

# THE Indicator

APRIL 2013

Vol. 94 • No. 4

ISSN0019-6924



**Dr. Stephen Z. Goldberg**  
**NY Section's Outstanding Service Awardee**  
*(See page 6.)*

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## Press Releases

### **U.S. INTERNATIONAL TRADE COMMISSION EXTENDS ANTIDUMPING ORDER ON ACTIVATED CARBON IMPORTS FROM CHINA**

PITTSBURGH — (BUSINESS WIRE) — Calgon Carbon Corporation (NYSE: CCC) reported that the U.S. International Trade Commission (ITC) announced today that the antidumping order on imports of steam activated carbon imported into the U.S. from China will remain in effect for at least five years.

Importers of Chinese activated carbon will be required to make cash deposits of estimated antidumping tariffs when the carbon enters the U.S. Tariff rates will be determined annually by the U.S. Department of Commerce (DOC). At the end of the five-year period, the DOC and ITC will conduct a second "sunset" review to determine if the antidumping order should be continued.

The current average tariff rate which, was announced by the DOC in November of 2012, is \$0.47 per pound and will remain in effect until November 2013. Calgon Carbon's tariff on activated carbon imported into the U.S. from China is currently \$0.00.

Randy Dearth, Calgon Carbon's president and chief executive officer, commented, "We are very pleased with the ITC's decision, and are optimistic that during the next five years the antidumping order on Chinese activated carbon will encourage fair market pricing that reflects demand and manufacturing costs for activated carbon produced in the U.S."

Calgon Carbon Corporation, headquartered in Pittsburgh, Pennsylvania, is a global leader in services and solutions for making water and air safer and cleaner.

For more information about Calgon Carbon's leading activated carbon and ultraviolet technology solutions for municipalities and industries, visit [www.calgoncarbon.com](http://www.calgoncarbon.com).

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The monthly newsletter of the New York & North Jersey Sections of the American Chemical Society. Published jointly by the two sections.

**CONTENTS**

Advertisers Index	24
Call for Nominations	22
New York Meetings	7-13
New York Sectionwide Conference	14-15
NY Outstanding Service Awardee	6
North Jersey Meetings	18-19
Others	19-22
Press Releases	2, 23
Professional/Product Directory	24

**EDITORIAL DEADLINES**

May	March 20
June	April 20
September	July 20
October	August 20
November	September 20
December	October 20
January 2014	November 20
February	December 20, 2013
March	January 20, 2014
April	February 20

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The Indicator (ISSN0019-6924) is published monthly except July and August by the New York and North Jersey Sections of the American Chemical Society, Office of Publication, 1 Milbark Court West, Homosassa, FL 34446. Periodicals Postage Paid at Homosassa, Florida and at additional mailing offices.

**POSTMASTER:** Send address changes to American Chemical Society, Department of Member and Subscriber Services, THE INDICATOR, P.O. Box 3337, Columbus, OH 43210, or e-mail: [service@acs.org](mailto:service@acs.org).

All views expressed are those of the editor and contributors and do not necessarily represent the official position of the New York and North Jersey Sections of the American Chemical Society unless so stated. Subscription price included in dues paid by New York and North Jersey Section members. Distributed electronically to members through the website [www.TheIndicator.org](http://www.TheIndicator.org) and monthly emailings. Non-members are invited to read it online. Members should register their email addresses at [www.acs.org/editmyprofile](http://www.acs.org/editmyprofile).

Address advertising correspondence to Advertising Manager. Other correspondence to the Editor.

## April Calendar

### NEW YORK SECTION

**Thursday, April 4, 2013**

Long Island Subsection  
See page 7.

**Thursday, April 4, 2013**

Chemical Marketing & Economics Group  
See page 7.

**Monday, April 8, 2013**

MetroWomen Chemists  
See page 18.

**Thursday, April 11, 2013**

Westchester Chemical Society  
See pages 7-8.

**Friday, April 19, 2013**

New York Section Board Meeting  
See page 7.

**Friday, April 19, 2013**

High School Teachers Topical Group  
See page 8.

**Saturday, April 20, 2013**

NY Section Earth Day Walk  
See pages 8-9.

**Tuesday, April 23, 2013**

Biochemical Topical Group  
See page 9.

