

# Silicon Valley Chemist

Santa Clara Valley Section

American Chemical Society

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## APRIL 2015 NEWSLETTER TOPICS

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## Fuel Cells: Concepts, Implementations and Practicalities

Dave Sopchak

Dave Sopchak is a consultant on fuel cells and electrochemistry and an adjunct professor at San Jose State University. He received his undergraduate degree in chemistry at Rutgers University and from there went on to earn a Ph.D. in electrochemistry under Barry Miller at Case Western Reserve University in Cleveland. His thesis was on the electrochemistry of boron-doped diamond. From there he worked at a fuel cell

startup in Florida for two years before joining the Center for Micro and Nanotechnology at Lawrence Livermore National Laboratory as a postdoc in 2002. While at LLNL he helped start UltraCell, a startup that made the first portable manufacturable reformed methanol fuel cell systems. He left LLNL for UltraCell in 2005. After spending 5 years at UltraCell, he left as Chief Scientist. He has spent the last few years working on and consulting for fuel cell, flow battery and electrochemical sensor applications. He is presently in the process of launching a new start up venture.

### Connect with Chemists

Meet fellow local Chemists for an early morning coffee.

Look for Ean at a table with molecular models.  
**Thursday, April 16 at 7:00 am**  
Le Boulange, 151 University Avenue, Palo Alto

## April Dinner Meeting (Change in Date and Location)

Date: **Friday, April 24, 2015**  
Time: 6:00 Social Hour  
7:00 Dinner  
8:00 Presentation  
Speaker: Dr. David Sopchak  
San Jose State University  
Fuel Cells  
Location: Mission College, Hospitality Management Building  
[http://www.missioncollege.org/gen\\_info/campus\\_maps/index.html](http://www.missioncollege.org/gen_info/campus_maps/index.html)  
Cost: \$20.00  
Wonderful Buffet  
Reservations: [www.scvacs.org](http://www.scvacs.org)  
Dr. Ashley Piekarski  
Ashley@scvacs.org  
Reservations should be made by April 20th 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 Tuesday, April 21st.

## Chair's Message

Ashley Piekarski



I didn't get a chance to talk about the Teacher Scholar Award Dinner that was held at Mission College on February 19th so I wanted to take the opportunity to talk about the outcome of the event. This award is near and dear to my heart since I am a community college professor myself. Harry Ungar started the award, and Santa Clara Valley was the first amongst ACS local sections to give out this award!

This year the award was given to Robert Tricca of Cañada College. Hearing his story about his transition from industry to education was truly inspirational, and it was really amazing to see his students come to the dinner meeting to support him. Like all good educators, community college professors work long hours to create lectures and activities that will help students master the material.

Especially teaching college-level general chemistry and organic chemistry, which are prerequisites to numerous engineering and medical fields, instructors are challenged with making chemistry fun and easy to learn. It not only takes an individual who has experience studying chemistry at the graduate level (Masters or PhD), but it requires someone to know how to explain the difficult concepts in multiple ways to entry-level college students. To receive this award means an instructor goes above and beyond what is expected of them in the classroom. It was fascinating to learn that Professor Tricca has established an undergraduate research lab at Cañada College, an experience that not many community college students are able to do prior to transferring to a university due to lack of resources and fund-

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*Chair's Message, continued from front page*  
ing at community colleges.

Did you attend community college in the Bay area and take a chemistry class? If so, did you have a faculty member who stands out in your mind as someone that went above and beyond to help you understand the material when you were starting out your career? If there is someone you would like to nominate for next year's award, please contact me at [ashley@scvacs.org](mailto:ashley@scvacs.org). I will let you know the details of the nomination! Speaking from experience, it is truly rewarding to hear from former students their gratitude regarding their positive experience in my classroom! So if there is someone who stands out in your mind that helped you along your education as an exceptional community college professor, do not hesitate to nominate that distinguished faculty member for next year's award!

## Excerpts from the Address of Priestley Medalist Jacqueline K. Barton at the 249th ACS National Meeting

Frequently when I travel to different chemistry departments, I end up talking with young people, and they ask about my career path. In fact, just before hearing about this award, I was at Penn State, and at the poster session, a young woman asked very straightforwardly, "So how did you get to be you?" Let's be clear, it wasn't by design. It was the result of a succession of accidents and opportunities. So I thought that would be the basis of my talk, an illustration of one career in chemistry. There are no recipes for getting here—just taking advantage of accidents and opportunities. But chemistry has an extraordinary number of options for careers, and I think it's important for young people to understand that.

