

# Silicon Valley Chemist

Santa Clara Valley Section

American Chemical Society

Volume 38 No. 12

## DECEMBER 2016 NEWSLETTER TOPICS

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## Connect with Chemists

Meet fellow local chemists  
for an early morning coffee.

Look for Ean at a table with molecular models.

**Thursday, December 29, 2016, at 7 a.m.**  
Coupa Café, 538 Ramona Street, Palo Alto  
(a half a block off from University Avenue)

## Chair's Message

Jane Frommer



The December Chair's Message is typically retrospective, summarizing the year's events in the last days of chair duty. I will follow the tradition.

The past year has been more challenging than expected, due in large part to the departure of Karl Marhenke from our leadership group. For over two decades Karl held the position of section

### Abstract

Imagine a world where all segments of society demanded environmentally benign products! Imagine if all consumers, all retailers and all manufacturers insisted on buying and selling only non-toxic materials! The unfortunate reality is that, even if this situation were to occur, our knowledge of materials science and chemistry would allow us to provide only a small fraction of the products and materials that our economy is based upon. The way we learn and teach chemistry and materials science is for the most part void of any information regarding mechanisms of toxicity and environmental harm. Green Chemistry is a philosophy that seeks to reduce or eliminate the use of hazardous materials at the design stage of a material's process. It has been demonstrated that materials and products CAN be designed with negligible impact on human health and the environment while still being economically competitive and successful in

secretary, even expanding it to perform other services for the section. He was an incredible asset to the section that became dependent on him and his accrued knowledge for its smooth running. As with many things of great value, their absence brings about the realization of how extensive a role they played. The Santa Clara Valley ACS owes a huge debt of gratitude to Karl for his years of selfless service.

The transition has reinforced the importance of continuously refreshing our leadership team with new talent and perspectives. The 2016 ExComm has several newcomers who, in turn, successfully recruited more newcomers, so the future is looking bright. In addition to

*continued on next page*

### Mosher Award Dinner Seminar

## Innovation and Sustainability: Designing the Future

Dr. John Warner



the marketplace. This presentation will describe the history and background of Green Chemistry and discuss the opportunities for the next generation of materials designers to create a safer and more sustainable future.

### Biography

Dr. John Warner is the recipient of the 2014 Perkin Medal, widely acknowledged as the highest honor in American Chemistry.

*continued on next page*

## January Dinner Seminar

**Date:** Thursday, January 26, 2017

6:00 p.m. Social Hour

7:00 p.m. Dinner

8:00 p.m. Presentation

**Speaker:** Dr. John Warner  
President and CTO  
Warner Babcock Institute for  
Green Chemistry  
*Innovation and Sustainability:  
Designing the Future*

**Location:** Biltmore Hotel & Suites  
2151 Laurelwood Blvd.  
Santa Clara, CA 95054

**Cost:** \$28.00 regular members  
\$14 students  
Grilled Salmon or Eggplant  
Parmesan

**Registration:** <http://scvacs.org/>  
Sally Peters 650-854-4614

Reservations should be made by Jan. 23rd stating your name, address, company/school affiliation, number of people in party. Watch the web site for more information. If you are unable to honor your reservation please cancel by Wednesday, January 25th.

*Mosher Award, continued from front page*

can Industrial Chemistry, and was named a 2016 AAAS-Lemelson Invention Ambassador. He received his BS in Chemistry from UMASS Boston, and his PhD in Chemistry from Princeton University. After working at the Polaroid Corporation for nearly a decade, he then served as tenured full professor at UMASS Boston and Lowell (Chemistry and Plastics Engineering). In 2007, he founded the Warner Babcock Institute for Green Chemistry, LLC, (A research organization developing green chemistry technologies) where he serves

as President and Chief Technology Officer, and Beyond Benign (a non-profit dedicated to sustainability and green chemistry education). He is one of the founders of the field of Green Chemistry, co-authoring the defining text *Green Chemistry: Theory and Practice* with Paul Anastas. He has published nearly 300 patents, papers and books. His recent work in the fields of pharmaceuticals, personal care products, solar energy and construction and paving materials are examples of how green chemistry principles can be immediately incorporated into commercially relevant applica-

tions. Warner received The 2004 Presidential Award for Excellence in Science Mentoring (considered one of the highest awards for US science education), the American Institute of Chemistry's Northeast Division's Distinguished Chemist of the Year for 2002 and the Council of Science Society President's 2008 Leadership award. Warner was named by ICIS as one of the most influential people impacting the global chemical industries. In 2011, he was elected a Fellow of the American Chemical Society and named one of "25 Visionaries Changing the World" by *Utne Reader*.

