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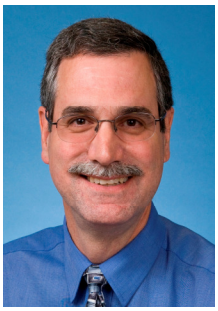
# SCALACS

January/February 2015

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



## January and February Section Meetings

**"An Inside Look into a Sports Drug Testing Laboratory"**
**Dr. Anthony Butch, UCLA**
**January 14, 2015**
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**Dr. Ernie Simpson**
**"The Chemistry of Wine"**
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**3:00 –5:00 pm**
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# Southern California Section

## Chair's Message

Happy New Year! I hope that you had an amazing holiday season.

I have been contemplating what to write about in my first Chair's message. I feel not only reflective about all the wonderful events our section carried out last year, but also I am hopeful that during this next year our planning will lead to successful activities and events. I thought I would highlight some of the events that took place last year: A tour of the Los Angeles Hyperion treatment plant, interesting and revolutionary dinner meeting speakers, including Dr. Frances Arnold from Caltech and Dr. Mark Thompson from the USC, the first SCALACS Chemistry Bowl for chemistry clubs, a Women's Chemists night out, a YCC ice cream social, and a joint dinner meeting with Dr. Bob Eganhouse from the US Geological Survey.

Members of our section were involved in organizing outreach activities for National Chemistry Week and Earth Day at the Science Center and volunteered at the Expanding Your Horizons Conference and at local Science Fairs. We also celebrated the success of our members, including: The Tolman Award recipient, Dr. Mark Thompson; the High school teacher of year, Dr. Debbie Bennet; our 50/60 year members; and the Outreach Volunteer of the Year, Dr. Henry Abrash. We hosted our yearly High School Teacher Conference in November at Occidental College. For our last event of the year, our members went on a great tour of the Nutrilite Health Institute Center for Optimal Health.

Our first dinner meeting for this year will be on Wednesday, January 14, 2015 with a presentation entitled, "An Inside Look into a Sports Drug Testing Laboratory" by Dr. Anthony W. Butch from the Geffen School of Medicine at the University of California, Los Angeles (UCLA). You can read more about this event on page 3. Our February dinner meeting will feature an illuminating talk about climate science, in particular, "Measuring Atmospheric Carbon Dioxide from Space – NASA's Orbiting Carbon Observatory-2 (OCO-2)" by Dr. David Crisp, from the Jet Propulsion Laboratory/Caltech. For more information go to page 5.

In 2015 I hope to expand our programming to give more opportunity for social interactions as well as volunteer opportunities. I am inspired by the ACS Vision of "Improving people's lives through the transforming power of chemistry," and its Mission to "Advance the broader chemistry enterprise and its practitioners for the benefit of Earth and its people." In this spirit, I am looking to put together a team to start planning for next year's National Chemistry Week; please contact me if you interested in this or have any other programming ideas. Looking forward to great New Year.

- Veronica Jaramillo, Chair
vijaramillo@pasadena.edu

## Southern California Section

### Section Dinner Meeting

### Wednesday, January 14, 2015

### Billingsley's
11326 W Pico Blvd.
Los Angeles, CA 90064

## "An Inside Look into a Sports Drug Testing Laboratory"

### Anthony Butch
Professor of Pathology & Laboratory Medicine in the Geffen School of Medicine at the University of California, Los Angeles

**Check-in: 6:00 p.m.**
**Dinner: 7:00 p.m.**
**Presentation: 8:00 p.m.**

**Abstract:** The use of prohibited substances to gain a competitive edge in sporting events has been around forever and was practiced by ancient Greek athletes and Roman gladiators around the third century B.C. This practice continued over time and became problematic during modern Olympic Games held in the 20th century. Drug testing was introduced at the Olympic Games in 1968 but it had little impact on the practice of doping because the testing methods had poor analytical sensitivity and were unable to detect many of the doping agents that were being used. Analytical methods to detect doping have greatly improved over the last decade or so and drug testing laboratories are held to extremely high standards that are mandated by the World Anti-Doping Agency (WADA) accreditation program. Anti-doping laboratories face a huge task developing and validating tests to detect new performance enhancing drugs as they emerge onto the black market. This presentation will provide an inside view into the operations of the largest WADA-accredited laboratory in the world. An overview of WADA anti-doping rules and the prohibited list will be provided, along with details regarding the urine collection process and chain of custody documentation. Information regarding sample pretreatment, testing methods and data analysis will be discussed, as well as WADA

*(Continued on Page 4)*

## Southern California Section

**January Dinner Meeting (Abstract continued from Page 3)**

mandatory testing requirements and the external quality assessment program. Documentation supporting an adverse analytical finding during legal proceedings will be discussed and the 'now and then' of sports doping will be provided.

