silber	408-924-4954	hbsilber@science.sjsu.edu
2016-2016	Peter Rusch	650-961-8120	pfrusch@aol.com
2015-2017	Ean Warren	650-329-4554	ewarren@scvacs.org
2016-2018	Bonnie Charpentier	650-380-5353	charpentierbon@yahoo.com
2016-2018	Linda Brunauer	408-554-6947	lbrunauer@scu.edu
2016-2018	Sally Peters	650-854-4614	sallybrownpeters@gmail.com

Alternate Councilors

2014-2016	Mark Kent	408-736-0989	markkent@yahoo.com
2015-2016	Howard Peters	650-854-4614	peters4pa@sbcglobal.net
2015-2017	David Parker	408-615-4961	drdrparker@comcast.net
2016-2016	Matt Greaney	510-410-0195	greaney19@gmail.com
2016-2018	Natalie McClure	650-906-7831	nmclure@drugregulatoryaffairs.com
2016-2018	Heidi Vollmer-Snarr	650-723-9518	hrvsnarr@stanford.edu
2016-2018	Stephanie Bachmann	408-429-9681	s_gehling@hotmail.com

Newsletter

Editor	Kevin Greenman	408-634-2309	editor@scvacs.org
Assoc. Editor	Partha P. Bera		partha.pb@gmail.com

ChemPloyment Abstracts

Director:	Liang Cao	liang.cao@aol.com
-----------	-----------	-------------------

FUTURE EVENTS

- Jul 9** SCVACS Annual Wine Tasting,
Family Picnic and Awards Ceremony
Stanford University
Mudd Chemistry Department
<https://goo.gl/maps/gTsaM>
- Jul 14** Got Planets?
Dr. Olenka Hubickyj
SRI Café Scientifique
Menlo Park, CA
<http://www.cafescipa.org>
- Jul 16** Hayward Fault Walking Tour
Fremont, CA
<http://msnucleus.org/haywardfault/hayward.html>
- Aug 21-25** 252nd ACS National Meeting
Philadelphia, PA
<http://www.acs.org/content/acs/en/meetings/td.html>
- Aug 31** Behind the Bark: Saving Seals and Sea Lions
in California
Pacifica Library
<https://acs-sfbay.org/2015/11/03/behind-the-bark-saving-seals-and-sea-lions-in-california>
- Sep 18** Fall Free Day at the Exploratorium
San Francisco, CA
www.exploratorium.edu/visit/calendar/fall-free-day-2016