*Chair's Message, continued from front page*

bringing fresh energy and ideas, the newcomers reflect the broader cross-section of our local scientific community.

Of great satisfaction this past year was successfully establishing a Monterey Bay ACS subsection. Spring and autumn events each drew dozens of students, faculty, practitioners and admirers of chemistry for networking, dinner, and stimulating lectures. Where did they come from? Cabrillo College, Monterey Peninsula College, Hartnell College, Cal State University Monterey Bay, UC Santa Cruz, Monterey Bay Aquarium Research Institute (MBARI), Moss Landing Marine Labs, and even the San Francisco Bay area. *The kick-off event in April* at Cabrillo College - The Chemistry of Beer Aroma and Battery Energy Storage - sold out at over 60 attendees. It was sponsored in part by ACS National and by NanoAndMore, a Watsonville-based nanotechnology supplies company. *October's dinner lecture* at Moss Landing Marine Labs - The Distribution and Speciation of Mercury in the California Current from Sea to Land via Fog - gathered a similar number of attendees, half of whom were students attending an ACS event for the first time. Read Rudy Wojtecki's articles on these two events in the *May* and *December* 2016 newsletters for a sense of the enthusiasm that infuses this new endeavor. The Monterey Bay ACS subsection is fortunate to have Dr. Slava Bekker of Hartnell College now at the helm. These Monterey Bay area ACS events, though geared to serve those who live or work in the southern half of our SCVACS section from Santa Cruz to Monterey and Salinas, are open to all.

Another newly launched effort in 2016 is the Younger Chemists Committee (YCC), dormant for years in our section. Newcomer Matt Greaney organized the *kick-off event* at Santa Clara's Golden State Brewery in con-

junction with the SCVACS Senior Chemists Committee, making for lively intergenerational exchange between the nearly 50 attendees. YCC members Alex Klevay and Derek Popple documented the brewery tour and tasting in an article in *this December newsletter*. Matt also coupled in our neighboring ACS California section YCC following his year of helping to organize their events in the East Bay. Expect widespread YCC activity between our two sections - plans were hatching during the brewery tour for a YCC gathering in Livermore.

A wide range of topics were covered in our section's monthly meetings, starting in the spring with an 'aqueous phase': a Saturday morning *chemists' tour* of the Silicon Valley Advanced Water Purification Center and an evening talk on *The Future of Water* with world-renowned water expert and founder of the Pacific Institute, Peter Gleick.

A 'culinary phase' followed with dinner lectures on *The World's Most Destructive Industry and a Solution* by Impossible Foods founder and CEO, Pat Brown, and *Redesigning the Interface Between Fresh Produce and the Environment for Sustainable Agriculture* by Apeel Science founder and CEO, James Rogers. Both talks came from California start-ups with environmental stewardship at the core of their missions. Pat Brown framed the many global problems created by raising animals for human food. His *Redwood City company's* edible solutions can now be sampled in Bay Area restaurants

These four examples of ACS section talks addressed several items on George Whitesides' list of 24 societal concerns where chemistry solutions are warranted: Reengineering Chemistry - What's Next. Take a look at the list in the *February Chair's Message*.

Our year was rounded out with section traditions. National Chemistry Week, the Bay Area Science Festival Discovery Day and

Tech Trek all provided hands-on chemistry for youth, thanks to diligent organization by section members. The high school Chemistry Olympiad, Synopsys Science Fair chemistry prizes, and Project SEED elevated local students. The Bubble Grant and the Community College Teacher Scholar Award celebrated selected teachers of chemistry who go beyond expectations. We toasted 50-year and 60-year ACS members at the annual July BBQ on Stanford's campus and we conferred a host of awards for service to the chemistry community. Our scvacs.org website will soon host an outreach page where you'll find these activities aggregated, easy to access, and inviting to your volunteering tendencies.

I depart the position of Chair with the satisfaction of seeing in our section leadership a blend of experienced veterans and a sizable number of younger members, all willing to step up and serve our local section. With momentum from a concerted effort this past year to rejuvenate, they will reshape the ACS into a viable organization for generations to come.