**Biography: Anthony W. Butch, Ph.D., DABCC, FACB, MT(ASCP),** is Professor of Pathology & Laboratory Medicine in the Geffen School of Medicine at the University of California, Los Angeles (UCLA). He is Chief of the Clinical Chemistry & Toxicology sections of the clinical laboratories at the UCLA Health System. He is also director of the UCLA Olympic Analytical Laboratory, a World Anti-Doping Agency-accredited laboratory that tests Olympic athletes and athletes at the high school, college and professional level for prohibited performance enhancing substances. Dr. Butch received his BS in Medical Technology from Wayne State University, his MS and PhD in Immunology from Wayne State University, and subsequent post-doctoral training in Clinical Chemistry and Immunology at Washington University. Dr. Butch joined the UCLA faculty in 1999 and has been an active member of the American Association for Clinical Chemistry and the World Association of Anti-Doping Scientists for many years. He has published more than 100 scientific articles, reviews, book chapters and case reports, serves on two editorial boards, and is an ad hoc reviewer for numerous journals.

***Reservations:*** There is a choice of Sliced Sirloin, Four Garlic Lime Shrimp over rice, Chicken Marsala or Rainbow Trout for dinner (make your choice at the restaurant). The cost is $32 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, January 12th.** ***Note:*** *Please honor your reservation. If you make a reservation and do not attend, you may be liable for the cost of the dinner.*

***Directions:*** Billingsley's is located at 11326 West Pico Blvd. L.A., CA 90064 west of the 405 Freeway. You can get directions from their website:
http://www.billingsleysteakhouse.com/#!location/c14xr. There is complimentary valet parking onsite (tip appreciated).

## Southern California Section

### February Section Meeting

### Date to be Announced (see www.scalacs.org)

**Pasadena City College**
1570 E Colorado Blvd.,
Pasadena, CA 91106

# Measuring Atmospheric Carbon Dioxide from Space – NASA's Orbiting Carbon Observatory-2 (OCO-2)


**David Crisp, Sr. Research Scientist**
**Jet Propulsion Laboratory/**
**California Institute of Technology**



**Abstract:** Fossil fuel combustion, deforestation, and other human activities are now adding almost 40 billion tons of carbon dioxide ($CO_2$) to the atmosphere each year. Interestingly, less than half of this $CO_2$ stays airborne. The rest is apparently being absorbed by natural processes at the surface, whose identity and location are poorly understood. Ground-based $CO_2$ measurements accurately record the global atmospheric $CO_2$ budget and its trends but do not have the resolution or coverage needed to identify the "sources" emitting $CO_2$ into the atmosphere or the natural "sinks" absorbing this gas. One way to improve the resolution and coverage of these measurements is to collect precise observations of $CO_2$ from an orbiting satellite. The Orbiting Carbon Observatory – 2 (OCO-2) is NASA's first satellite designed to measure atmospheric $CO_2$ with the accuracy, resolution, and coverage needed to identify its sources and sinks. OCO-2 was successfully launched on July 2, 2014. In early August, its instrument began recording more than 100,000 $CO_2$ measurements over Earth's sunlit hemisphere each day. Over the next two years, these measurements are expected to revolutionize our understanding of the processes controlling the atmospheric $CO_2$ buildup. This talk will describe the OCO-2 mission, summarize its measurement approach, and present some of its earliest results.