**Thursday, April 25, 2013**

Long Island Subsection 13th Annual  
Chemistry Challenge  
See page 10.

**Friday, April 26, 2013**

Hudson-Bergen Chemical Society  
See pages 10-11.

**Wednesday, May 1, 2013**

Westchester Chemical Society  
See page 11.

**Thursday, May 2, 2013**

Brooklyn Subsection  
See page 12.

### NORTH JERSEY SECTION

**Monday, April 8, 2013**

Careers in Transition Group  
See page 18.

**Wednesday, April 10, 2013**

North Jersey Teacher Affiliates  
See page 18.

**Thursday, April 18, 2013**

MetroWomen Chemists  
See page 18.

**Friday, April 19, 2013**

NoJ Section's 65th Annual Undergraduate  
Research Conference  
See page 19.

**Monday, April 29, 2013**

North Jersey Executive Committee Meeting  
See page 18.

**Deadline for items to  
be included in the  
May 2013 issue of  
*The Indicator* is  
March 20, 2013**

***The Indicator* is  
posted to the web on  
the 15th of the  
previous month at  
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## THIS MONTH IN CHEMICAL HISTORY

Harold Goldwhite, California State University, Los Angeles  
• [hgoldwh@calstatela.edu](mailto:hgoldwh@calstatela.edu)

In this column I will continue with events in 1913 for which we might celebrate the centenary in 2013. Let's start with the award in 1923 of the Nobel Prize in chemistry to the Austrian chemist Fritz Pregl for his work on the microanalysis of organic compounds. No, I haven't goofed on the math. The essential kernel of this work was first published in 1913. Pregl was born in Slovenia in 1869 and studied physiological chemistry at the University of Graz. His doctoral advisors were Ostwald and Emil Fischer. After a short spell at Innsbruck he returned to Graz in 1913 as head of the Department of Chemistry at the medical school. He became frustrated in his work in biological chemistry on bile acids by his inability to analyze small samples. This led him to explore the possibility of doing combustion analyses for carbon, hydrogen, and nitrogen on milligram amounts of material. In this endeavor he was inspired by the pioneer work of another Austrian chemist, Friedrich Emich, who developed microchemical methods for inorganic analysis.

In collaboration with an instrument maker Pregl had a balance built that could weigh up to 20 grams with a precision of a microgram. He then embarked on a ten year odyssey of painstaking analytical work, emphasizing the elimination of errors. By the early 1920s Pregl's work had become reliable and reproducible, and in a series of articles and books he shared his results with other chemists. It is no exaggeration to say that he revolutionized the practice of organic chemistry. He reduced the size of analyzable samples by a factor of 50, making the analysis of rare and hard to extract organic materials a routine operation. His Nobel prize was hard earned and fully justified.

The Nobel prize for chemistry in 1913 was won by the Swiss chemist Alfred Werner, another chemical revolutionary – this time in inorganic chemistry. Werner was born in Alsace in 1866 and early on showed an interest in chemistry. After military service he was admitted to the Technical High School in Zurich where he earned his diploma in 1889. Impressed by Hantzsch's lectures he became his assistant and began working on the stereochemistry of the nitrogen center in oximes, earning his doctorate in 1890. After a brief post-doctoral stay in Paris with Marcellin Berthelot he returned to Zurich where he was appointed Professor at the age of 29. He was charged initially with lecturing on organic chemistry, and later on inorganic chemistry. At that time there was little understanding of the constitution of coordination compounds. Current theories tried to develop chain-like structures, similar to those of organic compounds. In what Werner himself described as a flash of inspiration he developed and published in 1893 his new insights into coordination chemistry. Using modern terminology Werner intuited that the oxidation state of the metal ion controlled the number and geometry of ligands arranged around it. With his collaborators he spent the next 20 years exploring the implications of his theories making extensive use of physical measurements including electrochemistry. (Recall that x-ray diffraction was still in the future). His predictions extended to optical isomerism in specific coordination compounds, which he eventually was able to prove experimentally. His book "New Ideas in Inorganic Chemistry" published in 1904 gave currency to his views that soon became the accepted interpretation of coordination chemistry. Werner suffered from arterial problems, and was an alcoholic. He died in 1919 aged 53.

