ACS Chemistry for Life™

Chicago Section

The Chemical Bulletin

http://chicagoacs.org **NOVEMBER • 2015**

CHICAGO SECTION AMERICAN CHEMICAL SOCIETY
MONTHLY MEETING
THURSDAY, NOVEMBER 12, 2015

LOCATION

Dinner:
The Greek Islands
300 East 22nd Street
Lombard, IL 60148

Tour:
The McCrone Group Laboratories
850 Pasquinelli Drive
Westmont, IL 60559

DIRECTIONS TO GREEK ISLANDS RESTAURANT

From the city: Take I-290 W to I-88 W. Exit right to the Highland Ave exit and use the left lane to take Highland Ave going north. Turn right onto E 22nd St. and the restaurant is on your left.

From the west: Take I-88 east to I-88 W. Exit right to the Highland Ave exit and use the right lane to take Highland Ave going north. Turn right onto E 22nd St. and the restaurant is on your left.

From the north: Take I-294 S to I-88 W. Exit right to the Highland Ave exit and use the right lane to take Highland Ave going north. Turn right onto E 22nd St. and the restaurant is on your left.

From the south: Take I-294 N to I-88 W. Exit right to the Highland Ave exit and use the right lane to take Highland Ave going north. Turn right onto E 22nd St. and the restaurant is on your left.

Parking: on site.

DIRECTIONS FROM GREEK ISLANDS RESTAURANT TO McCRONE GROUP

Take a left going east onto 22nd St. After 0.8 mi turn right (south) onto S. Meyers Rd for a mile to 31st St. and turn left. After 1.0 mi, turn right onto Midwest Rd. Turn left onto 35th St. after 0.5 mi. After 0.8 mi turn right onto Pasquinelli Dr. McCrone Labs will be 0.6 mi on the right.

REGISTRATION (GREEK ISLANDS) **5:00 PM – 7:30 PM**

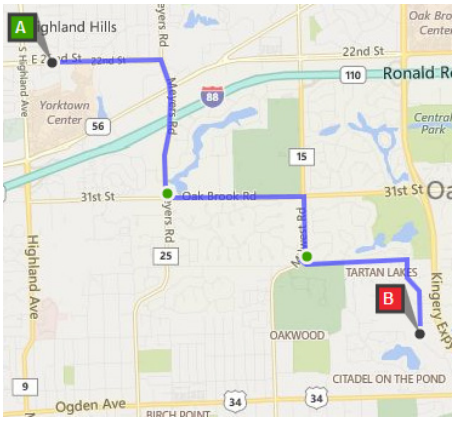
SOCIAL HOUR WITH CASH BAR AND WCC MENTORING SESSION **5:00 PM – 6:30 PM**

DINNER **6:30 PM – 7:30 PM**

TALK FROM McCRONE TECHNICAL DIRECTOR KENT RHODES **7:15 PM – 7:30 PM**

TRANSIT TO McCRONE GROUP **7:30 PM – 8:00 PM**

TOUR McCRONE GROUP LABORATORIES **8:00 PM – 9:15 PM**



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BIOGRAPHY

Kent Rhodes received a Bachelor of Special Studies in Chemistry and Mathematics in 1985 from Cornell College in Iowa. This was followed by an M.S. (1986) and Ph.D. (1990) from Northwestern in Inorganic Chemistry. He joined the electron optics group at McCrone Associates, Inc. in 1990. In addition to his management of technical services at McCrone Associates, he performs surface analysis using x-ray photoelectron spectroscopy, Auger spectroscopy, secondary ion mass spectrometry, and electron microprobe analysis. He also teaches in the Scanning Electron Microscopy course offered by Hooke College of Applied Sciences. He is a member of the American Chemical Society, American Vacuum Society, and Microbeam Analysis Society

ABOUT THE McCRONE GROUP

Founded in 1956 and located in Westmont, Illinois, The McCrone Group, Inc. is internationally recognized as a world leader in *microscopy, microanalysis, materials characterization, and the solving of tough materials problems*. Today, The McCrone Group, Inc. is regarded as "The Premier Microscopy Resource" and combines the talents and skills of its staff in the areas of materials analysis, instrument sales, and education.

The McCrone Group includes McCrone Associates, Inc.; McCrone Microscopes & Accessories, LLC; Hooke College of Applied Sciences, LLC; the McCrone Atlas of Microscopic Particles; and ModernMicroscopy.com.

