



September 2015

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

## **Southern California Section Meetings**

College Lecture Series Featuring Dr. Krishna Kallury California State University, Long Beach Tuesday, September 1, 2015 See Page 3

Luncheon Honoring our 50 and 60 Year Members With a Special Presentation by Our Project SEED Students At Stevens Steakhouse Saturday, September 19, 2015 See Page 4

San Gorgonio Section Luncheon

A Special Invitation to High School Chemistry Teachers Come and Learn How Involvement with the American Chemical Society Can Help You and Your Students Saturday, September 19, 2015 See Page 12

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# SCALACS

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

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Chair: Veronica Jaramillo Chair Elect: Michael Morgan Secretary/Treasurer: Barbara Belmont

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#### TABLE OF CONTENTS

So. Cal. Chair's Message	2
So. Cal. Meetings & Notices	3-7
This Month in Chemical History	8-9
IP Law	10
S. G. Chair's Message	11
S. G. Meeting Notice	12-13
Chemists' Calendar	bc

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## Chair's Message

As summer ends we find ourselves gearing up for the fall. Some of us are preparing for the next semester, others are excited to start classes and others continuing in their research. In this time there is reflection of the past and planning for a better future. So in this message I will start with

some recognition, followed by announcing our September meeting and end with longer term plans.

I would like to congratulate three of our SCALACS family: Robert-Michael (Southern California Earthquake Center, University of Southern deGroot California) Anna Krylov (University of Southern California) and Barbara Sitzman (Chatsworth Charter High School and SC Councilor). Robert-Michael deGroot was named a 2015 ACS fellow for his research, teaching, and outreach to our community. He has served on the Committees on Community Activities and Public Relations and Communications for the ACS and is a past chair for SCALACs. Anna Krylov was also named a 2015 ACS fellow for her development of new robust tools for electronically excited and open-shell species, such as the spin-flip approach for polyradicals and complex-variable coupled-cluster methods for metastable electronic states. She created a webbased list of women in theoretical and computational molecular sciences, which encourages young women to pursue careers in this field. Barbara Sitzman was appointed to serve as the Inaugural President of the American Association of Chemistry Teachers (AACT) by the ACS Board of Directors. Great Job!

Our section will open the fall program with recognition of our 50 and 60 year chemists on September 19 at Stevens Steakhouse. See page 4 for details. We will also have presentations from our Project SEED students on that day. Hope to see you there!

October will bring many activities in celebration of National Chemistry week (October 18-24, 2015). This year's theme is: **Chemistry Colors our World**. We are holding a local Illustrated Poem Contest for K - 12 students (see page 7 and our web site for details). We are also planning outreach and social activities as well as our second Chemistry Bowl for our Undergraduate Student Clubs.

Finally, please mark your Calendars for the 45<sup>th</sup> Western Regional ACS meeting which will be held from November 6-8, 2015 in San Marcos, CA.

We would love to hear your ideas for our events. We are also looking for volunteers to help us with event planning. If you are interested, please email me.

Best-Veronica Jaramillo vijaramillo@pasadena.edu

## **College Lecture Series**

Tuesday, September 1, 2015 4:00 p.m.

#### California State University, Long Beach, Hall of Science (HSCI), Room 102

1250 N Bellflower Blvd, Long Beach, CA 90815

#### "FOOD CHEMISTRY AND ITS ROLE IN THE SCIENCE OF FOOD" Dr. Krishna Kallury, Ph.D., Analytical Consultant to the Food and Pharmaceutical Industries

**Abstract**: Food Chemistry is a major aspect of Food Science and deals with the composition and properties of food and the chemical changes it undergoes during its preparation, handling, processing and storage. In the first part of this presentation, the constituents of food and their chemical composition will be discussed and a few examples of healthy food choices given. The second part deals with food regulatory agencies in the U.S.A. and what aspects are regulated. In the third part, the role of analytical chemistry in the qualitative/quantitative determination of toxic chemicals and adulterants will be presented through some concrete examples. In the fourth section, the role of organic chemistry in understanding the structure, physical properties and chemical reactions of food ingredients will be discussed with a few illustrative examples. The presentation will conclude with a brief discussion on how chemistry helps other branches of science dealing with food processing and safety.