A reminder : I have just published "A Chemical Chrestomathy: Chemical History Sketches, Vol. 1: Chemists". It is available (at a modest price!) from [Amazon.com](http://Amazon.com). Just search for the title. The book contains many short sketches of the careers of chemists, slightly modified from the forms in which they first appeared in a number of ACS Local Section journals.

## Outstanding Service Award

Dr. Stephen Z. Goldberg, Professor of chemistry at Adelphi University, is the recipient of the ACS New York Section's Outstanding Service Award for 2012. The award is presented annually, at the January Sectionwide Conference, to recognize the efforts of members of the New York Section who provide their time, leadership skills and dedicated service to promote high quality programs that contribute to the excellence of the Section. Stephen's leadership continues to further the goals and ideals of the ACS New York Section. His service spans a wide range of activities, but his special interest is in providing opportunities for and recognition of outstanding high school chemistry students.

At the Section level, Stephen has served as chair of the Chemistry Olympiad Committee since 1999 and as chair of the Awards Committee since 2003. Since 2004 he has been an active member of the Chemagination Committee, which organizes a New York Section science competition for high school students. He was the treasurer of the Section and a member of its Board of Directors from 2006-2011. As treasurer, Stephen served on the Finance Committee. Additionally, he was an Alternate Councilor from 2006 to 2008. He is especially proud of his work as chair of the Olympiad Committee. Each year more than 300 high school students from the New York area participate in a process which culminates with a team of four outstanding students representing the United States at the International Chemistry Olympiad. 2012 was a banner year for the New York Section, since Christopher Hillenbrand, a student at Regis High School, won a gold medal at the international event which was held in Washington, D.C.

Within the Long Island Subsection of the ACS New York Section, Stephen served as Chair of the Education Subcommittee in 1981-82. From 1997 to 2005 he served on the Board as a Director at Large.

The ACS New York Section truly appreciates Dr. Stephen Goldberg's continued dedication to the Section, especially his exemplary work with the Olympiad Program, and extends a sincere thank you.



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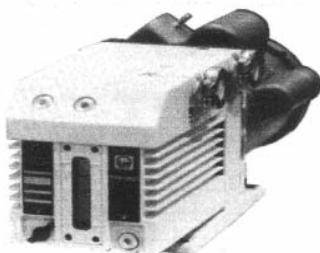
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## New York Meetings

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### NEW YORK SECTION BOARD MEETING DATES FOR 2013

The dates for the Board Meetings of the ACS New York Section for 2013 were chosen and approved at the November 30, 2012 Board Meeting. The meetings are open meetings – all are welcome. If non board members would like to attend the meeting, please let the New York Section office know by emailing Mrs. Marilyn Jespersen at [njesper1@optonline.net](mailto:njesper1@optonline.net) or calling the office at (516) 883-7510.

The 2013 Board Meetings will be held on the following Fridays at 6:30 PM at St. Johns University, D'Angelo Center, Jamaica, NY. Dr. Philip H. Mark will chair the meetings.

#### Friday, April 19

Friday, June 7

Friday, September 27

Friday, November 15

More information will be posted in future issues of *The Indicator* and on the New York website at <http://www.NewYorkACS.org>.



### LONG ISLAND SUBSECTION

**Date:** Thursday, April 4, 2013

**Place:** Hofstra University  
Room and speaker TBA



### CM&E ACS NY SECTION

**In Search of the Alchemy of Growth**

**Speaker:** G. Sam Samdani, PhD  
McKinsey & Company

**Host:** Karin Bartels  
Principal in Ipintech



In search of the alchemy of growth when it's so tough to be special. After the turmoil of the 1990s, the specialty chemicals industry has done much over the last decade to get its house in order. Now the established specialty chemical players must carefully think through how some of the recent segment-specific trends and developments will affect their businesses over the next 5-10 years

and respond accordingly. To this end, our invited speaker plans on exploring a range of thought-provoking questions such as the following:

- Are you prepared to tackle the quantum changes in the multi-speed chemical markets or are you just playing along for mere survival?
- How does a specialty chemical player put its enterprise ahead of market trends and discontinuities and thus get ahead of its competitors in capturing attractive growth opportunities?