McCrone Associates, Inc. is focused on solving the most difficult materials and particle identification problems along with the day-to-day analysis needs of clinical laboratories, scientific researchers, business organizations, and government agencies worldwide. Scientists at McCrone Associates consult directly with clients, and use the most advanced microscopy techniques and instrumentation to help solve their problems.

McCrone Microscopes & Accessories, LLC is the authorized dealer for Nikon light microscopes, Linkam heating/cooling stages, the JEOL NeoScope benchtop SEM, HiROX Digital Microscope Systems, digital imaging systems, and a variety of laboratory supplies. The technical sales representatives at McCrone Microscopes are trusted advisors to microscopists worldwide.

Hooke College of Applied Sciences, LLC provides education and training to scientists worldwide. In addition to undergraduate programs offered in collaboration with both North Central College and Concordia University Chicago, Hooke College of Applied Sciences has more than 40 specialized short-courses in materials analysis. Topics covered include light and electron microscopy, spectroscopy, sample preparation, chemistry and laboratory safety, and image analysis.

McCrone Atlas of Microscopic Particles is an online particle reference tool for scientists, microscopists, and criminalists engaged in materials characterization and particle identification. **Modern Microscopy** is an online collection of articles, scientific tips, and tutorials related to microscopy and microanalysis written by scientists from The McCrone Group and contributing scientists from around the world.

YOU HAVE ALMOST FINISHED YOUR BS/PHD/ POSTDOC IN CHEMISTRY - NOW WHAT?

Are you wondering what you'll do after completing your studies? Don't know how to get a job in the chemical field? Not sure of what you want to do? The Chicago Section Women's Chemist Committee will be sponsoring a mentoring session for all chemistry graduate, undergraduate and postdoctoral students, female and male, who are interested in getting jobs in chemistry, on Thursday, November 12, 2015 at 5:00 p.m. at Greek Islands Restaurant in Lombard. Members of the Chicago Section ACS with experience in corporate, academic and government settings will be present to help students with their résumé, answer career questions, and provide examples of the types of jobs available in chemistry today.

Immediately following this activity, students and postdocs are invited to attend the Chicago Section monthly dinner meeting at a subsidized cost. The topic of the short talk will be the McCrone Laboratories after which a tour of the McCrone Laboratories will be available. To sign up for the dinner and the tour or for further information or transportation possibilities, please call the Chicago Section ACS office at 847-391-9091 or check out the website at **http://chicagoacs.org/index.php**

Attendees at the dinner, female and male, are welcome to attend the student session and tell the students about your careers in chemistry. No previous preparation is necessary. Just come and sit down and share your story.

Menu

Family Style Dinner Menu

Appetizers: Saganaki, home madegyros, and taramoslata
Salad: Athenian salad
Entrée Choices: Sliced roast beef, vegeterian mousaka, spanakotiropita (spinach pie) chicken souvlaki, with sides of rice pilaf and potato or baked vegetables (briami)
Dessert & Coffee: Baklava, galaktoburiko, karidopita

The cost is $32 to Section members who have paid their local section dues, members' families, and visiting ACS members. The cost to members who have NOT paid their local section dues and to non-members is $34. The cost to students and unemployed members is $20.

Dinner reservations are required and should be received in the Section Office via phone (847-391-9091), email (**chicagoacs@ameritech.net**) or website (**http://chicagoacs.org/meetinginfo.php?id=101&ts=1445398820**) by noon on Monday, November 9. PLEASE HONOR YOUR RESERVATIONS. The Section must pay for all dinner orders. No-shows will be billed.

SOMEONE YOU SHOULD KNOW

Kathleen Carrado Gregar is known to all of us as the author of "ChemShorts for Kids" column. Katie is also an ACS Fellow (class of 2012). I first met Katie when we both joined the Elementary Committee, chaired by Richard Ebeling. We were developing a program called CHEERS which stood for Chemistry Elementary Education Refreshers. It was a "hands-on" workshop for elementary education teachers. In 1992, I was editor of the Chemical Bulletin and asked Katie if she would write a column to disseminate experiments for kids using common household products. Thus began the long relationship with Katie and her outstanding column called "ChemShorts for Kids".

Dr. Carrado Gregar was born in Rome, New York. She is the eldest of five children, four girls and one boy. Her father was a bricklayer, carpenter and home inspector. He built the home that she grew up in and became an officer in his professional organization. Her mother was a dental hygienist and homemaker. Katie is the first in her immediate family to go into science except for a younger cousin from Italy who is a Ph.D. chemist in France.