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## Southern California Section

**February Dinner Meeting (Continued from Page 5)**

**Biography:** Dr. David Crisp is an atmospheric physicist at the California Institute of Technology, Jet Propulsion Laboratory. Since receiving his Ph.D. from the Geophysical Fluid Dynamics Program at Princeton University in 1984, his basic research has focused primarily on the development of radiative transfer methods for remote sensing algorithms and climate models of Venus, Earth, Mars, and more recently, a few exoplanets. Dr. Crisp has served as an instrument provider and science team member for several NASA missions and was the Chief Scientist of the New Millennium Program, NASA's space flight technology program from 1997 to 2001. More recently, he was the Principal Investigator of the Orbiting Carbon Observatory (OCO) mission, NASA's first mission designed specifically to measure atmospheric carbon dioxide. Dr. Crisp is currently the leader of the Orbiting Carbon Observatory-2 (OCO-2) Science Team.

***Reservations:*** We will send a mass email as this event gets closer. Please check our website, www.scalacs.org, after the new year for more information.

***Directions:*** Please visit http://www.pasadena.edu/maps/ for directions and a map of the campus.

## Election Results

Thanks to everyone who voted in our first electronic election! Congratulations to our newly elected members. Their terms of office begin in January, 2015.

**Chair-elect:** Michael Morgan
**Secretary:** Barbara Belmont
**Members of the Executive Committee:** Gary Arevalo, Krishna Kallury and Ron Weiner
**Councilors:** Brian Brady and Virgil Lee
**Alternate Councilors:** Henry Abrash and Matthew Doyle

Congratulations to those who won the election and thanks to those who were willing to be candidates.

## Southern California Section

### Attention Job Seekers!

### One-Day Employment Workshop

### Saturday, February 7, 2014

### Occidental College
### Norris Chemistry 110

1600 Campus Road
Los Angeles, CA 90041

9:00 a.m.—4:00 p.m.

The Employment Committee of SCALACS is presenting a one-day workshop on job search strategies and tips on resume writing, personal branding, and networking. Discussion of the use of social media (e.g, Linkedin) will also be presented. The workshop will be interactive, so bring several copies of your resume and plenty of questions.

**Reservations:** Lunch is not provided, so a brown bag is suggested. Water and soda will be provided. **Seating is limited to 20 attendees, so please sign-up with Nancy Paradiso at office@scalacs.org by Monday, February 2nd.**

**Directions:** For directions and a map of the campus, please go to http://www.oxy.edu/page/maps-directions. There is free parking on campus on the weekend.

We are looking forward to seeing you there and we hope it will be beneficial in your job search.

Regards,
Brian Sullivan
Chair, Employment Committee

# Insights Into IP Law

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

This installment in the current series on inventorship addresses the phenomenon of simultaneous conception and reduction to practice of an invention. Recall from the September 2014 column that conception is the mental part of the invention--the formation in the mind of an inventor or inventors of a definite and permanent idea of the complete and operative invention as it is thereafter to be applied in practice. And "reduction to practice" (RTP) is the act of taking the invention from theory to reality by making an embodiment of the invention that operates according to its intended purpose (actual RTP), or by filing a patent application (constructive RTP).

Sometimes, particularly in unpredictable arts such as chemistry, an invention is not completely conceived until it is actually reduced to practice, e.g., through a successful experiment. This is referred to as simultaneous conception and reduction to practice. For example, conception of DNA encoding a human protein generally cannot be achieved until experiments that reveal the chemical structure of the DNA--the nucleotide sequence--have been performed. Conception of a chemical substance generally includes knowledge of both the specific chemical structure of the compound and an operative method of making it. Accordingly, conception of a chemical cannot generally be complete before the relevant chemical structure is known.

Even if the structure of, and method of making, a chemical is known, conception still might not be complete until there has been a reduction to practice. For example, although a group of scientists may speculate, prior to any experimental tests, that a known chemical might be used as an insecticide, conception of the invention of using such chemical as an insecticide might not be complete until the inventors have in mind what insects the chemical might be effective against and how the chemical might be applied to produce the desired results. Such information might be available only after successful tests of the chemical have been made.

An inventor need not necessarily know that his or her invention will work for conception to be complete. It is said that discovering that an invention actually works is part of its reduction to practice. But sometimes, an inventor does not fully know what the invention actually is until he or she has reduced the invention to practice, as seen above. Please email me at korso@irell.com with topics you would like to see addressed in 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.

