ACS Chemistry for Life™

SCALACS

October 2012

A Joint Publication of the Southern California and
San Gorgonio Sections of the American Chemical Society

Southern California Section Dinner
Celebrating National Chemistry Week

The Ultimate Limits of Miniaturization: Exploring and Controlling the Nanoscale World in Science, Engineering, and Medicine

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ACS Chemistry for Life™

SCALACS

A Joint Publication of the
Southern **Cal**ifornia and San Gorgonio Sections of the
American **C**hemical **S**ociety

Volume LXV October 2012 Number 6

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SCALACS (ISSN) 0044-7595 is published monthly March through May, September and October; and Bi-monthly January/February and November/December along with a special ballot issue once a year. Published by the Southern California Section of the American Chemical Society at 14934 South Figueroa Street, Gardena CA 90248. Subscription price is $12.00/year. Make checks payable to Southern California Section, ACS. Second Class postage paid at Gardena, CA 90247, email: office@scalacs.org.

ADVERTISERS: Advertising rates on application. Mail COPY, CONTRACTS and CHECKS to Southern California Section, ACS, 14934 South Figueroa Street, Gardena, CA 90248.

CONTRIBUTORS: Send all copy to Editor, SCALACS, 14934 South Figueroa Street, Gardena, CA 90248, email: editor@scalacs.org.

POSTMASTER: Send change of address to SCALACS, 14934 South Figueroa Street, Gardena, CA 90248.

Website address: www.scalacs.org

Southern California Section

Chair's Message

The Original Chemistry Ambassadors . . .

Greetings!

You have been right there from the beginning. You share the wonders of chemistry, impact public policy, and you support fellow ACS members and non-members. You are leaders in industry, government, and academia.

Take a look in the mirror – You are a Chemistry Ambassador!

As chemists, you help solve some of the world's biggest challenges and improve people's lives through the transforming power of chemistry. As ACS members you have taken your dedication to another level. By joining you make an investment in the future of chemistry and most importantly an investment in **chemists**. Anything that you do to share chemistry, no matter how simple, makes you a chemistry ambassador. I encourage you to share your activities with us. To find out more about the Chemistry Ambassador program, please visit: www.acs.org/chemistryambassadors

We have several great events this month and I encourage you to participate. On October 6th our Education Chair Michael Morgan is hosting a workshop for chemistry teachers at Occidental College. Senior Chemists Chair Henry Abrash is organizing National Chemistry Week activities at the California Science Center and Chair-Elect Brian Brady is organizing an NCW themed dinner meeting on October 18th. Our speaker will be Professor Paul Weiss from UCLA. His talk is titled: The Ultimate Limits of Miniaturization: Exploring and Controlling the Nanoscale World in Science, Engineering, and Medicine.

Don't wait another nanosecond – join us!

Happy NCW25,

Bob de Groot
rdegroot@oxy.edu
Celebrate NCW 2012 (October 21–27): "Nanotechnology: The Smallest BIG Idea in Science!"

Southern California Section

October Dinner Meeting

Thursday, October 18, 2012

at

Taix French Restaurant

1911 W. Sunset Boulevard
Los Angeles, CA 90026

The Ultimate Limits of Miniaturization: Exploring and Controlling the Nanoscale World in Science, Engineering, and Medicine

Paul S. Weiss

California NanoSystems Institute and Departments of Chemistry & Biochemistry and of Materials Science & Engineering
University of California, Los Angeles

6:15 p.m. Check-in
7:15 p.m. Dinner
8:15 Presentation

Abstract: Since we have learned to measure the precise structures, environments, interactions, and functions of molecules at the nanoscale, we are now learning to direct molecules into desired positions to create nanostructures, to connect functional molecules to the outside world, and to serve as test structures for measurements of single or coupled molecules. Hierarchical patterning enables simultaneous control at many levels, all the way from the macroscale through the microscale, ultimately to the subnanometer scale. Interactions within and between molecules can be designed, directed, measured, understood, and exploited. We examine how these interactions influence chemistry, dynamics, structure, electronic function, and other properties. Such interactions can be used to advantage to form precise molecular assemblies, nanostructures, and patterns, and to control and to stabilize function. By understanding interactions, function, and dynamics at the smallest possible scales, we hope to improve synthetic systems at all scales. We are also using these strategies to control and to understand interactions, function, and structures of biological systems. I will discuss upcoming opportunities to make inroads into refractory problems in biology and medicine, and will discuss our first results and strategies in these areas.