**Biography:** Dr. Kallury obtained his Ph.D. in Chemistry at the age of 22 years, from Osmania University, Hyderabad, India, under the supervision of Late Professor N.V. Subba Rao. He received post-doctoral training at the University of London, U.K., with Prof. Alan McColl and at the University of Adelaide, South Australia, with Prof. John H. Bowie. After ten years of teaching and supervision of the research of several graduate students at Osmania University, Dr.Kallury joined the Chemistry Department, University of Toronto, Canada, first as a Research Associate and then as Professor in Chemistry and was involved in the co-supervision of research of a number of graduate students. He published over 100 scientific papers in peer-reviewed journals. Since 1996, he worked with several leading industrial organizations in the U.S.A. and generated several products and patents. He worked on applications in food chemistry for over 10 years in these industries.

**Directions:** Directions and parking information are available at http://daf.csulb.edu/maps/parking/. The closest lots are Lots 17 and 18. There is a \$5 charge for parking.

Sponsored by SCALACS and the CSULB Student Affiliate Association

## **Southern California Section**

#### September Luncheon Meeting

Saturday, September 19, 2015

## Honoring our 50 and 60 Year Members With a Special Presentation by Our Project SEED Students

at

#### **Stevens Steakhouse**

5332 Stevens Place Los Angeles, CA 90040

11:30 a.m. Check-in and Students' Poster Session 12:15 p.m. Luncheon Presentation of Certificates immediately following luncheon

We are celebrating our 50 and 60 year members and having our Project SEED students present a poster of the research they completed this summer. Project SEED takes high school students and places them in a laboratory environment to provide them an opportunity to engage in an authentic research experience. We hope our veteran members will enjoy hearing about their research.

#### Our 50 year members are:

John D. Baldeschweiler Martha K. Birnbaum Costello Leon Brown John A. Budny Ping Tzu Chang Evelyn G. Christie Gholam R. Falsafi Michael F. Furney Michael K. O'Rell Dana L. Roth James C. Schaeffer Balwant Singh Frederick G. Yamagishi

#### Our 60 year members are:

Dorothy M. Goldish R. S. Hodgson Frank S. LaViola Stanley Manatt Lambert O. Osen Gerald W. Parker Bertram Voorhees Al Zirkes

The students who took part in our Project SEED Program this summer are Judith Cuellar, Alex Mendizabal, Ethan Ortiz and Genesis Reyes Rivera. There will be a poster session of their research prior to lunch.

(Continued on Page 5)

## **Southern California Section**

**Reservations:** There is a choice of King Salmon or Prime Rib Sandwich for luncheon. The cost of the luncheon is \$22 per person including tax and tip; 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, September 14, 2015** for reservations.

**Directions:** To access Google maps from their website, go to http:// www.stevenssteakhouse.com/home/driving\_directions. There is parking in the rear of the building.

## Congratulations to our 2015 ACS Fellows!

This year, two Southern California Section members were named as part of the ACS Fellows Program as well as our former Tolman chair from the Mojave Section. They were honored at the National Meeting in Boston in August. We would like to congratulate:

#### Robert de Groot

Southern California Earthquake Center, University of Southern California and former Chair of the Southern California Section

> Anna Krylov University of Southern California

#### Joseph Mabry

Air Force Research Laboratory former Mojave Desert Section Chair and former Tolman Committee Chair

The fellows program began in 2009 as a way to recognize and honor ACS members for outstanding achievements in and contributions to science, the profession, and ACS. These three members epitomize those standards. We offer our sincere congratulations to all the ACS Fellows.

#### More Congratulations!

**Barbara Sitzman**, Councilor for the Southern California Section, has been selected by ACS Board of Directors as the inaugural President of the American Association of Chemistry Teachers (AACT). It has been Barbara's determination and commitment to high school teaching that has led to AACT's charter; we congratulate Barbara on all her efforts.

## **Southern California Section**

## In Memoriam Sandra Lamb Sanford



**Sandra I. Lamb Sanford,** 84, a retired educator, died on April 29 in Santa Rosa, California. Born in New York City, Lamb Sanford earned a bachelor's degree with highest honors in 1954 and a Ph.D. in 1959, both in physical organic chemistry from the University of California, Los Angeles. She then served as a

lecturer at UCLA; UC Santa Barbara; California State University, Northridge; and Santa Monica College. In 1969, she was named chair of the department of physical sciences and mathematics at Mount St. Mary's College (now Mount Saint Mary's University) in Los Angeles, California

Seven years later, Lamb Sanford became a part-time instructor within UCLA's department of chemistry and biochemistry. She also worked at Global Geochemistry Corp., and in 1983, she earned an M.S. in engineering management at UCLA. In 1985, she was a full-time laboratory coordinator for the undergraduate organic labs at UCLA.

After retiring from UCLA in 1993, she accepted a part-time teaching position at UC Santa Barbara. In 2002, she moved to Sebastopol, Calif., to be near family.

