

# Silicon Valley Chemist

Santa Clara Valley Section

American Chemical Society

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## March Dinner Meeting Microscale Chemical Analysis Can We Make a Laboratory on a Chip?

### Abstract

Dr. Rakestraw will review the history, current status and future of microscale chemical analysis systems. Key applications of this technology in drug discovery, drug development, proteomics and biological weapons detection will be discussed.

### Biography

David Rakestraw received a B.S.

degree in Chemistry from Ohio Northern University (1983) and a Ph.D. in Chemistry from Stanford University. From 1988 to 2000, Dr. Rakestraw worked at Sandia National Laboratories where he was engaged in a wide range of research and development activities. Early research activities lead to Dr. Rakestraw receiving the Coblenz Award for his pioneering work in developing nonlinear spectroscopic methods for trace species detection in 1995. During the 98-99 academic year, Dr. Rakestraw took a sabbatical from Sandia to

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## Reminder February Dinner Meeting

Our February dinner meeting will be held on **Thursday, February 21st**. Dr. Harry Cook of the United States Geological Survey will give a talk on his adventurous oil field expeditions in Asia. The dinner will be held at the Biltmore Hotel and Suites in Santa Clara. For last-minute details and reservations, log onto our website **[www.scvacs.org](http://www.scvacs.org)** by February 21st. Hope to see you there!

## March Dinner Meeting

**Date:** March 21, 2002

**Time:** 6:00 pm Social Hour  
7:00 pm Dinner  
8:00 pm Presentation

**Location:** Biltmore Hotel & Suites  
2151 Laurelwood Road  
Santa Clara, CA  
(408) 988-8411

**Speaker:** Dr. David Rakestraw  
Eksigent Technology  
Sensors for Chemical and  
Biological Agents

**Cost:** \$25 with choice of Chicken  
Toscano - Stuffed with  
walnuts and artichokes, or  
Vegetarian Stew - served in  
a sourdough bread bowl.

**Reservations:** Shirley Radding  
(408) 246-2564  
(408) 296-8625 FAX  
**[www.scvacs.org](http://www.scvacs.org)**

Reservations should be made by March 18th; stating your name, company affiliation, number of people in the party and the meal preference.

## Chair's Message

The other night, my wife and I were solving word puzzles that consisted of scrambled occupations with missing letters. One puzzle consisted of the letters TIMSHC. I kept trying to make it into BLACKSMITH, but it required too many letters. When my wife looked at me struggling with this puzzle, she shook her head and gave me that "you poor boy" look as she wrote down CHEMIST. Even though I missed the puzzle, chemistry was not far from my mind as the next day was the first day of classes for the new quarter.

I enjoy teaching students new to organic chemistry. With fresh eyes they can look at the material from new points of view. I can still be caught off guard by questions that make connections and analogies that are quite novel. Many of these students get excited by chemistry despite themselves. They signed up for the course to fulfill a requirement for their major. They heard the student rap about organic and don't expect to like it. But here they are, nonetheless passionate and involved with the material. I think what catches most of them is the cohesive and systematic nature of organic chemistry. Where general chemistry was a patchwork of important but not necessarily related concepts, organic is a whole cloth.

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*Chair's Message, continued from front page*

Many of the students who get turned on to chemistry have come from good schools with strong math and science programs. I wonder about the less fortunate students from poor school systems. Will they ever get a chance to be excited by science? Some will, thanks to programs like the Carver Kidvention and the people who help put them on like Howard Peters, chair of our Committee on Minority Affairs. The Carver Kidvention, held on January 5th this year, introduces youngsters to science through hands-on workshops, and problem-solving exercises. It gives them an opportunity to develop and then present their own inventions.

It's not only the poor science education that makes it tough for budding scientists but society's general attitude towards science. While society and the media are fascinated with science's technical achievements, there is much less interest in the basic science from which the technology grew. We each can take a small stand against this trend. Come attend our local section dinner meetings.

The meetings' talks cover scientific issues geared towards a general audience. The food and company are excellent. How will attending the dinner help educate the public? Share your thoughts on the talk at the water cooler and the dinner table with your children. Better yet, bring your junior high and high schoolers to the talk. Remember, the talk is free. What issues will be covered?

