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SCALACS

March 2019

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

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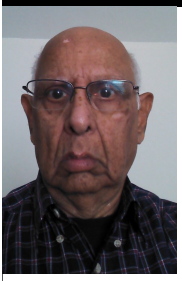

Chair's Message

Greetings to all SCALACS members. We have an ambitious schedule for 2019 as I indicated in my previous month's message. We have planned the following for the first half of the year:

- Seminar on SIFT-MS and applications by Syft Technologies of Christchurch, New Zealand, on February 22nd, at CSULB
- Seminar by Dr. Tamitha Skov of Aerospace Corporation of Los Angeles on March 16th, at CSU Northridge
- Expanding your Horizons program organized with SCALACS by Eleanor Siebert at Mount Saint Mary's University Chalon Campus on March 9th, catering to Middle School Girls and encouraging them to pursue Math and Science
- Seminar in April by Prof. Nien-Hui Ge of University of California, Irvine (date to be announced)
- Visit to California Science Center, Space Shuttle Endeavour Exhibit, along with a presentation by Dr. Arthur Hill (Date to be announced)

As this year happens to be the 150th anniversary of the creation of the periodic table, we are planning to organize an event for the benefit of high school and college students and their teachers. We are working on the format for this as well.

We are proposing to introduce a Science Awareness program for High School level girl students and are working on the format and details. We plan to conduct this event in the second half of the year.

We are planning to continue Chemists Celebrate Earth Week, the National Chemistry Week, Chemistry Teachers Meeting and ACS International Activities events this year with the cooperation of the School Districts, Community Colleges and Universities in the region.

- Krishna Kallury (Chair)
[kkallury@socal.rr.com]

SEMINAR NOTICE
(Jointly Sponsored by SCALACS & LAUSD)

Saturday, March 16, 2019
Time: 11:00 am to 12:00 noon

Space Weather and How it Affects Our Modern World
Speaker: Dr. Tamitha Skov

Cal State Univ. Northridge,
Education Building, Room 2103
18111 Nordhoff Street, Northridge, CA 91330

Abstract: Similar to terrestrial weather, "Space Weather" causes a wide variety of issues that affect our daily lives. From the disruption of satellite GPS signals to the beautiful light displays of the aurora, this talk gives an overview of Space Weather and the multi-faceted impact it has on life on Earth. We begin with the origin of Space Weather at the Sun and follow solar phenomena as they travel through space to reach Earth. We discuss the many ways these phenomena affect Earth, including the kinds of services and people impacted by various types of "solar storms," and demonstrate how space science, meteorology, and public use of Space Weather forecasting intersects in a real-world example. The recent confluence of extreme terrestrial weather and extreme Space Weather events during the hurricanes of September 2017 defines a new kind of a "perfect storm" in our modern world. Examples like these illustrate why Space Weather is becoming such a critical component of modern weather and highlight why we need to revolutionize public perception and consumption of Space Weather science.

Biography: Dr. Tamitha Mulligan Skov holds B.S. degrees in physics and physical chemistry, as well as M.S. and Ph.D. degrees in geophysics and planetary physics from the University of California at Los Angeles (UCLA). In 2004 she joined The Aerospace Corporation in Los Angeles where she is currently a Research Scientist in the Physical Sciences Laboratory. Dr. Skov works primarily in the fields of solar and space physics research and in the testing of spacecraft materials in realistic space radiation environments. She is an instructor at The Aerospace Institute and has served as an audio forensics analyst and instructor for the National Law
(Continued on Page 4)

Dr. Tamitha Skov Biography (Continued from Page 3)

Enforcement and Corrections Technology Center (NLECTC), funded by the Department of Justice. Her forecasting work as the "Space Weather Woman" is widely known on social media such as You Tube, Twitter, and Facebook. Dr. Skov has been featured in Popular Science Magazine and on television shows for The Weather Channel and The History Channel. She makes regular appearances on TMRO.TV for Space News and TwiT TV for Ham Nation, doing space weather forecasts under her callsign WX6SWW.

Directions: For a campus map and directions, please go to: https://www.csun.edu/csun-maps.

RSVP: The lecture is free, but we'd like to be able to let the facility know how many people will be attending. Please RSVP to Nancy in the Section Office at office@scalacs.org by **Thursday, March 14, 2019**.