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Southern California Section

October Dinner Meeting (Continued from Page 3)

Biography: Paul S. Weiss is director of the California NanoSystems Institute, Fred Kavli Chair in NanoSystems Sciences, and distinguished professor of chemistry & biochemistry and of materials science & engineering at UCLA. He received his S.B. and S.M. degrees in chemistry from MIT in 1980 and his Ph.D. in chemistry from UC Berkeley in 1986. He was a postdoctoral member of technical staff at Bell Laboratories from 1986-1988 and a visiting scientist at IBM Almaden Research Center from 1988-1989. Before coming to UCLA in 2009, he was a distinguished professor of chemistry and physics at the Pennsylvania State University, where he began his academic career as an assistant professor in 1989. His interdisciplinary research group includes chemists, physicists, biologists, materials scientists, mathematicians, electrical and mechanical engineers, and computer scientists. Their work focuses on the atomic-scale chemical, physical, optical, mechanical and electronic properties of surfaces and supramolecular assemblies. He and his students have developed new techniques to expand the applicability and chemical specificity of scanning probe microscopies. They have applied these and other tools to the study of catalysis, self- and directed assembly, physical models of biological systems, and molecular and nanoscale devices. They work to advance nanofabrication down to ever smaller scales and greater chemical specificity in order to connect, to operate, and to test functional molecular assemblies, and to connect these to the biological and chemical worlds. Two current major themes in his laboratory are cooperativity in functional molecules and single-molecule biological structural and functional measurements.

Reservations: There is a choice of Coq au Vin (chicken with wine sauce) or Beef Bourguignon for dinner. The cost of the dinner is $31 per person including tax, tip, and wine with dinner; cash or check at the door. Please call Nancy Paradiso in the Section Office at 310 327-1216 or email office@scalacs.org by Monday, October 15, 2012 for reservations.

Directions: To access Google maps from their website, go to http:// taixfrench.com/contact-us/

Southern California Section

Saturday, October 6, 2012

SCALACS High School Chemistry Teachers Meeting

Occidental College
Bioscience Room 113
1600 Campus Road
Los Angeles, CA 90041

Registration Opens 8:00 a.m.
Program 9:00 a.m. to 3:00 p.m. (lunch included)

2012 theme of National Chemistry Week is Nanoscale Science and Engineering

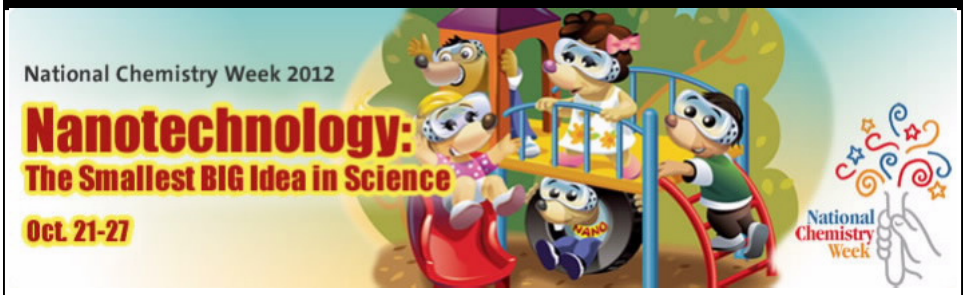
For many years the Occidental Chemistry Teachers Meeting was the premier place in Los Angeles for teachers to learn from teachers. Please consider coming and sharing your favorite lesson, demo, or trick with us. Already confirmed speakers include Larry Walker (Calabasas), Ken Mukai (El Camino), Richard Erdman (Venice), Larry Quimby (Bravo), Lanny Larsen (Bravo), Michael Morgan (Bravo) and more! Barbara Sitzman (Granada Hills) will be presenting on the new ACS Guidelines for High School Chemistry. For a list of presentations, see our website, www.scalacs.org. Anyone interested in presenting please contact the program chair, Michael Morgan at mmorgan@lausd.net.

