



May/June 2017

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

Southern California Section



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Southern California Section

Chair's Message



Inspiration.

We return from ACS national meetings exhausted, but also energized. In San Francisco, we had the opportunity to share successes, challenges, and new ideas with a



community that is constantly providing support and insightful feedback. Conversations with the most "seasoned" members of the Society offer advice and inspiration, reminding us that our ACS experience evolves through the "seasons" of our membership: from Student Member to Younger Chemist and eventually to Silver Circle. On a different scale, our involvement in ACS governance takes us along all sorts of paths, perhaps in directions that we never even considered. Regardless, there is never a lack of inspiration.

This year, we are inspired by Caroline Morgan the 2017 Paul Shin Memorial Chemistry Teacher of the Year, and Paul Weiss the recipient of the 2016 Tolman Award. Caroline has had an influence on many thousands of students through her dedication to student learning and their success. Paul has opened a new world for us through his discoveries of the ultimate limits of miniaturization by exploring the atomic-scale chemical, physical, optical, mechanical, and electronic properties of surfaces, interfaces, and supramolecular assemblies. Please join us in honoring Carolyn at the 2017 Educational Awards Banquet on May 19 at Mount Saint Mary's University and Paul at the Tolman Award Banquet on May 24 at UCLA. Visit SCALACS.org for more information.

Speaking of inspiration, we would like to thank Jerry Delker for his many years of providing inspiration and guidance to our high school students as they take the High School local section and National Olympiad each year. Jerry developed the current model of taking the test to the students—delivering the tests to over 30 schools each year. Jerry is retiring from coordinating the Olympiad this year, and we want you to know that we appreciate your service Jerry!

Would you like to provide inspiration to the next generation of STEM professionals? Join us as a judge for the Intel ISEF Science Fair happening in Los Angeles May 14-19th. Both of us have participated in these events in the past and we have come away being inspired (and somewhat humbled too). For more information about how to participate please contact Veronica Jaramillo at vijaramillo@pasadena.edu. *(Continued on Page 7)*

Educational Awards Banquet Friday, May 19, 2017

Mount Saint Mary's University Doheny Campus Donahue Center

10 Chester Place Los Angeles, CA 90007

Awards will be presented to the top-placing students in the local High School Chemistry Olympiad, to their teachers, to local ACS scholars and to

Caroline Morgan, Recipient of The 2017 Paul Shin Memorial High School Chemistry Teacher of the Year Award

6:00 p.m. Check-in 6:45 p.m. Dinner 7:30 p.m. Presentation of Awards

This year, we had more than 1,100 students representing over 40 high schools throughout Los Angeles County take the Local ACS Exam in March. Arcadia High School finished first overall while North Hollywood High School finished first for first year students. The winners of the local exam were invited to participate in the National Exam on April 22nd at Cal. State Dominguez Hills for a chance to be part of the International Olympiad in July in Nakhon Pathom, Thailand. These students, as well as the top performers and teachers from each school of 10 or more participants, will be honored at our annual Educational Awards Banquet, along with the Paul Shin Memorial High School Teacher of the Year, Caroline Morgan (see page 4 for her biography).

Reservations: We have a Mexican Buffet featuring chicken tacos and cheese enchiladas with all the fixings. The cost of the dinner is \$20 per person or \$15 for students, cash or check at the door. Please call Nancy Paradiso in the Section Office at 310 327-1216 or email office@scalacs.org by **Friday, April 28, 2017** for reservations.

Directions: The meeting will take place on the Doheny Campus in the Donahue Center in McIntyre Hall. For directions, please go to http://www.msmc.la.edu/about-msmc/our-campuses/driving-instructions.asp.

Congratulations to Caroline Morgan, MS, BSc (Hons) The Paul Shin Memorial High School Chemistry Teacher of the Year

Caroline Morgan is a Chemistry teacher at Francisco Bravo Medical Magnet High School. She has taught at two other LAUSD schools: Fulton Junior High School and James Monroe Law and Government High School.