In the next two months we are lucky to have two topical speakers. This month on the 21st, Dr. Harry Cook from the U.S. Geological Survey will speak about oil exploration and field expeditions in Central Asian countries bordering Afghanistan. In March, Dr. David Rakestraw of Eksigent Technology will give a talk on microscale chemical analysis systems, discussing their applications in drug discovery and development, proteomics, and biological weapons detection. A few years back, when Dave taught analytical chemistry at Stanford, he loaned me a chemical

## Carver Science Fair, Kidvention, and Recognition Day

Many ACS local sections have not created a formal Committee on Minority Affairs to further the work started in 1993 by ACS national. The Santa Clara Valley Section has had a Committee since 1997, with Dr. Howard Peters, a Palo Alto chemical patent attorney, as the first chair. Earlier work resulted in a resolution in 1997 from the ACS Board and Council endorsing the creation of an Official State Day of Recognition in all states to recognize the contributions



*Gathering for Carver Science Fair*

of the renowned agricultural chemist, Dr. George Washington Carver. By cooperating and partnering with the local African American directed Healing Institute, the ACS Santa Clara Valley Section provided some documents that were helpful in making California the tenth state to create



*Overview of the Kidvention.*

State Day of Recognition to honor Dr. George Washington Carver. The founder and director of the Healing Institute is Halim Mustafa, the community entrepreneur and a former policeman from East Palo Alto, California.

After much planning and many volunteer hours, the Healing Institute, in partnership with Intel Corporation, Cypress Semiconductor, Microsoft, the Santa Clara Alliance of Black School Educators, the Santa Clara Valley Section of the ACS, and others created the Carver Scholars with over 250 African American grade and high school students in the Silicon Valley. This program won the Healing Institute a special award in 1999 from the U.S. Congress for the best public or private program to encourage

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sensor chip to show my chemical separations class. It really turned them on to see and learn about cutting edge chemistry in action.

While I may forget the name of my profession while puzzle solving, I won't forget the importance of educating students and the general public. I hope you won't either.

I look forward to seeing you at our dinner meetings.

*Jon Touster*



*Microscale Chemical, continued from front page*

become a Consulting Associate Professor of Chemistry at Stanford University. Over the past six years Dr. Rakestraw has been engaged in microscale chemical analysis and microfluidic research. This research

was focused toward the development of detection systems for chemical and biological weapons that might be used by terrorists. Key scientific accomplishments in the area of microfluidics include the discovery of high pressure electrokinetic pumping and the development of a new microscale fluid imaging technique. In 2000, Dr. Rakestraw left his position as a Distinguished Member of the Technical Staff at Sandia to start Eksigent Technology with 5 other colleagues. At Eksigent Technology Dr. Rakestraw is developing microscale chemical analysis systems that can be applied to a range of commercial applications such as drug discovery/development, medical diagnostics and general trace chemical analysis.

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minority students in science and engineering.

On January 5, 2002, the Healing Institute and its partners cooperated to hold the third Carver Science Fair primarily for African American students of the Silicon Valley at the Santa Clara Convention Center. Over 150 students participated. About half of the science fair judges were local ACS volunteers. A special thanks is due again to Sally Peters, Howard Peters, Hugh Dubb, Jack Riley, Bruce Raby, Yvonne Butler (of NASA), Art Diaz and his wife, Linda Brunauer (and Bernie), Jamil Talhouk, Herb Silber, Ferenc Makra, Patricia Takahara, Cam Ainsworth, Carl Shoemaker and Chuck Ullman. We couldn't have



Howard Peters spending time with an audience of aspiring scientists and engineers.

done it would their assistance. It is anticipated that many of these first time exhibitors will now exhibit their science project in the local mainstream science fairs.

Ten Santa Clara Valley local section members also organized a Carver KidVention, a program to focus children (in this case 60, K - 5th grade students) what inventions were all about, and that you did not need to be a rocket scientist to be an inventor.

The Carver Recognition Day and Carver Science Fair Award dinner in



Sally Peters works with the students to devise a plan for their creations.



Carver Day Science Fair setup.

the evening mentioned a special videotaped address by Past President Bill Clinton. The Past President praised the many contributions of Dr. Carver, often in the face of adversity, and congratulated the Healing Institute and its partners in Santa Clara for their pioneering volunteer efforts to encourage minority students in science and engineering.

The Healing Institute (with some assistance by the partners) was instrumental in having January 5th added to the Congressional calendar to honor

Dr. Carver. This means that each January 5th federal buildings across the country will display their flags at half-mast to honor Dr. Carver.