Cost: There is a $25 cost for the program which includes lunch (cash or check).

Registration: To register, please contact Nancy Paradiso in the Section Office at office@scalacs.org or call 310 327-1216 by October 5th.

There is free parking on campus.

Sponsored by SCALACS, Occidental College and TOPS Program



NCW Outreach Activities

October 21-27, 2012 (Varying Times) National Chemistry Week Activities at the California Science Center, 700 Exposition Park Drive, Los Angeles, CA 90037, website: www.californiasciencecenter.org. Join volunteers at the California Science Center for NCW activities throughout the week. The theme for NCW2012 is "Nanotechnology: The Smallest BIG Idea in Science!" For more information visit: www.acs.org/ncw. If you would like to volunteer or have questions, please contact Henry Abrash at: abrash8@aol.com.

Chair Herb Kaesz (with balloons) and Sofia Pappatheodorou at the first National Chemistry Day in 1987 with 50 year members

Other Events of Interest

October 6, 2012: UCLA Celebration of the 100th Birthday of Saul Winstein, 9 am-5:30 pm. Reception and Dinner following at the Faculty Center. Details of program can be found on UCLA Chemistry Home-page, http://www.chemistry.ucla.edu/ Contact Ken Houk at houk@chem.ucla.edu for reservations.

October 9, 2012: **CSUN Women in Science and Engineering (WISE) Networking Event** at CSUN Oviatt Library. Professional Organization Presentations 3-5 pm, Speed Mentoring 4-6 pm. For information, call 818 677-2638

Call for Nominations
OUTSTANDING HIGH SCHOOL CHEMISTRY TEACHER OF THE YEAR AWARD

If you know of a local high school chemistry teacher who is making a difference, please make the effort to show how important his/her work is to you and the students. Self-nominations from those who feel they fit the requirements are accepted as well. It's teachers like the recipients of this award who make learning chemistry rewarding. Plus, there is a financial component of $500. The $500 will be an unrestricted award directly to the teacher. The winner of the Section Award will also be entered at the National ACS level for the James Conant Bryant Award and the Western Regional High School Teacher of the Year Award. Having won a previous award does not necessarily exclude a nominee, however, the nomination would need to be based on different criteria than the first award.

Nomination Package should include: Biographical sketch of nominee with date of birth, list of any publications, statement (no more than 1,000 words) of nominee's achievements as a high school chemistry teacher including quality of teaching, effective methods, nominee's ability to challenge and inspire students, extracurricular work (science fairs, clubs, etc.). Seconding letters are not essential, but up to five may be included. **Nominating documents may be submitted via email to office@scalacs.org.** Note that signed documents that have been scanned are acceptable.

The deadline for nominations is **November 15th, 2012**. Please feel free to contact Michael Morgan of the Educational Affairs Committee at mmorgan@lausd.net if you have any questions.

This Month in Chemical History

Harold Goldwhite, California State University, Los Angeles
hgoldwh@calstatela.edu

Russian organic chemists of the nineteenth century tend to be underappreciated by cursory students of chemical history, but their contributions were impressive. A new book: "Early Russian Organic Chemists and Their Legacy" by David E. Lewis of the University of Wisconsin Eau-Claire redresses the balance. In this column I will draw on Professor Lewis's book to describe the career and influence of Aleksandr Mikhailovich Butlerov.

Butlerov was born on September 6, 1828 into a military family, of minor nobility, in Chistopol in what was then the province of Kazan in central Russia. He attended the Gymnasium in Kazan and then Kazan University from 1844 to 1849. Initially a chemistry student who studied with Zinin (see my previous column) and Klaus he turned to entomology when Zinin left for St. Petersburg. Though his first dissertation was on butterflies he was pressed into service instructing chemistry after Zinin's departure. His M. Chem. from Kazan and later his Dr. Chem. dissertation at Moscow were both on historical work and remained unpublished.