2019 Expanding Your Horizons Los Angeles
Saturday, March 9, 2019
Mount Saint Mary's University
Registration is Open Now!

Expanding Your Horizons (EYH), a career day generously supported by the Southern California Section, informs girls in grades 5-8 about careers in math- and science-related fields. Girls participate in hands-on workshops such as dissecting pig hearts, isolating DNA, and making colors with chemistry. There are also workshops for parents, teachers and counselors about making math and science a career option for girls. If you are a woman interested in leading a hands-on workshop for girls, volunteering to help, or have questions, please contact Eleanor Siebert (esiebert@msmu.edu).

Registration for the conference is open now. All girls in grades 5-8 and their parents are invited to participate. There is a $20 fee for each participant to cover lunch and materials. Note that only paid registered participants may attend the conference. Please register online; there is no on-site registration: www.expandingyourhorizonsla.org.

Undergraduate Research Conference
Saturday, April 13, 2019

Mount Saint Mary's University, Chalon Campus
12001 Chalon Road
Los Angeles, CA 90049

The 2019 Undergraduate Research Conference in Chemistry and Biochemistry will be held at the **Mount Saint Mary's University, Chalon Campus on Saturday, April 13, 2019**. **The deadline for abstracts is Friday, March 15, 2019.** For more information, please contact Katherine Liu at kliu@msmu.edu or Dr. Eric Stemp at estemp@msmu.edu.

High School Olympiad

The Southern California Section will hold the High School Chemistry Olympiad on **March 20th and 21st, 2019** at over 35 schools in the Los Angeles area. The test is designed to test a student's knowledge of a wide variety of topics in chemistry. If you know of a school or student that would like to participate, please direct them to our website, www.scalacs.org/?page_id=236 to download the letter and participation form. We now offer the option to pay with a credit card online at our website. The top scorers on the local exam are nominated to compete in the National Exam which will take place on **April 27th, 2019 at California State University Dominguez Hills**. The top 20 national winners are invited to attend an all expense paid two-week study camp at the U. S. Air Force Academy in Colorado Springs, Colorado. The top four finalists are then selected to represent the United States at the International Chemistry Olympiad which will be held in Paris, France, July 21-30, 2019.

We will recognize the top local students at our Educational Awards Banquet to be held on **May 17th, 2019** with monetary awards and certificates. The Banquet will take place at the Mount Saint Mary's University Doheny campus. For more information, please contact Dr. Jerry Delker at delker@earthlink.net or Nancy Paradiso in the Section Office at office@scalacs.org.

This Month in Chemical History

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

I have in past years devoted an early column of the year to a look at the significant work in the chemistry of 100 years ago as reflected in the "Annual Reports of the Progress of Chemistry" of the Chemical Society of London. So this month's column will begin an examination of the contents of Volume XVI for 1919 (published in 1920). It is a relatively slim volume for obvious reasons. From the opening of the first section on General and Physical Chemistry: "this Report synchronises with the return of many scientific workers from occupations connected more or less directly with the conduct of war, to conditions of life which may be expected to provide the opportunity for as resumption of scientific investigation for its own sake….the period under review may be justly described as a lean year." And further, and significantly: "physical chemistry during the next decade is likely to be very largely influenced by the intrusion of those ideas which are, more or less intimately, associated with the quantum hypothesis." Prophetic words, indeed.

Questions about atomic structure loom large at that time, and were addressed in three major lectures by F. Soddy, J.C. Nicholson, and J.H. Jeans. Soddy was the colleague of Rutherford, discoverer of isotopes, and a pioneer researcher in radioactivity. Nicholson was a well-known spectroscopist. Jeans was an astrophysicist whose popular books on science had a wide following. Nicholson used the "observation" of an infinite (!) number of lines in the emission spectra of the structurally simplest elements (hydrogen ?) to argue against the theories of Rutherford and Bohr. Adding additional weight to his arguments is a paper by Sir J. J. Thomson that also rejects the Bohr hypothesis that the angular momentum of the electron is quantized. Thomson continues to model more complex atoms than hydrogen as containing alternate shells of attractive and repulsive forces with intervening positions in which the electrons are in (static?) equilibrium. On the other hand Soddy and Jeans enthusiastically embrace the Rutherford and Bohr models. We can smugly assert that we know who wins those arguments, but, to use the jargon of science historians, that is a Whiggish approach to history.

A section is devoted to the question of atomic disintegration by collision with alpha particles. Rutherford has demonstrated that when nitrogen atoms are impacted by high energy alpha particles hydrogen atoms (protons) are ejected (and presumably, though this is not made clear, carbon nuclei are also formed). The yield in such collisions is extremely small, of the order of one in 100,000.