It was at Barnard College, a women's col-

lege within Columbia University, where I fell in love with chemistry, and especially being in the lab, carrying out chemical transformations and trying to figure out what I had made. I was taught physical chemistry by Bernice Segal, a strong woman with a booming voice who wrote as much back in your lab book as you had written in the first place. She had very high expectations for her students, and while we were all scared to death of her, we did our best to rise to meet those expectations. Watching Professor Segal in action, I thought maybe I would be a college teacher. I certainly didn't think there was anything strange about women doing chemistry; after all at Barnard, a women's college, doing chemistry was just fine.



## Science Project Mentoring, 7 Years Later

SCVACS chair-elect Jane Frommer has been a science fair judge for many years at the Synopsys Championship and Intel ISEF. In 2008 she mentored Justin To of San Jose's Oak Grove High School, a Synopsys science fair award winner, to advance to Intel ISEF. That mentorship continues to today.

She wrote this article for the Synopsys Science Fair community and invited Justin to co-author it.

### ***Mentor Jane Frommer***

He was assigned to me. A winner in the local Synopsys Santa Clara Valley Science Fair, he was due a mentor to prepare him to continue to the Intel ISEF. I didn't know him, nor had I seen his winning project. My duties as a judge every March had not included his display.

His project first struck me as familiar territory. Aerogels - lightweight porous dielectric silicates - were a class of materials under study at my IBM Almaden Research Center workplace. Then it struck me that this was a high school sophomore, thinking with the sophistication of a professional colleague.

Thus began my mentoring relationship in 2008 with Justin To. It continues today.

Subsequent Synopsys science fairs in 2009 and 2010 yielded more awards for Justin and more Intel ISEF mentoring opportunities for me. When the science fair organizers again asked me to mentor Justin, I countered that he should not feel constrained to stick with the same mentor. "He is requesting you", they

replied.

We continued our mentoring relationship, through science fair projects to college applications; through college acceptances and into Harvard University; from research in his chemistry department to a biotech internship off-campus; from study abroad in Europe to job interviews in the consulting sector. Threads ran through our conversations over the years, such as my fascination with his range of enrichment activity from on-campus student leadership in the National Collegiate Research Conference to off-campus improv comedy classes. I remained consistent in my encouragement to branch out yet not lose sight of scientific principles, to stay open to opportunities from unlikely places.

During Justin's four undergraduate years as a chemistry major I willingly met with him in his territory, toured his spots on campus and enjoyed new restaurants in Cambridge. Most gratifying was watching a science educa-

tion evolve through Justin's experiences. A combination of chemistry and business has held his interest since high school, despite my bias that the profit motive should not detract from the solidity of scientific content. He respectfully acknowledges my concern while continuing to grow and branch out.

It's 2015 and Justin is in his first year at McKinsey & Company, consulting in the pharma sector. Our relationship persists and evolves. Now we learn from each other. I learn about the demands of the marketplace and the quick pace of his work environment. He knows that in me he has a critical yet encouraging mentor who gets immense pleasure from his success.

### ***Mentee Justin To***

Originally, my mentor for the Intel ISEF 2008 was meant to simply provide me with feedback for my abstract and poster presentation on the facile synthesis of aerogel. Of course, like anyone else who has interacted with her, I soon discovered that Dr. Frommer was a nonpareil mentor who had an infectious enthusiasm for the sciences. I did not place at ISEF that year, but my experience with Dr. Frommer had me knocking on ISEF's door again in 2009 and 2010, where I won fourth and first place in my division, respectively.

Dr. Frommer was my mentor for ISEF 2009 and 2010 as well, but I also considered her to be my mentor in my non-science fair aspects of life (although during those years,



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preparing for the science fair may as well have been my life). I turned to her while applying to college, seeking her advice on where and how I should apply. When I was dismayed from being deferred from MIT in their Early Action phase, I turned to her again for some perspective. "The world's a big place, the number of good colleges is large, and you will find yourself with plenty of choice for an exciting place to live the next four years of your life," she wrote—and was she right. When I was accepted into Harvard, she was the first person outside my family I told.

While on the East Coast for school, I still kept in contact with Dr. Frommer. We would meet for meals when she came back to visit her roots in Cambridge (at restaurants like Catalyst or Hungry Mother), and when I came back to San Jose for the holidays (at The Table, Kenzo, Nam Vang, or even IBM Almaden). In my freshman year of college, she advised me on my selection of a chemistry laboratory to conduct undergraduate research. As my interests started to expand beyond research, Dr. Frommer introduced me to some of her colleagues in the biotech industry and consulting, igniting my dormant interest of the intersection between science and business.