Ms. Morgan was born in Great Britain, but moved to Hong Kong at the age of 5 when her father took up a civil service posting with the Hong Kong Government. She attended elementary and high school in Hong Kong, eventually returning to England to attend University. Her Bachelor of Science (Hons) degree in Chemistry is from the University of Bristol, where her research field was Organic Geochemistry.

Ms. Morgan began her teaching career in London. After 8 years at Chiswick School, Caroline accepted an offer from Carshalton High School for Boys, and transferred to become Deputy Head of Science. In 1982 she became affiliated with Chelsea College, this time as a mentor teacher for the Science teaching program. She supervised and mentored at least one student per year for the next 7 years.

In 1988 she applied to the US Information Agency Fulbright Fellowship program for a position as an exchange teacher. This resulted in a one year posting to Los Angeles.

After returning to London, fulfilling her contract with Carshalton High School, and waiting on seemingly endless immigration paperwork, she eventually returned to LAUSD, and Fulton Junior High School, with a permanent contract. After two years, she transferred to James Monroe Law and Government Magnet High school to teach AP Chemistry, Chemistry and Honors Physics.

When the opportunity arose in 2015, she applied for a transfer to Bravo Medical Magnet High School. This has led to a number of new experiences: real collaboration with fellow Chemistry teachers, launching the new AP Physics 1 class, and most fun (and time consuming) of all, helping to coach the myriad of Science teams that work out of the 5th floor at Bravo.

She has also presented at a number of conferences notably, for the last 5 years, at the American Chemical Society (Southern California) High School Chemistry Teachers Conference at Occidental College.

Reminder! Tolman Award Dinner Meeting

Wednesday, May 24, 2017

UCLA Faculty Center Main Dining Room

480 Charles E. Young Drive, East Los Angeles, CA 90095

"Exploring the Ultimate Limits of Miniaturization"

Paul S. Weiss Department of Chemistry and Biochemistry, UCLA

6:00 p.m. Check-in and Hosted Social Hour 7:00 p.m. Dinner 8:00 p.m. Presentation

The Award: The Richard C. Tolman Medal is awarded each year by the Southern California Section of the American Chemical Society in recognition of outstanding contributions to chemistry in Southern California. The Tolman Medal recognizes broad accomplishments in chemistry rather than a single fundamental discovery. These contributions may be of several kinds, including seminal research of widely regarded influence, achievements of broad impact in chemical technology, significant contributions to chemical education, and outstanding leadership in science on a national level. To be eligible for the Medal, the recipient must have accomplished a major portion of his or her work while a resident of Southern California.

We use molecular design, tailored syntheses, intermolecular Abstract: interactions, and selective chemistry to explore the ultimate limits of miniaturization. We direct molecules into desired positions to create nanostructures, to connect functional molecules to the outside world, and to serve as test structures for measuring single or bundled molecules. Interactions within and between molecules can be designed, directed, measured, understood, and exploited at unprecedented scales. Such interactions can be used to form precise molecular assemblies, nanostructures, and patterns, and to control and to stabilize function. We selectively test hypothesized mechanisms of function by varying molecular design, chemical environment, and measurement conditions to enable or to disable function and control using predictive and testable means. Critical to understanding these variations has been developing the means to make tens to hundreds of thousands of independent single-molecule/assembly measurements in order to develop sufficiently significant statistical distributions, while retaining the intrinsic heterogeneity in the measured function of the molecules and (Continued on Page 6)

Southern California Section

Tolman Award Dinner Abstract (Continued from Page 5)

assemblies. We have likewise developed and applied the means to map buried chemical functionality and interactions. The next steps are to apply these ideas to biomolecular assemblies and larger biological systems to understand the variations in structure and function that have been inaccessible to study.