## Chemistry Quiz

Which spice, often found in holiday recipes, contains the psychoactive compound myristicin?

### Last Month's Quiz

One of the essential minerals in the human body is sodium chloride. How much sodium chloride is in the average adult human body?

**Sodium chloride makes up around 0.4 percent of the adult human body's weight. A 70 kg person contains about 280 grams of sodium chloride.**

# Kenneth Coale's "Seeing through the Fog: Discovering the Cycling of Mercury from Sea to Land"

By Dr. Rudy Wojtecki    Photos by Derek Poppo

It is a Friday night; I've traveled directly from work in Silicon Valley avoiding as much traffic as I could on route 101 by taking the alternative windy country roads. As I step out of the car a moist salty air hits my nose and brings a sense of calm. The week is over, the sun is setting and I am yards away from the Pacific Ocean. Coastal scrub frames the Moss Landing Marine Laboratory (MLML), the site for the second meeting of the Monterey subsection of the American Chemical Society. Entering the building I am first greeted by the influential Jane Frommer, chair of SCVACS and the organizational force that started this Monterey subsection. She checks me in and knowingly points me to the wine - it was a long week. The most interesting part of this ACS section, hands down, is the unique people that make the flavor bold and complex. To give you a sense, the beverages included an array of outstanding beers as well as a selection of the guest speaker's very own wines. The delightful buttery taste of his chardonnay was fitting for the night, and paired well with the unforgettable scene of bright green grasses near the Old Salinas River, the faint echo of seals and a Pacific Ocean that was producing gentle waves.

As I mingle in the crowd, I pick out the guest speaker, though we haven't previously met. The aloha shirt paired with a gray sports coat made sense for the recovering director of the MLML and UC-Santa Cruz alumnus (both BS and PhD) - Kenneth Coale. While this image conveyed a relaxed persona, the science presented was rigorous and extremely revealing. The way the lecture was presented could not have been more engaging. After this event I've tried to describe it to friends, explaining the conversion of dimethyl mercury

to the more volatile monomethyl mercury. Generally, after "dimethyl mercury" I see them checking Facebook on their phones. Kenneth Coale engaged his entire audience. His lecture "Seeing through the Fog: Discovering the Cycling of Mercury from Sea to Land" was told like a story. We first traveled to the gold rush in California that provided perspective and context of how mercury was historically used and the lasting effects of its environmental impact. As he transitioned from this historic description to more recent findings that involve the presence of higher mercury concentrations in seawater found offshore in cyclonic eddies, Coale perceptively interpreted a blank gaze of the audience and moved off stage. He enlisted volunteers to explain the concept of a cyclonic eddy in a method more similar to interpretive dance. The demonstration was effective, everyone in the audience got it, and we were pulled back into his story as he reclaimed the stage. Proceeding on, we learned of a thin region at the surface of the ocean that locally has a much lower pH and can catalyze the formation of monomethylmercury from dimethylmercury that can then be transported by fog to onshore. This fog can contain up to 100X more mercury than the background atmospheric concentration. The lecture was a fascinating window into research

that crossed boundaries between oceanography and geography and atmospheric science not typically associated with our profession as chemists. This event rightly highlights the unique features of the new Monterey subsection of the American Chemical Society with its enthusiastic Monterey Bay area audience and topics of local interest to this audience. I am such a fan of this subsection that I have joined its new organizational group - headed by Slava Bekker of Hartnell College - to assure continuity of its activities into 2017.



# Golden State Brewery Tour and Supper

## A joint event of the Younger Chemists Committee (YCC) and Senior Chemists

By Alex Klevay    Photos by Derek Popple

In an event indicative of the joie de vivre present among Silicon Valley's scientists, on November 15 the SCVACS Younger Chemists Committee and Senior Chemists Committee provided the occasion for members and friends to descend upon the Golden State Brewery for an evening of revelry and friendship. The establishment that opened its doors in February 2016 as the first brewery in Santa Clara since prohibition, served as an ideal venue for chemists to gather together and play pool, throw darts, and, most of all, enjoy conversation. The event was supported in part by an ACS National Senior Chemists Committee Mini-Grant, successfully fostering intergenerational exchange.