G. Sam Samdani, PhD, is a senior knowledge expert at McKinsey & Company, a global management consulting firm. His responsibilities include leading the specialty chemicals service line in the Americas within the firm's Chemicals Practice, and offering segment-specific expertise with particular emphasis on innovation, performance transformation, corporate portfolio & business unit strategies, and M&A due diligence support for major private equity players and chemical companies worldwide.

**Date:** Thursday, April 4, 2013

**Time:** 11:00 AM - 2:00 PM

**Place:** The Penn Club  
30 West 44th Street  
New York, NY

**Cost:** Luncheon Fee: \$90 for non-CM&E members; \$70 for 2013 CM&E, ChemPharma members  
Webcast Fee: No Charge for ACS members. Others \$30 – check website for earlybird discounts.

**Registration:** <<http://www.cmeacs.org>>



### WESTCHESTER CHEMICAL SOCIETY

**Special Seminar – “Modeling Protein-DNA Interactions at Electrified Interfaces”**

**Speaker:** Keeshan Williams\*  
The Polytechnic Institute of NYU  
Department of Chemical and Biological Engineering  
Brooklyn, NY

Coupling self-assembled monolayer (SAM) techniques with biodiagnostic applications has led to custom made electrochemical sensors that can be produced with relative ease, in multiplexed formats, and at low cost. For example, DNA monolayers have been used to detect complementary sequences within complex sample matrices as well as to elucidate the thermodynamic and kinetic param-

(continued on page 8)

## WESTCHESTER CHEMICAL SOCIETY

(continued from page 7)

ters of binding various species (e.g. proteins, small molecules) to DNA. Here, electroactively labeled, double stranded DNA (dsDNA) monolayers are interrogated using alternating current voltammetry (ACV) to monitor association between a transcription factor protein and the monolayer. Various ACV input frequencies are tested to determine those most sensitive to protein binding, and concentration series are performed to generate Langmuir-type binding isotherms for quantitative determination of binding affinities. Because the DNA binding reaction is coupled to protein dimerization in solution a model that accounts for coupling between the two equilibria is needed to fully characterize the experimental data. This presentation will discuss optimization of the experimental approach as well as model-based extraction of thermodynamic parameters for protein-DNA interactions using a classical biomolecular systems derived from bacteriophage lambda.

Mr. Williams received a B.A. degree in Chemistry from Queens College, City University of New York, Flushing, NY, in 2005. Upon graduation, he worked as a Chemist for a materials testing laboratory in College Point, NY. While pursuing his Masters of Science in Chemical Engineering at NYU-Poly he also worked as a Materials Engineer for the Port Authority of New York and New Jersey. In 2008, he started pursuing a Ph.D. degree in Chemical and Biological Engineering at NYU-Poly.

\* *Coauthor: Rastislav Levicky, Polytechnic Institute of NYU.*

**Date:** Thursday, April 11, 2013

**Times:** Refreshments 5:30 PM  
Lecture 6:00 p.m.

**Place:** Westchester Community College  
Gateway Building Room 110  
75 Grasslands Road  
Valhalla, NY

**Cost:** Free and open to the public

For more information, contact Paul Dillon:

E-Mail [PaulWDillon2@hotmail.com](mailto:PaulWDillon2@hotmail.com)

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## HIGH SCHOOL TEACHERS TOPICAL GROUP

**Annual "DEMO DERBY"**

An evening of non-stop demonstrations by the attendees (5-8 minutes max.) Note that because of renovations to Silver room 207, there is no sink or water. All demos must be self-supplied, including cleanup and safety equipment.

**Date:** Friday, April 19, 2013

**Time:** Social and Dinner — 5:45 PM

**Place:** No reservations required  
M&G Pub (Murphy and Gonzales)  
21 Waverly Place (at Green Street,  
North-east corner)  
New York, NY

**Time:** Meeting — 7:15 PM

**Place:** New York University  
Silver Center Room 207  
32 Waverly Place (South-east  
corner Washington Sq. East)  
New York, NY

Security at NYU requires that you show a picture ID to enter the building. In case of unexpected severe weather, call John Roeder, (212) 497-6500, between 9 AM and 2 PM to verify that meeting is still on; (516) 385-4698 for other info.