Future cooperative projects for the partners include having each of the 50 states declare a Carver Recognition Day each January 5th, having many Carver recognition events around the nation, expanding the Carver Scholars and Carver Science Fair Programs throughout California and the nation, and encouraging the U.S. Treasury to recognize the important contributions of African American chemist Dr. George Washington Carver by issuing a new U.S. coin or U.S. currency for general circulation honoring Dr. Carver. It will be a powerful statement for a minority to be able to go to the local store to buy the paper, a loaf of bread, and milk using newly minted Carver coins and currency!



Ah, the finished product!

## Editor's Corner

Several members have contacted me on changing their addresses to expedite the delivery of their monthly newsletters. Since National generates our mailing list, you will need to contact Member & Subscriber Services by telephone, letter, fax, or e-mail. Customer service representatives are available to speak with you by telephone Monday through Friday (except holidays) from 8:30 am to 5:00 pm, Eastern Time. You may also use National's online change of address form.

Please note: Because labels for issues of all publications are generated ahead of mailing, please allow a minimum of 2 to 3 weeks before your issues will be sent to your updated address.

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Looked upon by Linda Brunauer and Ean Warren at the January ExComm Meeting, Howard Peters can't seem to keep some holiday chocolate out of his hands (or his mouth!).

# The Fifth Annual Paul Flory Conference on Physical and Macromolecular Chemistry

February 22, 2002, Stanford University

PROGRAM COMMITTEE: Professors Michel Boudart, Chris Chidsey,  
Gerald Fuller, Alice P. Gast, Vijay Pande, Robert Waymouth

## **INVITED SPEAKERS:**

- Keynote Speaker: Professor Alan Heeger, Nobel Laureate in Chemistry, University of Santa Barbara, "Ultrafast Photoinduced Electron Transfer: From Photodetectors and Solar Cells to Bio-specific Sensors"
- Professor Stacey Bent, Stanford University, "Integrating Organic Materials with Silicon and Germanium"
- Professor Joseph DeSimone, University of North Carolina, Chapel Hill, "The Carbon Dioxide Technology Platform: From Self Assembly in Compressible Media to Totally Dry Lithography in Microelectronics Processing"
- Dr. Howard Turner, SYMYX Technologies, "Recent Advances in Olefin Polymerization Catalysis and Combinatorial Chemistry"
- Professor Christopher Viney, Herriot-Watt University, Edinburgh, "Supramolecular Liquid Crystallinity in Natural and Synthetic Materials"
- Professor Juan De Pablo, University of Wisconsin, "The Glass Transition and Mechanical Behavior of Nanoscopic Polymeric Structures"
- Professor Ken Dill, University of California, San Francisco, Dinner Speaker, "The Flory Theorem and its Impact on Protein Folding"

## **POSTER SESSION:**

- Outside Registrants, Students, Postdoctoral Fellows, and Faculty in Chemistry and Chemical Engineering.

## REGISTRATION INFORMATION

<http://www.stanford.edu/dept/chemistry/floryreg.html>

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## 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 2002 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 American Chemical Society through elected or appointed positions at local, regional and national levels.

The award consists of an honorarium of \$1,000 and a suitably inscribed memento. Nominations should consist of at least one letter of nomination stating how the nominee's work relates to all aspects of the award. It is recommended that seconding letters accompany the nomination. Nominations are due on or before April 1, 2002, and must be mailed to:

**Radding Award Committee**  
Santa Clara Valley Section ACS  
P. O. Box 395  
Palo Alto, CA 94302



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#### **CHEMPLOYMENT ABSTRACTS**



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### **Chememployment Abstracts**

Director: **Shirley B. Radding** 408-246-2564 [sradding@att.net](mailto:sradding@att.net)

## **FUTURE MEETINGS**

<b>Feb 6</b>	Executive Committee Meeting
<b>Feb 21</b>	SCV Dinner Meeting <i>Dr. Harry Cook, USGS</i>
<b>Feb 24-27</b>	Process Chemistry in the Pharmaceutical Industry Barcelona, Spain
<b>Mar (TBD)</b>	Chemistry Olympiad
<b>Mar 17-22</b>	Pittcon 2002 New Orleans, LA
<b>Mar 21</b>	SCV Dinner Meeting <i>Dr. David Rakestraw</i>
<b>Apr 7-12</b>	National Meeting Orlando, FL
<b>Apr 25</b>	SCV Dinner Meeting <i>Dr. Michelle Marvier</i>
<b>May 23</b>	SCV Dinner Meeting <i>Bob Roudon</i>

For the latest information, please visit  
SCV/ACS web site: [www.scvacs.org](http://www.scvacs.org)



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