Katie began her college studies as an accounting major but later switched to geology when she learned that scientists could have careers! She was a latent geochemist, fascinated by the chemical properties of gems and minerals, born from family camping and hiking vacations. Katie was convinced by the chair of the chemistry department to go into chemistry after he told her that chemistry was the central science. She confesses that she would be a geologist if she did not go into chemistry, but she also had dreams of becoming an archeologist, tennis player, pharmacologist or national park ranger at different stages of her life.

Katie earned her bachelors in chemistry in 1982 from State University of New York (SUNY) at Fredonia. She pursued graduate studies because she wanted to do research. Katie earned her Ph.D. in inorganic chemistry in 1986 from the University of Connecticut. She studied under Professor Steven L. Stub and her thesis was "Aluminosilicates as controlled molecular environments for selective photochemical and catalytic reactions". Professor Stub, an alumnus from SUNY at Fredonia, had offered Katie a summer research project over the summer prior to graduate school. The project was a perfect fit since the research involved three-dimensional open framework silicates called zeolites, which fulfilled her love of geology.

Dr. Carrado Gregar started her career as a postdoc in the Chemistry Division at Argonne National Laboratory, and never left Argonne. She eventually became the leader of the Catalyst Design Group, working on catalysts and nanocomposities. After twenty years, Katie took a management position at Argonne's Center for Nanoscale Materials (CNM). This is a public user facility which allows researchers from all over the world to apply for access to CNM's capabilities and instrumentation. The access is free and very competitive. Her current job title is CNM User and Outreach Manager and a typical day involves management of user proposal routing and review, as well as safe and efficient user training and clearance. Katie is also responsible for promoting the results of staff and users to wider audiences, maintaining their website and Facebook presence and organizing workshops and scientific meetings.

Katie has been an ACS member since she was convinced by her undergraduate chemistry advisor, Phil Kumler, to join as a student affiliate in 1981. She became more involved after joining Argonne. Her boss at the time, Randy Winans, suggested that she volunteer as an officer in the Fuel Chemistry Division (now known as Energy & Fuels). Dr. Carrado Gregar has been the Division's Chair, Program Chair, and Councilor, and is now an Alternate Councilor for the Division. She states that, hands down, her favorite role has been the Chicago Section's curator of "ChemShorts for Kids".

You can always learn something about an individual by asking who they would want to eat lunch with dead or alive. Katie had difficulty selecting one person so her lunch table would have the following guests: Neal DeGrasse Tyson (living), Richard Feynman (dead) and Carl Sagan (dead). She feels they are very intelligent, accessible, and fun-loving. She would love to hear their answers to some of her questions about the universe.

Katie married Argonne's scientific glassblower, Joe Gregar in 1990 while she was a postdoc. She is a step-mother to his two children and a grandmother of four wonderful granddaughters. She has passed on her love of geology to one of her grandchildren. In her free time, Katie enjoys long walks with their dog Mica, traveling, and golf, and she is now taking piano lessons. Her quest is to hike in all 50+ national parks. So far she has hiked half of them.

Katie's final words of wisdom to all of us are to "Pay-it-Forward". It takes a lot of investment and sacrifice to become a chemist. It also takes some luck and mentoring. I believe it's our obligation to invest in future chemists and to educate the general public on the importance of chemistry's contribution.

Fran Kravitz

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CALENDAR

November 3: ACCA Seminar – Dr. Kerri Pratt (U of Michigan) *Chemical Interactions between Atmospheric Trace Gases, Particles, Clouds and Snow* at North Central College at 7pm in Larrance Academic Center, Rm 5.

November 10: ACCA Seminar – Dr. Elisabeth Moyer (U of Chicago) *Atmospheric Science: Global Warming* at North Central College at 7pm in Larrance Academic Center, Rm 5.

November 12: Chicago Section Dinner Meeting with the McCrone Group tour and WCC Career Event. **See details in this issue.**

November 17: ACCA Seminar – Dr. Pat Murray (Ecolab) *Responsible Use of Water in Industrial Processes a*t North Central College at 7pm in Larrance Academic Center, Rm 5.

December 4: Chicago Section Dinner Meeting with Lee Marek presenting.

CONGRATULATIONS TO ZAFRA LERMAN!

Zafra Lerman

The American Physical Society has awarded the 2016 Andrei Sakharov Prize to **Zafra Lerman**, President of the Malta Conferences Foundation and our distinguished speaker for the Chicago Section's June 2015 Monthly Meeting. She is being recognized for *outstanding leadership and/or achievements of scientists in upholding human rights*. The Sakharov Prize is in recognition of Andrei Sakharov, a Russian nuclear physicist who was an advocate of civil liberties and reforms in the Soviet Union, earning him the Nobel Peace Prize in 1975.