Note: For those who prefer indoor attended parking, it is available at the Melro/Romar Garages. The entrance is on the west side of Broadway just south of 8th Street, directly across from Astor Place. It is a short, easy walk from the garage to the restaurant or meeting room.



## NY SECTION'S SECOND ANNUAL EARTH DAY PARADE

**Walk the Brooklyn Bridge**

The New York Section's Second Annual Earth Day Parade, "Walk the Brooklyn Bridge" will be hosted by Pace University on **Saturday, April 20, 2013!**

Dr. JaimeLee Rizzo, 2012 Immediate Past Chair of the Section and Coordinator of the Earth Day Event will organize the parade. Earth Day was first officially recognized on April 22, 1970 as a way to demonstrate support for a healthy environment, raise awareness about environmental issues, and remind people that we all need to contribute to a sustainable planet. Each year, ACS highlights one of four general topics (water, air, plants/soil or recycling) and chooses a specific "theme name" under the topic to focus the CCED celebration.



This year's theme is, "**Our Earth: Handle with Care!**"

ACS local sections, Student Member Chapters, and divisions are encouraged to take part in the celebration, particularly the annual community event. To register for the "Walk the Brooklyn Bridge, for more information, and to see photos from last year's event please go to our official Earth Day website: <http://www.newyorkacs.org/meetings/EarthDay/CCED.php>



## BIOCHEMICAL TOPICAL GROUP — JOINT MEETING WITH THE NYAS BIOCHEMICAL PHARMACOLOGY DISCUSSION GROUP

### Targeting Insulin Resistance for the Treatment of Alzheimer's Disease: From Laboratory to the Clinic

**Organizers:** Mercedes Beyna  
Pfizer Global Research and Development

Cathleen Gonzales  
Pfizer Global Research and Development

Barbara Petrack, PhD  
Drew University

Jennifer Henry, PhD  
The New York Academy of Sciences

**Speakers:** Suzanne DeLaMonte, MD, MPH  
Brown University

William H. Frey II, PhD  
Alzheimer's Research Center

José A. Luchsinger, MD, MPH  
Columbia University Medical Center

Mark P. Mattson, PhD  
National Institute on Aging, NIH

Ewan C. McNay, PhD  
University at Albany, SUNY

Konrad Talbot, PhD  
University of Pennsylvania

Despite tremendous efforts, no disease-modifying drug for Alzheimer's disease (AD) is available. Mounting evidence links AD and type-2 diabetes mellitus (T2DM). Impairment in insulin receptor transduction pathways have been shown to affect two critical players in the pathology of AD: amyloid precursor protein (APP) and tau. Intranasal insulin and two drugs currently used to treat T2DM, metformin and the incretin hormone Exendin-4, are currently being tested in clinical trials for mild cognitive impairment (MCI) and AD. This symposium will highlight the role of insulin resistance in AD, review recent preclinical data supporting the use of antidiabetic drugs to ameliorate AD pathology, and explore the current status of clinical trials using insulin and insulin-sensitizing agents for the treatment of MCI/AD.

**Date:** Tuesday, April 23, 2013

**Time:** 12:00 – 5:00 PM (reception included)

**Place:** New York Academy of Sciences  
7 World Trade Center  
250 Greenwich Street – 40th Floor  
New York, NY 10007

**Cost:** This event is FREE for ACS and NYAS members. Please select the appropriate non-member Registration Category and use the Priority Code ACS. Non-members may attend for a fee of \$30, or \$15 for students and post-docs.

For more information and to register for the event, go to: [www.nyas.org/ADandInsulin](http://www.nyas.org/ADandInsulin)

To become a Member of the Academy, visit [www.nyas.org/benefits](http://www.nyas.org/benefits)

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## LONG ISLAND SUBSECTION

### The 13th Annual LIACS Chemistry Challenge

The Long Island subsection of the NY-ACS invites you to participate in the 13th Annual Chemistry Challenge to be held at Queensborough Community College. This is a chemistry knowledge competition (similar to Jeopardy!) between student teams from local two- and four-year institutions. Each team consists of three members. There will be forty-five, timed multiple choice questions (approximately 75% General and 25% Organic Chemistry). Students will discuss the questions among team members and select their answer using clickers. The atmosphere is exciting and brings students and faculty mentors together. Medals and prizes will be awarded to the first, second, and third place winners. So the question is, will you accept the challenge??!