Cost: There is a choice of dinner entrees of Marinated Grilled Rib-Eye Steak w/ herbed polenta, veal demi glaze, and vegetables (\$40) or Portobello Mushroom Ravioli w/ Swiss chard, porcini cream sauce and truffle oil drizzle (\$40). Both options include a hosted social hour, salad, dessert, wine with dinner and tax and tip, payable at the door with cash or check. **Please RSVP to Nancy in the Section Office at office@scalacs.org by Friday, May 5, 2017**.

Directions: For directions to the campus, use this link: <u>http://maps.ucla.edu/campus/?locid=83901</u>. Parking is \$12 for guest parking in Parking Lot 2 (just south of the Faculty Center).

Congratulations to Our Local Section Student Chapters

The following Student Chapters received awards at the ACS National Meeting in San Francisco:

Outstanding Student Chapter

Pasadena City College

Commendable Student Chapter

East Los Angeles College Mount Saint Mary's University Santa Monica College University of California, Los Angeles

Honorable Mention

California State University, Long Beach Los Angeles Trade Technical College

Green Chapter Awards

Pasadena City College University of California, Los Angeles

Congratulations to our National Award Recipients

We would like to congratulate our local section members who received National Awards at the ACS National Meeting in San Francisco in April. The following awards were presented:

Elias J. Corey Award for Outstanding Original Contribution in Organic Synthesis by a Young Investigator: Neil K. Garg, University of California, Los Angeles

George A. Olah Award in Hydrocarbon or Petroleum Chemistry

Robert Howard Grubbs, California Institute of Technology

Gabor A. Somorjai Award for Creative Research in Catalysis John E. Bercaw, California Institute of Technology

Chair's Message (Continued from Page 2)

Caroline, Paul, our fellow local section members, and our amazing students, live the ACS vision of **improving people's lives through the transforming power of chemistry.** Regardless of the season of your ACS membership, there is always an opportunity to be involved. During the long summer break, please consider the next ACS challenge you will tackle and we hope you return refreshed and inspired to share your talents and interests. We will be better people and a better Society because of your contribution.

Happy trails,

- Armando Rivera, Chair
- Bob de Groot, Chair Elect



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

Among the eminent women scientists of the twentieth century Kathleen Yardley Lonsdale ranks highly. She was not a Nobel laureate (so few women were!) but she became one of the first two women to be elected a Fellow of the Royal Society, the first woman President of the International Union of Crystallography, the first female tenured Professor at University College, London, and the first female President of the British Association for the Advancement of Science.

Kathleen Yardley was born in Ireland in 1903; her English father was at that time a postmaster at a town near Dublin. Her parents separated and her mother took her five children to live in England. Kathleen was a child during World War I and saw Zeppelins bomb her suburb. She dates her anti-war feelings to this event.

An excellent student Kathleen entered Bedford College, a women's college and part of the University of London, at 16, changed her major from mathematics to physics, and graduated at 19 with the highest grade in her finals of the last ten years. She earned a Master's degree with William Henry Bragg, Nobel Laureate for his crystallographic work, and moved with Bragg to the Royal Institution in 1923. By then she had met Thomas Lonsdale, a fellow physics student. At the Royal Institution Kathleen earned a D.Sc. rather than a Ph.D. (an unusual distinction) for crystallographic work on ethane derivatives. She married Thomas Lonsdale in 1927, and the couple settled in Leeds where Thomas worked towards his Ph.D. and Kathleen was awarded a prestigious scholarship and a grant from the Royal Society for a spectroscope and an ionization spectrometer. She solved the crystal structure of hexamethyl benzene, showing for the first time by physical methods the planar structure of the benzene ring and the equality of bond lengths within the benzene ring. Christopher Ingold, the physical organic chemist, read Lonsdale's paper and wrote to her: "the calculations must have been dreadful, but one paper like this brings more certainty into organic chemistry than generations of activity by us professionals." Another scientist influenced by this early work of Lonsdale's was Dorothy Hodgkin, who said later that as a young graduate student the clear exposition by Lonsdale of how to go about analyzing X-ray data was influential on her own work - which later led to the award of a Nobel Prize to Hodgkin.