# This Month in Chemical History

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

This compound is widely used as a solvent and reagent by chemists; it is a crucial component of our country's energy program; and it is an equally crucial component of beverages that many of us consume. Not a tough quiz is it? I refer of course to ethanol. These musings were prompted by an entertaining and enlightening short book that I recently acquired: "The Quest for Aqua Vitae; The History and Chemistry of Alcohol from Antiquity to the Middle Ages" by Seth C. Rasmussen. Dr. Rasmussen has been a key figure in the Division of the History of Chemistry of the ACS as its Program Chair for many years. The book is another contribution to the Springer short books on history of chemistry. Its many appropriate and attractive illustrations are another virtue of this volume.

Aqua Vitae means water of life. It is the same term that gives rise through a Celtic phrase to the word whisky (or whiskey depending on your preferred libation). It was given to ethanol by some of its earliest users around the 12th. century by virtue of its almost miraculous powers to restore the spirits (excuse the pun) of its partakers. Rasmussen discusses the wide variety of fermented beverages that have been in use since pre-literate times including the obvious wine and beer, and the lesser known mead (honey), date wine, palm wine, and kefir and kumis (milk). The history of alcohol is also closely entwined with the history of distillation, and reasonably concentrated ethanol was probably first isolated by distillation from grape wine in the 12th. century, perhaps at the famous medical school in Salerno in Italy.

Fermented beverages containing ethanol have been used in medicine since ancient times. Hippocrates, he of the oath (ca. 400 BCE), recommended wine for strengthening the body, as a purgative, and a diuretic. The Sumerians (ca. 2100 BCE) washed wounds with beer. Later cultures often treated wounds with wine and other fermented beverages, which were probably mild antiseptics. Palm wine was used by ancient Egyptians in perfumes, ink, incense –and in preparing bodies for mummification.

As to the origin of the term alcohol, the path Rasmussen traces is long and unexpected. The prefix al- shows its Arabic origin (alchemy, algebra, algorithm etc.). Kohl is a finely powdered preparation of stibnite, antimony trisulfide, used as a black eye makeup in Egypt as early as 1500 BCE. The term al-kohl came into use in Arabic to describe not just the kohl preparation but any kind of very fine powder. Its use was gradually extended to mean the finest and subtlest part and so, by extension, to materials obtained by distillation. Paracelsus in the 16th. century referred to aqua vitae as alkohol vini, the most subtle part of wine. Eventually the vini was dropped, the k westernized to c, and so the term alcohol was born.

# San Gorgonio Section

## Chair's Message

In keeping with the season, I would like to reflect on the past year (**San Gorgonio Section's 65th anniversary**) and look forward to the future. It has been a successful year for the Section. Here are a few of the highlights.

The Section has elected officers to all Executive Board positions. The first step into a digital election (delivering ballots electronically) was successful. Many thanks to all people who volunteered to run for a position, supported and participated in the election! Here is the **2015 Executive Board**:

**Chair** – Eileen DiMauro
**Chair-elect** - Dennis Pederson
**Treasurer** – Larry Mink
**Secretary** – David Srulevitch
**Councilor** – Ernie Simpson
**Councilor** – Eileen DiMauro
**Alternate Councilor** – James Hammond
**Alternate Councilor** – Laurie Starkey

The Section continued its participation in the **National Chemistry Olympiad** program. In March, 190 high school students from 17 schools sat for the Local Chemistry Olympiad competition at 5 different testing sites. Ten of those students advanced to the National Chemistry Olympiad competition at Cal State San Bernardino in April. Five students were awarded San Gorgonio section scholarships based on their performance on the exam. All of these students, along with the outstanding performer from each school, were recognized at the annual **Awards Banquet in May**.

The Section continued to promote the value of chemistry in everyday life by supporting **National Chemistry Week** outreach activities sponsored by U. C. Riverside, Cal Poly Pomona and Mt. San Antonio College. All of these activities were directed at children and families. For the senior members of our community, Section members with **50 or more years of ACS membership** were honored in a luncheon in October.

The first event of the 2015 will be on **February 20th**; Dr. Ernie Simpson's presentation of **"The Chemistry of Wine"** at Cal Poly Pomona. This event is wonderfully informative as well as a great deal of fun! Please see the meeting notice in this edition of SCALACS for more information.