Lamb Sanford was a 57-year emerita member of ACS. She was a councilor for the Southern California Section from 1989 until 1996, served as its chair in 1988, and received its Agnes Ann Green Award in 1993. In 1994, she helped found the California Los Padres Section and served as its councilor from 1997 until 2002; it established a service award in her name in 2006. She was an ACS Legacy Leader, a designation given to those who include ACS in their estate plans.

Lamb Sanford was a member of the American Association for the Advancement of Science, Alpha Chi Sigma, Sigma Xi, and Phi Beta Kappa. She was active in community groups and loved sewing, crocheting, knitting, quilting, and traveling, according to her family. She is survived by her husband David Sanford, daughters Beth Lamb, Megan Timpany Hartman, son Brian Lamb, eight grandchildren and three great-grandchildren.

#### ACS 45th Western Regional Meeting (WRM2015) November 6-8, 2015

The Orange County Section is hosting the 45th Western Regional Meeting on the campus of the California State University, San Marcos campus which is located in North San Diego County. Please visit http://www.acswrm/org/ for information on submitting abstracts, becoming an exhibitor or sponsor, or to register for hotels.



## National Chemistry Week Illustrated Poem Contest

As part of upcoming National Chemistry Week activities, the American Chemical Society is sponsoring an illustrated poem contest for students in Kindergarten - 12th grade. Entries will be judged at the local section level and then be advance to the National contest for a chance at prizes there.

All poems must be no more than 40 words, and in one of the following styles to be considered: Haiku, limerick, ode, ABC poem, free verse, end rhyme or blank verse. Entries are judged based upon relevance and incorporation of the NCW theme (Chemistry Colors our World), word choice and imagery, colorful artwork, adherence to poem style, originality and creativity, and overall presentation.

All entries must be original works without aid from others. Each poem must be submitted and illustrated on an unlined sheet of paper (of any type) not larger than 11" x 14". The illustration must be created by hand using crayons, watercolors, other types of paint, colored pencils, or markers. The text of the poem should be easy to read and may be printed with a computer, before the hand-drawn illustration is added, or the poem may be written on lined paper which is cut out and pasted onto the unlined paper with the illustration. Only one entry per student will be accepted.

The deadline for entries is **October 30, 2015**. Please mail entries to: SCALACS, 14934 S. Figueroa Street, Gardena, CA 90248 or email to office@scalacs.org. Winners will receive a \$25 prize. For more information, contact the Section office at office@scalacs.org.

## **Call for Nominations**

The Nominations, Elections and Awards Committee of the Southern California Section is soliciting nominations for the election of 2016 Section officers (Chair-Elect and Secretary), members-at-large of the Executive Committee, and Councilors. If you wish to propose names (including your own) for consideration, send them to the Section Office at office@scalacs.org by **September 18, 2015**.



## This Month in Chemical History Harold Goldwhite, California State University, Los Angeles hgoldwh@calstatela.edu

In recent columns I have examined a number of themes drawing on a recent book: "The Chemists' War 1914 – 1918" by Michael Freemantle published by The Royal Society of Chemistry in the U.K. this year (2015). That war, called in the past The Great War (though it was dwarfed by World War II in geographic scope and casualty numbers), saw the involvement of chemists (and other scientists) in unprecedented numbers in forwarding the war effort on both sides of the conflict. A little appreciated aspect of the chemistry of World War I is the significant role that the element platinum played.

As an illustration of this, the Daughters of the American Revolution, a famous group of patriotic American women (the DAR), adopted in 1917, on the United States entering World War I, a pledge not to purchase or accept as gifts any jewelry items made wholly or in part from platinum. The pledge made explicit the DAR's commitment that supplies of platinum "shall be available for employment where they can do the greatest good in the service" of the war effort. A similar comment about the importance of platinum to the provision of materials of war was made in a letter from the secretary of the British Institute of Metals to the secretary of the ACS in August 1917. Both the ACS and the National Academy of Sciences added their voices to the chorus and the U.S. government decided to assume ownership of all supplies of unmanufactured platinum.

The major supplier of platinum in the early years of the 20<sup>th</sup> century was Russia which exported about 5000 kg a year to other European countries. Platinum had many uses: in making laboratory equipment for analyses; in jewelry; in photography; and in making high temperature thermocouples. But the importance of these uses was insignificant compared to the use of platinum as a catalyst in a number of industrial processes vital to the war effort in both camps.