After teaching chemistry for a few years he was given leave to broaden his chemical training. He met Kekule and Erlenmeyer, spent six months in Wurtz's laboratory in Paris, learned of the work of Gerhardt and Laurent, and eventually abandoned Berzelius' dualistic theories and became a proponent of the new directions in organic chemistry. He returned to Kazan in 1858 and was appointed Professor. He modernized the laboratories and insisted on practical work for chemistry students. The curriculum at Kazan was soon on a par with those in Western Europe and a number of Kazan students including Markovnikov and Zatisev went on to Professorships at other Russian universities.

Butlerov served two short terms as Rector of Kazan University; tensions between students and his administrations led to those terms being brief. In 1868 he moved to a Chair at St. Petersburg where he remained for the rest of his career.

A structural theory of organic compounds had been proposed independently by Kekule and Couper around 1858, shortly after Butlerov left Paris. Butlerov at first rejected but then became a convert to the new ideas and presented his views at a conference in Germany in 1861. He ***(Continued on Page 9)***

This Month in Chemical History

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stressed that each organic compound had a unique structure – a novel idea for the time. He used his views not solely to develop structures for known compounds but also to create synthetic routes to novel compounds. His most striking achievement was to predict the existence of tertiary alcohols; until this time only primary and secondary alcohols had been identified. Butlerov synthesized tertiary butanol by two different routes: reaction between phosgene and dimethyl zinc (a Frankland reagent); and reaction between acetyl chloride and dimethyl zinc. The resultant tertiary alcohol resisted mild oxidation, as he had predicted. He then generalized this synthesis of tertiary alcohols from carboxylic acid chlorides and dialkyl zinc reagents.

Butlerov's synthetic work covered a wide range. In Wurtz's laboratory he prepared methylene iodide and hexamethylenetetramine. Work at Kazan included the polymerization of formaldehyde in dilute basic solution to give a mixture of carbohydrates which he called "formose" and which was later shown to contain ribose. This reaction has been invoked by students of prebiotic chemistry as a possible non-biological route to carbohydrates.

Interestingly, despite his observations on the uniqueness of organic structures, studies by Butlerov of alkene polymerization led him to the suggestion that there might be the possibility of dynamic equilibrium between structural isomers, a concept that was later established as tautomerism.

At St. Petersburg, Butlerov supported the Russian group in the Academy of Sciences (of which he was a full member) in their disputes with the pro-German group. He resigned his Chair in 1880 and returned to his family estates where he carried on research on atomic weights and pursued his interests in spiritualism and bee-keeping (shades of Sherlock Holmes!). He died on August 17, 1886.

Councilor Talking Points Highlights Spring National Meeting in Philadelphia

Due to space constraints, we are not printing the Councilor Talking Points from the ACS National Meeting in Philadelphia. Please go to our website, http://scalacs.org/?page_id=44 for the complete report.

San Gorgonio Section

Chair's Message

The Value of ACS Membership

An acquaintance recently mentioned that he had canceled his ACS membership because he felt that he didn't get value out of it. As a working professional with a wife and three young children, he didn't go to meetings and rarely had time to read journals. This gave me pause, since I recently attended the fall meeting in Philadelphia and almost always read C&E News. I knew that ACS membership had more to offer than meetings and publications. This conversation provided a challenge that required some experimentation! The obvious starting point for said experiment was the ACS website. After a fulfilling evening surfing the site, my hypothesis was validated!

In response to the conversation mentioned above and since this is "Back to School" season, I want to share some features on the ACS website that provide value for busy chemists with families. The ACS website has engaging, relevant material for students from kindergarten to high school. Looking for an interesting science topic for dinnertime conversation? Check out "**Everyday Chemistry**" on the ACS homepage. The topic this week is "Windows that Generate Electricity". Or access the **Climate Science Toolkit** which provides information about the basic science of climate change.

For those who would like some **hands-on activities for elementary age children**, type "**Science for Kids**" in the search box on the homepage. Click "Science for Kids" in the search results. There are eight headings on the "Science for Kids" page, each with an arrow titled "view activities". Clicking "view activities" will provide access to a plethora of activities that can be done with common household items. Each activity includes explanation of the science and safety cautions. The activities are in PDF form and downloadable.