The influence of Alfred Werner's recent contributions to coordination chemistry is evident in a section on valence. The author R. De has examined the compound chloropentammine-cobaltic chloride and deduces that of the three valence

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electrons of the cobalt(III) atom "one… is bound to the chlorine atom contained within the complex while the other two, situated outside the complex, are free and correspond with valencies of the polar type." This seems to me an obvious re-statement, in somewhat complicated terms, of Werner's views.

A section on chemical change and radiant energy considers Perrin's theory that many phenomena observed in both physical and chemical transformations can be explained by assuming that they are determined by the emission or absorption of radiant energy. This comprehensive review covers fluorescence, phosphorescence, radioactive disintegration, and chemical change (!). The reviewer laments that the distinguished proponent of such ideas has simply failed to note much preceding work on this subject. In particular the contributions of Lewis and Einstein have been ignored. Perrin seems to have been fixated on what he considers as obscurities in the origins of quanta as first described by Planck.

To continue with more conventional chemistry a detailed investigation of the photo-induced reaction between hydrogen and chlorine has been undertaken by Chapman building on earlier work by Bodenstein. The significance of the role of trace amounts of foreign substances, particularly oxygen, has been established. The reaction is first order in each of the intensity of light absorbed, the concentration of hydrogen, and the concentration of chlorine, and inversely as the concentration of the oxygen retarder. Light is absorbed by the chlorine molecules which are thus activated and react with hydrogen molecules. Oxygen can deactivate the activated chlorine molecules. This mechanism agrees well with the observations of Chapman et al.

Langmuir has proposed a model for the action of heterogeneous catalysts. He postulates that the surface of a solid catalyst becomes coated with a monolayer of one or other of the reactants in the surrounding gaseous or liquid medium. This adsorption may change the chemical nature of the adsorbed species; for example a molecule like hydrogen may become dissociated into its constituent atoms that then become the reactive species. Langmuir has presented experimental evidence that supports this novel theory. These ideas of Langmuir's remain the basis of some current theories of heterogeneous catalysis.

I will continue my exploration of aspects of the chemistry of 1919 in a future column.

Insights Into IP Law

Keith Orso*, Irell & Manella LLP
KOrso@irell.com

Inventors who allow unrestricted and uncontrolled uses of their inventions before filing patent applications can be denied patents, or have their patents invalidated, on theories of prior "public use" under the Patent Statute. To be a prior "public use," a use must be sufficient to place the invention in the public's possession. The previous installment of this column discussed a recent case that addressed whether a patent to a drug formulation was invalid based on an earlier clinical trial using a formulation developed and tested by someone other than the inventor.

The clinical trial was subject to certain confidentiality obligations, but the trial court determined that the trial nevertheless put the invention into the possession of the public. It noted that the participants in the clinical trial were under no obligation of confidentiality and were invited to discuss the trial with their regular doctors.

The Court of Appeal disagreed that this rendered the prior use "public," within the meaning of the Patent Statute. It found that the absence of any formal obligation of secrecy for study participants was not determinative, noting that it had never required a formal confidentiality agreement to show non-public use. It explained that in the absence of such an agreement, the question was simply whether there existed circumstances creating a similar expectation of secrecy.

In the case at bar, there was evidence that the investigators for the clinical trial were the most knowledgeable people involved in the study, and that they were required to sign a pledge of confidentiality. The Court of Appeal noted that it was far from unique that the subjects of the study did not sign such a pledge. In fact, the court observed that clinical-trial subjects typically do not sign a confidentiality agreement, as patients must be free to at least provide information to their other healthcare providers and their family members. In any event, the study subjects were given incomplete descriptions of the treatment formulation—namely, the identity of the active chemical compound and range of possible dosages being investigated, but not the composition of the formulation itself. Because the study subjects were themselves unaware of the composition, they were never in a position to reveal the composition to anyone else.

The Court of Appeal concluded that a judge or jury could conclude that the clinical trial was conducted with a reasonable expectation of confidentiality as to the nature of the formulations being tested and reversed the trial court's finding of a prior "public use."

* The author earned engineering and chemical engineering undergraduate 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.

Chair's Message

Celebrating the Old and the New

I would like highlight some old and the new milestones in the San Gorgonio Section. Let's begin with the "new." The Section is continuing to focus on the newer members in our section with events that highlight career opportunities for chemists. (Please see our March meeting announcement). We are pleased to welcome California Baptist University as the newest campus to host a meeting. The beautiful 160-acre campus is located in Riverside and was founded in 1950. Fall 2018 enrollment totals 10,486 students. CBU offers degrees at the associate, bachelor's, master's and doctoral levels, including B.S. degrees in chemistry and chemical engineering. Concentration areas in chemistry include advance studies in chemistry, environmental science, secondary chemistry education, and pre-medical chemistry. Many thanks to the Chemistry Department at CBU for volunteering to accommodate this event on their campus and for providing lunch for the attendees.