The biennial Malta Conference provides a forum using Science As A Bridge To Peace in the Middle East. Scientists throughout the region look to their neighboring countries to learn of research efforts in these countries even though the political boundaries may be greatly pronounced. For more information on the Malta Conferences, please visit: **http://www.aps.org/units/fip/newsletters/201402/malta.cfm**

The Chicago Section of the ACS has been a strong supporter of the Malta Conferences and invites you to help in their success. **http://www.maltaconferencesfoundation.org/donate.html**

MUSINGS ON BERRIES

Eating a handful of berries is good for you and if you add those berries to your morning cereal maybe it will balance out that sugar covered grain. Berries in the form of juice contain interesting ingredients. Red berry juice often has apple and grape juice in it. It may be that the juice is really just a few drops of a concentrate. As to the calories, these juices are loaded, almost as much as your favorite cola.

Fresh raw foods, such as berries, often claim that they are organic and that they do not contain chemicals. These berries by themselves may reduce the risk of cancer due to their plentiful antioxidants. Then there are those berries that are not popular and are not grown in any large commercial amounts, which means that a higher than usual price can be charged. With regard to health they all have about the same level of antioxidants.

Berries are best tasted the second they are picked, but unless you're willing to pick them under the hot sun, the road-side stand is the next best choice. Those little plastic containers are time stamped when they are filled. Just look at the bottom to find out how long they have been picked before you buy. This might mean that the product, if picked more than a week ago, has been covered with CO_2 gas to slow the berry from aging. When the berries come from overseas, the harmless gas will keep them fresh until the gas dissipates and the berries resume their own aging process. If you cannot get berries fresh, try them as dried fruit. Flash drying berries requires that they are blasted by air that is way below freezing (-40°). The frozen crystals are air dried and the taste is kept in the berry.

RICHARD CORNELL

"CHEM SHORTS" For Kids

Dancing Worms

Kids, in a variation of Dancing Raisins (ChemShorts for Kids, Feb. 1992; http://chicagoacs.org/articles.php?id=30), let's make some colorful Dancing Worms!

You'll need gummy worms, baking soda (sodium bicarbonate), water (H_2O), vinegar (dilute acetic acid), 2 glasses, and scissors.

With an adult partner's help, use the scissors to cut the gummy worms in half or into quarters lengthwise. You want long, thin strips of worm. Drop the worm strips in one glass. Add a couple of spoonfuls of baking soda and enough water to dissolve some of the baking soda. If all of the baking soda dissolves, add more until some undissolved powder remains. Let the worms soak in the baking soda solution for 15 minutes to half an hour.

Pour vinegar into the other glass and drop a baking-soda-soaked worm into the vinegar. What happens? At first, nothing much. But after a while bubbles start to form on the surface of the worm. Then the worm starts to move. After some time, the reaction stops and the worm slows down and stops moving entirely.

Why Do the Worms Move? The gummy worms wriggle because a chemical reaction between sodium bicarbonate and acetic acid produces carbon dioxide gas. The tiny gas bubbles released by the reaction stick to the body of the gummy worms, eventually merging into bubbles big enough to float part of the worm. If the gas bubble detaches, it floats to the surface while that part of the gummy worm sinks back down.

Tips for Success

If your worms never dance then have an adult partner cut them thinner. A thinner gummy worm is a lighter gummy worm and thus much easier to make move. Thin worms absorb baking soda better, too. Or you can try adding more baking soda to the soaking solution or soaking the worms longer. The baking soda needs to get into the gelatin that makes up the worms so that it can react with the vinegar to make bubbles.

Reference:

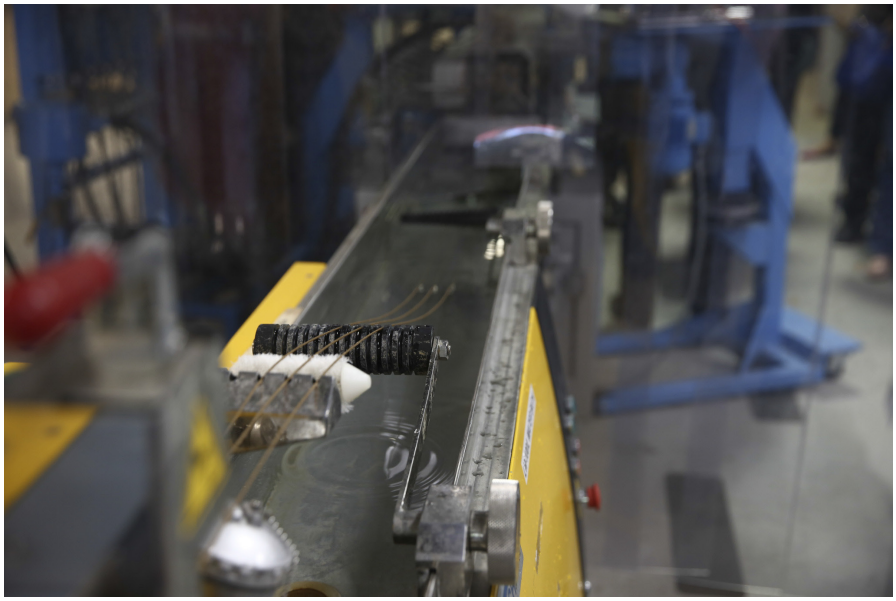
http://chemistry.about.com/od/chemistryactivities/fl/Frankenworms-Dancing-Gummy-Worms-Science-Experiment.htm

Editor, DR. KATHLEEN CARRADO GREGAR, Argonne National Laboratory
To view all past "ChemShorts for Kids", go to: http://chicagoacs.org/articles.php?article_category=1

A WEEK IN ONTARIO - #2

Last month I introduced the background of what I will be talking about in this series regarding the chemical industry in Ontario. A large portion of what was introduced was the agricultural scene in the province. Roughly 60% of all of Canada's crops are harvested in Ontario. They are seeing a large switch from petroleum feedstock to biomass as the means to the chemical industry's products. This month's article will focus on the cooperative efforts between the local farmers, higher education, and the chemical industry.

The tour began 60 miles west of Toronto at the University of Guelph, ranked as the #1 college in Canada and 12th in the world (just ahead of U. of Wisconsin) for Agricultural Sciences, and has roughly 20,000 undergraduates and an additional 2,100 graduate students. A large contingency of a highly coordinated network of farmers, industrialists and entrepreneurs informed us of their combined resources. The Grain Farmers of Ontario is an organization of 28,000 farmers growing 6,000,000 acres of barley, corn, oats, soybeans, and wheat. The ultimate goal of the organization is to promote and innovate for their members to grow profits. It is funded solely by the farmer members. The economic impact is $2.5 billion/yr leading to $9 million in economic output/yr and 40,000 jobs. In the past 5 yrs they have committed $1.5 million towards innovations in the bioeconomy, typically as a funding partner in research and industry. Similarly the



"Extruder at the University of Guelph"

Ontario Federation of Agriculture looks to supply biomass for bioenergy applications, beginning with the transformation of biomass to biochemicals, and biocomposites to bioplastics and finally energy and export. Soy 20/20 is a not-for-profit corporation whose mission is to develop new bio-science opportunities for Canadian soybeans, funded by the government and private industry (farmers and others). They work toward finding opportunities in lubricants, plastics, polyols, and paints and coatings. The Bioproducts Discovery & Development Centre http://www.bioproductscentre.com/ at the University of Guelph has many projects in the works but have focused on taking bioproducts and making biochemicals and biomaterials before sending them off to biofuels – saving the combustion of these feedstocks for the last and least useful purpose of the product (transportation and heating). Woodbridge Car Manufacturing, Club Coffee, and Competitive Green Technologies are companies that have taken advantage of the consortium of groups listed above. These organizations have done an outstanding job of coordinating their efforts to convert to a bio-based economy that is paying off for their agricultural and industrial partners.

It is difficult to find information in Illinois about resources of the sort that exist in Ontario. The University of Illinois Extension Office is a major resource for us in terms of finding out what research is currently ongoing with agricultural feedstocks, but there does not appear to be a concerted effort in taking one of Illinois' greatest domestic products and using it for anything other than the traditional food products with some conversion to biofuels. The University of Illinois (UC) has an Integrated Bio-processing Research Laboratory but it does not have the same kind of cohesiveness with the farmers and industry as exists in Ontario.

Next month I will spend more time on the chemical industry particularly around the Sarnia region.

PAUL BRANDT

Register ONLINE for Chicago Section monthly meetings

http://www.chicagoacs.net/register.php

The mission of the Chicago Section of the ACS is to encourage the advancement of the chemical sciences and their practitioners.