For students in grades six through eight, go to the ACS homepage and click "Education". On the left side, click "Educational Resources". Scroll down to "Lesson Plans, Activities, Articles, Demonstrations" and then click "**Middle School Chemistry**". This opens up a complete chemistry curriculum for sixth through eighth graders, including lesson plans, animations, activities and reading materials. Most of this is in downloadable, PDF format.

For the high school crowd, try "**Bytesize Science**" which contains short videos about science current events (think YouTube). It can be accessed from the "Pressroom" page or at http://www.bytesizescience.com. The successful landing of the Mars Curiosity Rover has captivated the imagination of children

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San Gorgonio Section

San Gorgonio Section
Annual Meeting
(So Important, It's Worth Repeating!)

Wednesday, October 3, 2012
7:00 p.m.

University of California, Riverside
Chemical Sciences Bldg, Room 231
900 University Avenue
Riverside, CA 92521

Come celebrate the start of our new year. At the meeting we will vote to approve our updated bylaws, honor our 50 year and 60 year members, welcome new Section members, and recognize **Dr. Ernest Simpson,** recently elected as an ACS Fellow. An overview of Section activities for the upcoming year will also be presented and we will brainstorm the needs, suggestions, comments, and other items to improve the Section. Dr. Cynthia Larive will also tell us what's new at UCR. Food (sandwiches, fruit, cheeses, water, and sodas) will be provided. There will also be a drawing for a variety of door prizes.

Meeting Agenda:

Welcome
Approval process of the revised Section bylaws.
The revised bylaws can be reviewed on the Section website http://sangorgonio.sites.acs.org/. If you would like a paper copy of the bylaws to review, contact Eileen DiMauro (email: edimauro@mtsac.edu, phone: (909) 594-5611x4533) and leave your name and mailing address.
Recognition of 50 year and 60 year ACS members
Recognition of new Section members
Recognition of Dr. Ernest Simpson – ACS Fellow
Overview of upcoming Section activities – National Chemistry Week, High School Chemistry Olympiad
Brainstorming: How to improve the San Gorgonio Section
What's New at UCR – Dr. Cynthia Larive, Professor and Chair, Department of Chemistry
Door prize drawings
Adjournment

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San Gorgonio Section

October Dinner Meeting (Continued from Page 11)

Reservations: Please RSVP to edimauro@mtsac.edu or dpedersn@csusb.edu **no later than** Monday, October 1.

Parking: The UCR Chemistry Department will pick up the parking cost for participants at this meeting; THANK YOU. Carpools are encouraged. Get to the campus and go to the main information kiosk at the main entrance on West Campus Drive. Tell the parking person that you are a participant in the ACS meeting in the Chemical Sciences Bldg and obtain a parking permit and directions to the meeting site and a campus map.

Directions: UCR is located off the 215/60 freeways in Riverside at the University Avenue exit. Consult the campus website for a detailed area map, showing various ways of getting to the campus. http:// campusmap.ucr.edu/imap/index.html.

Chair's Message (Continued from Page 10)

young and old. There is a video on the webpage; "Chemistry On Mars: The Curiosity Rover's Mission to Uncover Martian Habitability" that explains some of the scientific instrumentation on the Rover. Does your family love fireworks? Access the video "The Chemistry of Fireworks" for an explanation of the chemistry in action.

For high school students who are considering taking the **Olympiad Exam** next spring, they can begin preparing now! On the ACS homepage, click "Education". On the left side, under "Students", click "High School". On the page that opens, click "Chemistry Olympiad". Once this page opens, click "past exams". Local and national exams from the last ten years are available in downloadable, PDF format.

There are many more benefits available to ACS members than meetings, publications and what is shown above. The ACS website is easy to navigate and search. I recommend that you repeat my experiment and spend some time surfing the site. Hopefully, you will find my results reproducible!

- Eileen DiMauro,
San Gorgonio Section

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IMPORTANT
Do Not Delay!

Contains Dated Meeting Announcement

PERIODICAL

Bi-Section Chemists' Calendar

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Happy National Chemistry Week!