Now for the "old"; this year marks the 70th anniversary of the founding of the San Gorgonio Section. Dr. Francis Gunther, a professor at the California Citrus Experiment Station, was the driving force in establishing the Section. The goal was to provide opportunities to attend meetings closer to home that were free from Los Angeles traffic headaches. The California Citrus Experiment Station, where the inaugural meeting of the Section was held in April 1949, was the precursor to U.C. Riverside. In 1974, the Section began offering scholarships to the highest scoring students in the U.S. National Chemistry Olympiad, an activity that continues to this day. We are currently in the planning stages for a 70th anniversary celebration later in the year.

On a more solemn note, the Section is sad to acknowledge the passing of our oldest member, Dr. Frank Lambert at the age of 100. He was a member of ACS for 76 years, joining the organization in 1942. He lived in the San Gorgonio Section during his later years but most of his professional experience was in the Southern California Section. His smiling face and updates on the finer points of entropy will be missed.

Ernie Simpson, Chair

Careers for Chemists
(Alternatives to an Advanced Degree)

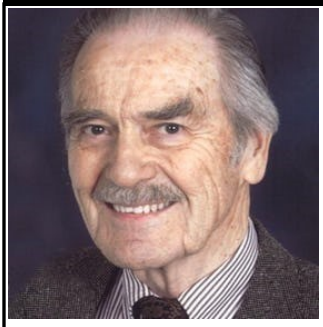
Saturday, March 9, 2019
9:30 am

California Baptist University
Business Building 202
8432 Magnolia Avenue
Riverside, CA 92504

The San Gorgonio Section is pleased to continue its exploration of "Careers for Chemists." People who major in chemistry are aware of the pathway from a B.S./B.A. to a graduate degree or a health care profession via pharmacy, dental or medical school. Exciting opportunities also exist for those who do not wish to pursue an advanced degree. Speakers will share career opportunities and experiences available to those with Bachelor's degree. Following their presentations, speakers will participate in a workshop where they will be available for questions and mentoring. Lunch will be served in the award-winning campus cafeteria after the program. Campus tours will be available during this time. After lunch, remain on campus to cheer on the Cal Baptist Women's basketball team as they take on New Mexico State.

9:30	Check-in and social
10:00	Welcome – Dr. Ernie Simpson
	What's happening on campus – Dr. Tom Ferko
10:30	Career speakers
11:15	Workshop and mentoring with speakers
12:00	Lunch and campus tours
1:00	Basketball game – CBU vs NM State

Lunch, Cost and Reservations: There is no cost for students to attend this meeting, but due to limited seating, a reservation is required. Lunch will be provided by the CBU Chemistry Department. The cost for ACS nonstudent members and nonmembers is $10. **Please make your reservation no later than Sunday, March 3 by contacting David Srulevitch (srulev@charter.net or 909 455-6135).** Parking is free. *Continued on Page 13)*



In Memoriam
Dr. Frank Lambert

Dr. Frank Lambert was born July 10, 1918 in Minneapolis, Minnesota. He was fortunate to be awarded a scholarship to Harvard in the competition initiated by President James Bryant Conant "to increase the geographical diversity of Harvard undergraduates" in 1935. Thinking that he could shorten his grad school work by taking a graduate level thermodynamic course, he was admitted to the class as a senior. Its difficulty resulted in a B and sealed his decision to become an organic chemist rather than a physical chemist. He graduated with honors in 1939. Dr. Lambert pursued graduate work at the University of Chicago under the direction of Dr. Morris S. Kharasch and received his Ph. D. in 1942 with a dissertation on the effect of metallic halides on Grignard reactions.