Sulfuric acid is one of the most important of industrial chemicals; it has been stated that you can gauge the significance of a nation's chemical output by simply looking at the amount of sulfuric acid it consumes. In the early 20<sup>th</sup> century two major routes to sulfuric acid existed. The lead chamber process used oxides of nitrogen as catalysts in the oxidation of sulfur dioxide to sulfur trioxide, the penultimate stage in the production of the acid. This process was still widely used in Great Britain. The contact process used the direct oxidation of sulfur dioxide to sulfur trioxide by molecular oxygen over a platinum catalyst. This more efficient reaction was *(Continued on Page 9)* 

#### This Month in Chemical History (Continued from Page 8)

used in Germany and after 1915 was increasingly adopted in Britain. Consequently the British demand for platinum as the catalyst in the contact process grew steadily during the latter years of the war. One significant use of sulfuric acid in producing war materials is in the nitration of organic compounds to produce explosives like nitroglycerine and nitrocellulose, the components of cordite, a shell propellant; and trinitrotoluene, TNT, a high explosive.

These nitration reactions required nitric acid and platinum was also essential in producing this compound. The starting point was hydrogen from the water-gas reaction (steam over white-hot coke) and nitrogen from the air. In the Haber-Bosch process these elements combined under moderate temperatures and high pressures, over a platinum catalyst, to yield ammonia. The Ostwald reaction also used a platinum catalyst to control the oxidation of ammonia to nitrogen dioxide, a precursor to nitric acid. By 1914 both these processes were sufficiently developed by Germany so that there was no longer the dependency of that country on the importation of nitrates from Chile (a challenging voyage in World War I due to the British navy's blockade of the North Sea) to produce explosives. The ingenuity of German scientists and the store of platinum built up before and during the war kept the German war machine going for a full four years until the Armistice of November 1918.

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## Insights Into IP Law Keith Orso\*, Irell & Manella LLP

KOrso@irell.com

Some groundbreaking, innovative, or even brilliant discoveries are not eligible for patenting in the United States. So what discoveries are, in fact, patent eligible? A reader of this column recently wrote with such a question. The starting point is Section 101 of the Patent Act.

Section 101 provides that "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title."

The Supreme Court of the United States has long held that this provision contains an important, implicit exception. That exception is that laws of nature, natural phenomena, and abstract ideas are not patentable. Such subject matter has been described as among the basic tools of scientific and technological work, and the Court has insisted that they lie beyond the domain of patent protection. Were it otherwise, the Court explains, there would be considerable danger that the grant of patents would "tie up" the use of such tools and thereby inhibit future innovation premised upon them. Such an outcome would be inconsistent with the very purpose of the patent system, which is to promote the progress of science and the useful arts. Such progress can be promoted when inventors are granted patent monopolies on the inventions that result from using such tools, enabling them to profit from their inventions for a limited time in exchange for placing the inventions in the hands of the public for its unrestricted use after the patents expire. Such progress can be stifled, however, if the very tools that generate such inventions can also be so monopolized.

But is it not the case that all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas? Yes, and that is why the rule prohibiting patents on naturally occurring things is not without its limits. The Court recognizes that too broad an interpretation of the implicit exception also would be inconsistent with the patent system. Indeed, it could eviscerate patent law. Patent protection, the Court has stated, must strike a delicate balance between creating incentives that lead to creation, invention, and discovery, and impeding the flow of information that might permit, or indeed spur, invention. The contours of this delicate balance will be explored in future columns.

Please email korso@irell.com with desired topics for the future.

\* The author earned engineering and chemical engineering under-graduate and graduate degrees, and is a patent attorney and partner at the law firm of Irell & Manella LLP. This column does not constitute legal advice and does not necessarily reflect the views of the firm or its clients.

## San Gorgonio Section



## Chair's Message

Over the past couple of days, there have been two pervasive topics in the media: it is back-to-school time and the Presidential election season is in full swing. My email inbox is awash with missives regarding recruitment and retention of girls and women in STEP disciplines. Meanwhile, the realistic possibility of electing a woman to the highest office in the

country is generating a great deal of enthusiasm. Somehow these two unrelated topics managed to merge in my subconscious, resulting in the compilation of the following information and statistics.

What is the trend regarding participation of women chemists in the U. S. workforce?

	2007	2015
Women as a percentage of workforce	46.3%	46.9%
Women chemical engineers	17.1%	17.7%
Women chemists and material scientists	34.1%	44.2%
Women chemical technicians	35.9%	29.9%
ACS women members in the workforce	25.5%	29.9%

How do women chemists fare in regard to recognition?