After her husband earned his Ph.D. at Leeds his new position was in London and Kathleen accompanied him. Working again at the Royal Institution she had no X-ray equipment available, and so embarked on measuring magnetic susceptibilities of aromatic compounds. The results *(Continued on Page 9)*

This Month in Chemical History (Continued from Page 9)

suggested the existence of pi-orbitals in these compounds extending over the whole molecule. When she returned to X-ray work in the late 30s she improved on the Fourier analyses that she had pioneered, and developed new ideas on space groups. She worked on diamonds, on calculi like kidney and gall stones, and on solid state transformations.

Lonsdale was a noteworthy pacifist. Perhaps influenced by her childhood experience in World War I she and her husband became Quakers in 1935. During World War II she refused on principle to become a "fire-watcher", that is a person in Civil Defense who reported on the positions of incendiary bombs dropped on London. She was fined for this refusal, but refused to pay the small amount of the fine! Consequently she served a one month term in the Holloway Prison for Women. This experience led her to become a prison reformer and she later served on the Boards of overseers of a number of prisons. In the 50s she visited the USSR with a group of Friends (Quakers) on a peace mission, and in the 50s, along with Pauling, she campaigned vigorously against the testing of nuclear weapons. In 1957 her book "Is Peace Possible" was published as a Penguin paperback.

Lonsdale became a professor at University College in 1949; she had 3 children and in 1956 became a grandmother – and was named a Dame of the British Empire. She published dozens of papers, mostly on X-ray crystallography. She was awarded honorary degrees by many British universities. But in late 1970 she was diagnosed with leukemia. She died in 1971 aged 68.

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

KOrso@irell.com

"Prior art" is the publicly-accessible information against which the subject matter of a patent claim is compared in order to determine whether that subject matter is patentable. Congress recently adopted a new definition of "prior art." Previous editions of this column have addressed when the new definition applies. This edition begins unpacking the definition itself.

The new definition of prior art comprises a general rule, broken into two subparts, plus a group of exceptions. The first subpart of the general rule states: "A person shall be entitled to a patent unless—(1) the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention." As discussed in past editions of this column, the effective filing date of the claimed of the claimed invention is essentially the filing date of the patent application in which the claim appears, or, if that application properly claims priority to one or more earlier patent applications, the earliest of those applications in which the claimed invention is described.

The first subpart of the general rule defines prior art according to when it became public. Several categories are listed. The first category is directed to patents, domestic and foreign, that claim the invention at issue. These patents constitute prior art under this subpart as of the date they were granted (there is an obscure exception relating to patents kept secret by a government).

The second category is "printed publications," which are generally documents that have been disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter of the art, exercising reasonable diligence, can locate them. This generally includes foreign and domestic documents that have been made publicly available, such as journal articles, books, user manuals, specification sheets, etc. Foreign and domestic patents that disclose—but do not claim—the invention at issue, and foreign and domestic published patent applications, can be "printed publications."

Notwithstanding the reference to "printed" in the title of this category, "printed publications" are not limited to printed media. For example, an on-line database, Internet publication, microfilm, or compact disc can be a "printed publication" even though the relevant information exists only in electronic form, provided it was accessible to persons concerned with the art to which the document relates. The next edition of this column will address some perhaps counterintuitive examples of printed publications.

* 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



This year as we head into summer I am thinking of a song first recorded by Nat King Cole in 1963, "Those Lazy-Hazy -Crazy Days of Summer". Although I'm now completely retired from teaching I still remember having that summer break to do some catching up on postponed activities. Not really "lazy", just different. As far as "hazy" is concerned,

Chair's Message

summer in Southern California does have some of that. However, the haziness is very much reduced from what I encountered after my arrival in 1970 and way less than what I observed during a trip to China three years ago. For this we owe thanks to the many chemists who helped us understand smog formation and made discoveries that aided in the decreased levels.