Brewery founder Seth Hendrickson, who merged his restaurant management experience with his penchant for home-brewing, gave a run-down of his brewing processes. Malted barley is milled and mashed in water, activat-

ing natural enzymes that convert starches into sugars. Under a boil, hops impart their bitter alpha acids before things cool down and yeast is added to generate alcohol from the sugars. Seth's favorite beer to make, the Cold Brew Coffee Stout, is enriched with two gallons of coffee per keg along with liberal amounts of coconut sugar.

Nourished by Argentinian cuisine from Sarah's Latin Taste food truck and fueled by flights of beer, the inquisitive audience subjected the brewer to a gamut of technical questions. Mr. Hendrickson concluded his talk with a refreshing twist on a popular refrain, encouraging all the chemists to "try this at home". Or just leave it to the professionals and purchase bottles of Golden State Brewery's flagship Heritage Honey Ale from Zanotto's Family Markets or the local BevMo.

This event marked the revival of the Santa Clara Valley ACS Younger Chemists Commit-

tee, led by section officer Matt Greaney. It included chemists from the adjacent California ACS section YCC, led by Stephanie Malone. Together *Stephanie* and *Matt* are brewing robust plans for future combined section YCC events – stay tuned and reach out to them to participate.



Brewery tour led by brewmaster Seth Hendrickson

## Announcement

### Chocolate Food of the Gods

On January 6, 2017, at 6:45 pm Mr. and Mrs. Chocolate, Howard and Sally Peters, will present their fun talk *Chocolate Food of the Gods* at the Woodside Town Hall (2955 Woodside Road, Woodside, California). Admission is free. There will be samples of chocolate and a free drawing for a 10 pound bar of dark bittersweet chocolate - for those who stay to the "bitter" end. More information is available at <http://www.woodsidetown.org/artsandculture>.

Howard and Sally Peters, our local ACS 2016 Helen Free Awardees for Public Outreach for Chemistry, presented their talk on chocolate to the ACS Orange County Local Section in Santa Ana on October 20, 2016. It was the largest attendance at an ACS OC monthly meeting in years.



Steve Boyer and Nicole Ford



Esin Camci and Jane Frommer



Tara Baney, Molly Wamke and Stephanie Malone



Howard Peters and Tom Pattison



Matt Greaney, brewmaster Seth Hendrickson and Howard Peters



Livermore scientists Colin Loeb, Dan Malone and Nick Harvey



## 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 October

Aditya Agarwal	Kesong Hu	Mary Anne Manumpil	Chelsea Liliana Price	Wiriya Thongsomboon
Andrea Ambrosi	Qingyang Hu	Nathan Mathew	Ashmitha Rajendran	Lydia Dove Tomeo
Donatela Bellone	Kalyani Jambunathan	Kristen M. McGraw	Jose Jesus Ramirez	Helen Tran
Olive Escalicas Burata	Mizuki Johnson	Alifia Merchant	John Reidy IV	Xiaojuan Wang
Dr. Jayaraman Chandrasekhar	Nasrin kazem	Nur Khairunnisa Athirah	Matthew Rienzo	Jared Bryce Weaver
Valerie Chen	Camila Richards Kofman	Mohd Yunus	Joseph Romaniuk	Leslie Welch
Ying Cheng	Dr. Joon-Ho Koh	Bianca Murillo	Graham P. Roseman	Dr. Sarah Williams
Christopher Conaway	Rao Kolluri	Nicole Navarro	Dr. Renzo Alexander Samame	Nathan Robert Wolf
Steven Conradson	Michael Kratochvil	Dorothy Nguyen	Dr. Alexander Schuth	Ashley Tess Wong
Lizette Cuevas	Jolie D. Lechner	James T. Nguyen	Dr. Octavi E. Semonin	Dr. Matthew Wright
Dr. Melody Esfandiari	Yujeong Lee	Thu Nguyen	Travis M. Shaffer	Dr. Dianne Xiao
Tobias Friedberger	Qingyun Li	Forrest Matthew Nichols	Anton Shakhmin	Jie Xu
Prof. Sanjiv Sam Gambhir	Dr. Shuang Li	Dr. Adam Nielander	Chester K. Simocko	Xiaogen Yang
Dr. Jeannette Marie Garcia	Thomas Letao Li	Erin Nishimura	Parker James Smith	Dr. Jiaxin Yu
Matthew Allen Gebbie	Binhong Lin	Jihye Park	Zach Sobell	Rui Zhang
Rosalia Pet Gemora	Dr. Feng Liu	Dr. Bruce Drury Phebus	Sara Sorden	Dr. Yu Zhao
Melissa Anne Gray	Tzu-Hsuan Liu	Greg Pitch	Dr. Nathaniel Stanley	Dr. Zhongdong Zhao
Dr. Dmitri Y. Gremyachinskiy	Natalia D. Loewen	Dr. Elizabeth Pollom	Dr. Raju Subramanian	Dr. Xiaoti Zhou
Dr. William J. Harris	Rachael Marie Lucero	McKay Porter	Jing Tao	Chenxi Zu