	<u>1985-1999</u>	<u>2000–2015</u>
Women Laureates – Nobel Prize in Chemistry	0.0%	6.7%
Women Perkins Medal Winners Women Priestly Medal Winners	13.3% 6.7%	13.3% 13.3%
ACS Women Presidents	13.0%	40.0%

The shining beacon of light in these very mundane numbers is the last line. ACS has shown a significant increase in the number of women elected to the office of president in the past 15 years. In fact – accomplished, competent women regularly appear as candidates for ACS local and national positions.

How does this segue into recruiting and retaining women into STEM disciplines? STEM concepts and materials are not likely to become easier, more exciting or "sexier". One of the most effective recruitment tools is strong, competent, admirable role models whose success can be emulated by the young. The ACS has succeeded in providing such role models to girls and young women in the field of chemistry. Maybe this will be the U. S. Presidential election cycle that creates of such a role model!

- Eileen DiMauro, Chair

## September Luncheon Meeting

Saturday, September 19, 2015

## A Special Invitation to High School Chemistry Teachers

#### Come and Learn How Involvement with the American Chemical Society Can Help You and Your Students

## **Old Spaghetti Factory**

1635 Industrial Park Ave. Redlands, CA 92374

Social and Check In: 11:30 am Luncheon: 12:00 pm Program: 12:45 pm

Program Overview: High school chemistry teachers play an invaluable role in conveying to their students both the beauty of chemistry and its impact on so much of their lives. This luncheon will provide an opportunity to recognize the contributions of these teachers. Teachers will also learn about the resources available from the American Chemical Society and specific opportunities for their students provided by the San Gorgonio Section. One of these is participation in the Local Chemistry Olympiad Examination with the possibility of receiving one of five Section college scholarships as well as earning the opportunity to take the National Examination. A second one is participation in Project SEED where the student is able to work on an 8-week summer research project, mentored by a university faculty member, and receive a \$2500 stipend.

#### Presenters:

Eileen DiMauro – Chair, Chemistry Olympiad Co-coordinator, San Gorgonio Section; Professor, Mt. San Antonio College Dennis Pederson – Chair Elect, Chemistry Olympiad Co-coordinator, Project SEED Coordinator, San Gorgonio Section; Professor, California State University, San Bernardino Project SEED participants Chemistry Olympiad Participants

#### Gifts and Door Prizes:

A copy of the Merck Index will be given to the first 30 high schools who register and attend. Drawings will also be held for several door prizes.

(Continued on Page 13)

INDEX TO ADVERTISERS	Research and Development Record Books
American Research & Testing9 Mass-Vac, Incifc Micron Inc9	Our most popular books are always in stock ready to ship \$16.50 each, FOB Chicago. Quantity discounts.
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## September Luncheon Meeting (Continued from Page 12)

#### Luncheon, Cost and Reservations:

For the entrée chose from Pasta with Marinara Sauce, Pasta with Sicilian Meatballs, or Baked Lasagna. Served with a Crisp Salad, Hot Fresh-Baked Bread, and Spumoni Ice Cream for Dessert. Drinks include hot tea, ice tea, coffee, milk, or soft drinks.

The cost will be \$12 for ACS members, \$15 for nonmembers, \$10 for retirees and \$5 for students. The luncheon is complimentary for high school chemistry Please make your reservation no later than 12 noon on teachers. 16<sup>th</sup> September by contacting either DiMauro Wednesday, Eileen (EDiMauro@MtSAC.edu) Dennis Pederson (909-537-5477. or dpedersn@csusb.edu).

**Directions:** From the west, take Interstate 10 to the Alabama exit in Redlands. Turn right (south) on Alabama, then right (west) on Industrial Park Ave. The restaurant will be on the left (0.1 mi.) From the east, take Interstate 10 to the Alabama exit in Redlands. Turn left (south) on Alabama, then right (west) on Industrial Park Ave. The restaurant will be on the left (0.1 mi.)

SOUTHERN CALIFORNIA SECTION AMERICAN CHEMICAL SOCIETY 14934 S. FIGUEROA STREET GARDENA, CA 90248

#### IMPORTANT Do Not Delay!

**Contains Dated Meeting Announcement** 

## PERIODICAL

## **Bi-Section Chemists' Calendar**

For more information on these events, please check our website at www.scalacs.org

#### September

- 1 College Lecture Series at CSULB featuring Krishna Kallury see page 3
- 18 SC Nominations Deadline for 2016 Election—see page 7
- 19 SC Luncheon honoring our 50/60 Year Members—see page 4
- 19 SG Luncheon for H. S. Teachers—see page 12

#### <u>October</u>

- 18-24 National Chemistry Week
- 30 Deadline for SC NCW Illustrated Poem Contest—see page 7

#### <u>November</u>

6-8 Western Regional Meeting at CSU San Marcos—see page 6