As the year winds down for high school students some of the top chemistry students will be receiving recognition for their performance on the Local Section Chemistry Olympiad Examination. In the San Gorgonio Section again this year about 300 students participated and on April 22 ten of them sat the 2017 National Examination. This year's nominees for the National Examination are:

Ayala High School	Alex Chen*
Diamond Bar High School	Brian Chang* Jasmine Yang*
Etiwanda High School	Brant Lee Erl Lee
Great Oak High School	Tim Bondoc*
Riverside STEM Academy	Nivedita Kanrar*
Walnut High School	Emily Ruan* Matthew Nguyen*
Wilson High School	Joshua Leung

The San Gorgonio Local Section Examination is also used to select students to receive the annual Section scholarships. The students whose names are marked with an asterisk are the 2017 *(Continued on Page 13)*

San Gorgonio Section

May 2017 Dinner Meeting

Student Scholarship and Awards Recognition Banquet

Friday, May 12, 2017

Mandarin Garden 1445 University Avenue Riverside, 92507 Phone: 951-786-9887

Social and Check-in: 5:45 PM Dinner: 6:30 PM Awards/Recognition Program: 7:15 PM

In March, high school students in the San Gorgonio Section region took an exam to qualify for the National Chemistry Olympiad. Our section also uses this exam to choose the recipients of section-sponsored college scholarships. Please join us in honoring these truly remarkable students and their teachers at this meeting. As those of us who teach chemistry know, chemistry plays a fundamental role in our understanding of many other areas including medicine, the environment, food science, cosmetics, and more. For this reason chemistry has earned the label "The Central Science". Through a number of short presentations we will have the opportunity this evening to explore one of these areas, pharmaceuticals. Presenters will be from the pharmaceutical industry, the nutraceutical industry, and academic pharmacy. Their stories will illustrate some of the many career paths open to those who find chemistry exciting.

Dinner, Cost, and Reservations: The Chinese dinner will feature six entrees, fried and steamed rice, and hot tea, iced tea or soda. The cost will be \$15 for ACS Members, \$20 for non-members, \$10 for seniors & retirees, and \$8 for students. (Cash or check at the door.) No charge for student honorees and their teachers. Please make your reservations **no later than Tuesday May 9th noon** by contacting Dennis Pederson, chair, dpedersn@csusb.edu, phone 909-886-2196 or David Srulevitch, secretary srulev@charter.net, phone 909-594-3070. Include names and number of persons. Please be certain to honor your reservations.

Directions: Traveling East or West on Hwy 60, exit on University Avenue, turn right. The restaurant will be on the right after about one-half mile.

Attention Chemistry Professors: Please bring any extra science or chemistry textbooks that you may have to this SGS Dinner Meeting so that we may donate them to the students and high school libraries.

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Chair's Message (Continued from Page 11)

scholarship winners. These ten students together with the top performing student from each of the other participating schools and the chemistry teacher from each school will be honored at our annual High School Recognition Dinner on Friday, May 12. Details regarding the dinner are provided elsewhere in this SCALACS issue.

I wish to acknowledge and express my thanks to Eileen DiMauro and David Srulevitch who made it possible to hold this successful event. Special thanks also to the Chemistry Department at the University of California Riverside for providing the site for the National Examination and to Dr. Kerry Hanson for arranging the specific details. And last, but certainly not least, my sincere gratitude and admiration to the dedicated high school teachers who took the time to coordinate the participation of their students in the 2017 Chemistry Olympiad Examination. Now on to the lazy, hazy, crazy days and perhaps as the last line from the song says, "You'll wish that summer could always be here".

Dennis Pederson, Chair

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

<u>May</u>

- 12 SG Student Scholarship and Awards Recognition Banquet—see page 12
- 14-19 Intel Science Fair—see SC Chair's Message
- 19 SC Educational Awards Banquet—see page 3
- 24 SC Tolman Award Dinner honoring Prof. Paul Weiss at UCLA see page 5

Have a great Summer!