My life has been a series of fortunate

events. I was a first-generation college student, and the first student from my high school to be accepted into Harvard. After graduating college, I was fortunate enough to obtain a competitive position in consulting (in pharma-

ceuticals, among other industries) at McKinsey & Company. Dr. Frommer's mentorship has been invaluable along the way. For this, I count being assigned to Dr. Frommer as a mentee in 2008 as one of my greatest fortunes.

## How to Create a Safety Culture While Growing Your Business, Tuesday, April 14th



The American Chemical Society Industry Member Program is launching a new initiative tailored to the needs of small business and industry professionals. The program will be broadcasted live nationwide while attended locally in small groups.

"How to Create a Safety Culture While Growing Your Business" is the topic of the first event. It will be hosted by Neal Langerman of Advanced Chemical Safety, a company dedicated to the prevention of workplace injuries, illnesses and environmental damage. Joining him will be speakers Brian Morin of Dreamweaver International and Ken Fivizzani from the ACS Division of Chemical Health & Safety. The speakers will discuss safety protocols and requirements and the small business challenge.

This event combines a live broadcast and real-time Q&A with an onsite program hosted locally and simultaneously nationwide. In the format of an "ACS Program-in-a-Box," ACS national provides the expert speakers and a physical box with materials for the afternoon event. Evans Analytical Group (EAG) is providing our group a conference room in their centrally located facility at 810 Kifer Road, Sunnyvale.

The local Santa Clara Valley ACS chapter provides refreshments, encouraging networking. The event is offered at no cost to attendees as a public service of the ACS to support the small business culture.

A second event is planned for November 2015 on the topic "Keeping Current with Environmental Regulations". Additional gatherings on topics of local or statewide interest might ensue if interest is generated among the local small chemistry-related businesses.

This event is open to the public and requires registration. Register to attend at [www.scvacs.org/smallbusiness/](http://www.scvacs.org/smallbusiness/) Learn more about the ACS program to support small businesses at [www.acs.org/content/acs/en/events/program-in-a-box/pib-on-demand/safety-culture.html](http://www.acs.org/content/acs/en/events/program-in-a-box/pib-on-demand/safety-culture.html)

## 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 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 for March

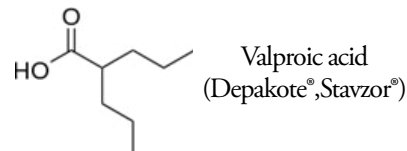
Mark Becker	Justin A. Kerszulis	Dr. Richard P. Rucker
Johan Henk Both	Dr. Sandy Koppenol	Dr. Jelena Samonina-Kosicka
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Katherine A. P. Corn	Amani R. Makkouk	Craig Schwartz
Dr. Russell P. Elliott	Michael McAllister	Zhi-Liang Wei
Julie Filo	Dr. Richard A. Mikulec	Dr. Yiliang Wu
Dr. Thomas M. Houts	Maya Nag	Dr. Inn Yuk
Dr. Arul Joseph	Nhu Nguyen	

## Chemistry Quiz

This graduate of NYU and Columbia was the first African-American woman to receive a Ph.D. in chemistry in the United States in 1947. Her dissertation addressed "A Study of the Products Formed by the Action of Pancreatic Amylase on Corn Starch." What was her name?

### Last Month's Question:

The small molecule with the formula  $C_8H_{16}O_2$ , is in clinical use as an anti-convulsant and mood-stabilizer in the treatment of epilepsy, bipolar disorder, and prevention of migraine headaches. What is its name and chemical structure?





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## FUTURE MEETINGS

- Apr 18** CalDay at the Lawrence Hall of Science  
[www.lawrencehallofscience.org/visit/events](http://www.lawrencehallofscience.org/visit/events)
- Apr 18** Hayward Fault Walking Tour  
<http://msnucleus.org/haywardfault/hayward.html>
- Apr 24** Dr. David Sopchak, San Jose State University  
Fuel Cells: Concepts, Implementations  
and Practicalities  
Mission College - Hospitality  
Management Building
- May 2** Free Community Day at CuriOdyssey  
[www.curiodysey.org/activities/family-events/community-days](http://www.curiodysey.org/activities/family-events/community-days)
- May 10** Mother's Day  
Free Admission at the Exploratorium  
<http://www.exploratorium.edu/>
- May** Dinner Meeting - TBD
- Jul 11** Annual Wine Tasting, Family Picnic and Awards  
Ceremony to honor our 50 year members  
Stanford Chemistry Department