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## San Gorgonio Section

### Section Meeting

### Dr. Ernie Simpson
### "The Chemistry of Wine"
### Friday, February 20, 2015
### 3:00 –5:00 pm

**3:00 – 4:15 pm Main Lecture and Samples**

**4:15 – 5:00 pm Decades of Wine: Limited Tasting and Auction (Extra Fee)**

**Collins College of Hospitality Management**
**Bldg # 79A, Wine Lecture Auditorium, Room # 1263**
California State Polytechnic University, Pomona
3801 West Temple Avenue
Pomona, CA 91768-2557

**See the San Gorgonio Section website (http:// sangorgonio.sites.acs.org) for complete details and registration form**

Dr. Simpson's lecture will include an overview of wine and wine making as well as detailed descriptions of the chemical composition of grapes and wine, laboratory methods for analysis of grapes and wines, sensory and organoleptic methods used for wine, the role of tannin and other phenolic compounds in wine and some potential health aspects of wine. Integrated with the talk will be wine samples to demonstrate the different components of wine and wine varieties. After the main lecture (3-4:15pm) for an extra fee, there will be special wines from six (6) "decades" available for limited tasting to illustrate how wine ages and an auction to raise money for the Dr. and Mrs. Simpson Collins College Scholarship.

**Biography:** Dr. Simpson joined the Chemistry Department at Cal Poly Pomona in 1968 after completing his BS, MS and Ph.D. (Organic Chemistry) at the University of New Mexico and spending one year as a visiting professor at Pomona College. In 1973/74 he was on leave as a visiting Research Associate in the Department of Enology and Viticulture at UC Davis. He is an active member of the American Society for Enology and Viticulture and has served on the editorial board of the society's journal. He has published a California Wine Guide. He is a member of the Society of Wine Educators and the American Wine Society. Dr. Simpson was named as an ACS Fellow in 2012 and in 2013 received the Provost's Award for Excellence in Service at Cal Poly Pomona.

**Wine Tasting:** All lecture attendees must be 21 years of age or older.
*(Continued on Page 12)*

## San Gorgonio Section

### Wine Tasting (Continued from Page 11)

**Reservations:** Strongly recommended as space is limited to the first 75 who register. Download registration form from San Gorgonio Section website. Reservations must be prepaid in cash or check and mailed to **Dr. J. Ernest Simpson**; **226 Cucamonga Avenue**; **Claremont, CA 91711-5015**. Reservations must be received no later than February 13, 2015.

**Cost:** $15.00 donation (includes main lecture with wine samples, crackers and cheese). Make check payable to: Cal Poly Pomona Foundation. On the note line add: Simpson Collins College Scholarship.

Special "Decades of Wines" will be available for limited tasting and/or auction for additional donation(s) beginning at 4:15 pm. Information on these wines and extra fees/auction prices will be posted on the San Gorgonio Section website.

**Directions: From Interstate 10**, take the Kellogg Drive exit. Heading south on Kellogg Drive, stay on the right lane and curve right onto University Drive. Stay on University Drive past 3 stop signs, then turn at the first left (Center Circle Road) up the hill to Kellogg West. **From I-57**, exit Temple Ave. Go north/west following Cal Poly signs past the lights at Valley Blvd. Turn right onto University Drive. Take the third right (Center Circle Road) up the hill to Kellogg West and the Collins College for Hospitality Management at the south end of the parking lot. A campus map can be found at www.kelloggwest.org, go to locations and points of interest and click on campus map.

### Chair's Message (Continued from Page 10)

Planning for 2015 Olympiad is underway. The Local Chemistry Olympiad competition will occur in March. The Board is considering changes to the current testing system to increase participation. Check the Section website for registration information.

I anticipate that 2015 will be as successful as 2014 and extend my sincere gratitude to all of the volunteers who so generously gave their time to make these events occur. Thanks to all of the ACS members who support the Section. Please continue to check SCALACS and the Section website for the latest information.

- Eileen DiMauro
Chair

## INDEX TO ADVERTISERS

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## Bi-Section Chemists' Calendar

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

**January**

14 SC Dinner Meeting with Prof. Anthony Butch—see page 3

**February**

11 SC Meeting at PCC with Dr. David Crisp—see page 5
20 SG Meeting—"The Chemistry of Wine" with Dr. Ernie Simpson at Cal. Poly. Pomona—see page 11