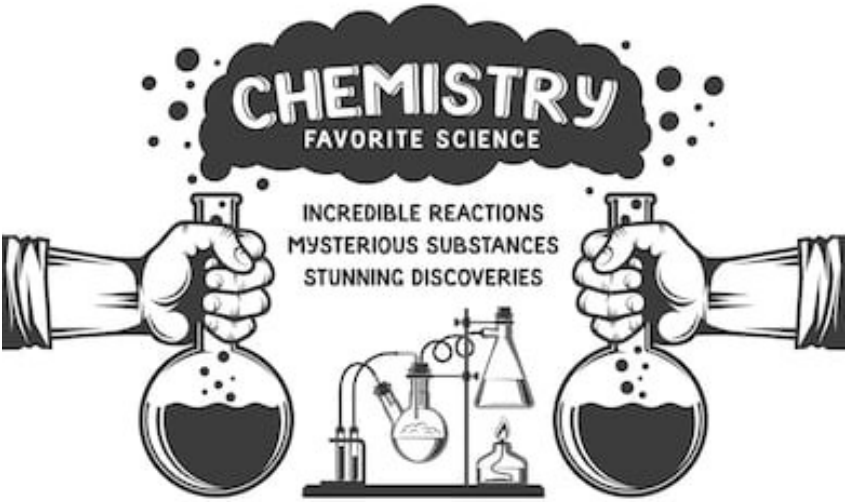
After serving in the US Army in WWII and working briefly in industrial research and development, Dr. Lambert joined the faculty of Occidental College in 1948. His primary concern was teaching. He advocated the abandonment of the standard lecture. Students were given his outline of the major points in the textbook for the class meetings of the next week. The classes consisted primarily of back and forth dialog between the students and Dr. Lambert, emphasizing only the hard or 'tricky' portions of the assigned text. He called it the "Gutenberg Method". "Why should the instructor present a boardful of elegantly organized material with answers by the score to questions that the students have not asked?" Dr. Lambert was the first scientist at Occidental to be a Faculty Award Lecturer, the faculty's highest award at that time for teaching. In 1968, he became the first recipient of the Loftsgordon Award, a student honor for outstanding teaching. Additionally, his research in the synthesis and polarography of organic halogen compounds was designed for undergraduate collaboration and all but one of his articles were published with student co-authors.

After his retirement from Occidental College in 1981, Dr. Lambert joined the staff of the J. Paul Getty Museum as the first permanent scientific advisor to the Museum, working primarily with the Antiquities Conservation Department. He initiated videotaping at the Getty, *(Continued on Page 12)*

Dr. Frank Lambert (Continued from Page 11)

demonstrating its utility for exact recording of new acquisitions when they were received. He became the principal aide to the Scientific Research Director of the new Getty Conservation Institute in 1983. He continued research on problems of maintaining low-oxygen atmospheres in sealed display cases, and aided in the writing of three books until 2002.

Two decades after that his retirement from Occidental College, at the end of his Getty career, Dr. Lambert began to think about the serious problem of defining a scientific concept, entropy, by such a non-scientific measure as “disorder” or "mixedup-ness". After his initial 1999 article, "Shuffled Cards, Messy Desks, and Disorderly Dorm Rooms – Examples of Entropy Increase? Nonsense!", a second article completed his critique of the inadequacy of describing entropy in terms of "disorder". His work has influenced the way in which entropy is presented in introductory textbooks and in popular science writing. Within the last decade, the majority of first-year chemistry texts and two in physical chemistry have discarded the previous conceptual definition, "entropy is disorder", and adopted Lambert's view, introducing a quantitative evaluation, "entropy is a measure of the dispersal of energy in space and phase space."



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Lunch, Cost and Reservations (Continued): Please honor your reservation. Tickets to the basketball game are free, but we would like to get an idea of how many we need. Please indicate if you would like a ticket to the game when you make your reservation.

Directions: California Baptist University is located off the 91 freeway. The main campus entrance is at the intersection of Campus Bridge Drive and Magnolia Avenue. When you enter campus please stop at the welcome booth and let them know you are here for the ACS Meeting. The Business Building is the 2nd building on the left hand side as you drive south on Campus Bridge Drive. Park in the large lots on the right-hand side of Campus Bridge Drive. Parking is free and no pass is needed. Our meeting is in Business Building 202. For directions, please see the campus map at https://calbaptist.edu/about/map-directions.

Directions from CA HIGHWAY 91 EAST, Exit at Adams Street and turn left. Proceed to Magnolia Avenue and turn left. Proceed to Campus Bridge Drive and turn left at traffic light into campus. From Orange county, take CA HIGHWAY 91 East. From Los Angeles, take I-10 east or highway 60 east to I-15 south to CA HIGHWAY 91 East. From San Diego County, Take I-15 north to CA HIGHWAY 91 East.

Directions from CA HIGHWAY 91 WEST, Exit at Adams Street and turn right. Proceed to Magnolia Avenue and turn left. Proceed to Campus Bridge Drive and turn left at traffic light into campus. To CA HIGHWAY 91 West: From Palm Springs, take I-10 west to I-215 S/Hwy. 91 W (Beach Cities).

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

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