## CHEMPLOYMENT ABSTRACTS DECEMBER 2016

### CHEMPLOYMENT ABSTRACT 3995

*Position Title:* Organic Chemistry II Instructor

*Job Description:* Instructor for second semester of Organic Chemistry lecture and laboratory.

Lecture: MWF 1:00-1:50 pm

Labs: M 2-5pm, M 6-9pm, and W 8-10:50am (with some flexibility in scheduling the labs)

#### QUALIFICATIONS DESIRED:

*Education:* Ph.D. preferred, Master's required. Chemistry or related field.

*Experience:* Master's Degree with college-level teaching experience required. Ph.D. with college teaching experience welcomed.

#### LOCATION, SALARY, EMPLOYER:

*Job Location:* Belmont, CA

*Salary:* DOE

*Description:* NDNU is committed to providing an educational environment that supports a diverse student population, in particular, first-generation college students, Hispanic students, as well as students from low-income or under-prepared backgrounds.

*Application Instructions:* Please send cover letter and CV to: Melissa McAlexander, Ph.D., [mmcalexander@ndnu.edu](mailto:mmcalexander@ndnu.edu). In your cover letter, please include information about your experiences in working in a diverse environment, and what qualities you would bring to supporting this commitment to inclusive excellence at NDNU.

### CHEMPLOYMENT ABSTRACT 3996

*Position Title:* Chemistry Consultant

*Job Description:* This consultation position involves setting up special chemistry apparatus and equipment, running organic chemistry experiments using the equipment, using outsourced analytical instruments to characterize the products, and analyzing the data.

#### QUALIFICATIONS DESIRED:

*Education:* PhD in organic chemistry or Masters (with extensive experience in wet labs)

*Experience:* Work with thermal/pressure systems at lab/pilot scale

#### LOCATION, SALARY, EMPLOYER:

*Job Location:* BioCube, San Jose, CA

*Salary:* Competitive hourly/monthly consultation offer (varies depending on experience) and the potential to turn into full-time employment in early 2017

*Description:* Startup company BioCollection Inc. See website - [www.BioCollection.com](http://www.BioCollection.com)

*Application Instructions:* Send cover letter and resume to [jeanny@biocollection.com](mailto:jeanny@biocollection.com)



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



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is published on our web site, sign up at:

[http://scvacs.org/?page\\_id=99](http://scvacs.org/?page_id=99)

## 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	drrparker@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

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### ChemPloyment Abstracts

Director:	Liang Cao	liang.cao@aol.com
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## FUTURE EVENTS

- Jan 6** Chocolate Food of the Gods  
Howard and Sally Peters Presentation  
Woodside, CA  
[www.woodsidesidtown.org/artsandculture](http://www.woodsidesidtown.org/artsandculture)
- Jan 15-20** 23rd Winter ACS Fluorine Conference  
Clearwater Beach, FL  
[www.winterfluorineconference2017.com/](http://www.winterfluorineconference2017.com/)
- Jan 22** *21st Century Conservation - Insights from Monarch and Checkerspot Butterflies*  
Dr. Stuart Weiss  
Pacific Grove Museum of Natural History  
Pacific Grove, CA
- Jan 26** SCVACS Mosher Award Dinner  
Dr. John Warner, President and CTO of  
Warner Babcock Institute for Green  
Chemistry  
Innovation and Sustainability: Designing  
the Future  
Biltmore Hotel & Suites  
Santa Clara, CA
- Jan 28** Stanford Engineering Opportunity Job Fair  
Huang Engineering Center  
Stanford, CA  
<https://events.stanford.edu/events/642/64209/>
- Click on links for more information or  
see this newsletter at [http://scvacs.org/?page\\_id=99](http://scvacs.org/?page_id=99)