**Date:** Friday, April 26, 2013

Times: Dinner 5:00 PM

Chemistry Challenge 6:00 PM

Place: Queensborough Community College  
Science Bldg S-111

Contact: Paris Svoronos at [psvoronos@qcc.cuny.edu](mailto:psvoronos@qcc.cuny.edu) or Luis Vargas at [lvargas@qcc.cuny.edu](mailto:lvargas@qcc.cuny.edu) for directions and parking information or visit the LI-ACS website at [http://www.newyorkacs.org/sub\\_island.php](http://www.newyorkacs.org/sub_island.php).



## HUDSON-BERGEN CHEMICAL SOCIETY SIGMA XI CHAPTER — JOINT MEETING WITH THE SCHOOL OF NATURAL SCIENCES OF FAIRLEIGH DICKINSON UNIVERSITY

### The 15th Annual Undergraduate Research Symposium

This is a forum for undergraduate students and their faculty mentors from colleges and universities that participate in the subsection's activities to present the results of their research. Outstanding graduating students are also being recognized (they receive the Hudson-Bergen Chemical Society Award consisting of a certificate and a book). All the presenters will receive certificates and a book. Students who wish to present posters

must send an abstract via e-mail to [mleonida@fdu.edu](mailto:mleonida@fdu.edu), by April 12, 2013. The abstract should be in MS Word format and must include the names and addresses of the student(s) and their faculty adviser(s) in addition to the title of the abstract. The abstract should not exceed 200 words. The name of the student presenting the poster should be underlined. The posters have to be self-supported. There is no registration fee.

This year's symposium also features the lecture:

### Computational Enzyme Redesign with Natural and Non-natural Alphabets

*Speaker:* Sagar Khare, Ph.D.  
Rutgers University

The custom design of enzymes provides a rigorous test of our understanding of the principles of molecular recognition and catalysis. A combined computational-experimental approach for enzyme design will be described. Applications of this approach include introducing new reactivity in otherwise inert scaffold proteins, repurposing the reactivity of existing enzymatic active site functional groups for novel reactions, and the design of proteins with non-natural amino acids. Specifically, two recent design efforts will be presented: (a) A zinc-containing murine adenosine deaminase enzyme has been redesigned to catalyze the hydrolysis of an organophosphate pesticide with a catalytic efficiency  $k_{cat}/K_M \sim 10^4$  (M<sup>-1</sup>s<sup>-1</sup>). (b) Metal-binding sites featuring the non-natural amino acid 2,2'-bispyridyl alanine were introduced into an active site. These results provide insights into the physical-chemical principles underlying molecular recognition and catalysis, and highlight avenues for further improvement of the design methodology.

Dr. Khare is an Assistant Professor of Chemistry and Chemical Biology at Rutgers. He was a postdoctoral fellow at the University of Washington Seattle and the Howard Hughes Medical Institute, where he worked in the area of computational enzyme design - he developed approaches to redesign enzymes for new reactions, and for de novo design of small molecule binding sites in proteins. Dr. Khare's laboratory is taking a combined computational-experimental approach for designing novel functional proteins bottom-up, for eventual applications in therapeutics and bioremediation.

Dr. Khare received his undergraduate degree

in Biochemical Engineering and Biotechnology at the Indian Institute of Technology (IIT), Delhi, India and a PhD from University of North Carolina, Chapel Hill.

**Date:** Friday, April 26, 2013

Times: Poster Session 5:00 PM

Pizza Dinner 6:00 PM

Awards and Lecture 7:00 PM

Place: Jeepers Café

Fairleigh Dickinson University

Teaneck, NJ

Cost: \$10.00 for dinner (dinner cost for presenters will be waived).

Reservations: Dr. Mihaela Leonida (201) 692-2338, e-mail: [mleonida@fdu.edu](mailto:mleonida@fdu.edu) by April 10, 2012.



## WESTCHESTER CHEMICAL SOCIETY

### THE DISTINGUISHED SCIENTIST AWARD AND DINNER AND COLLEGE STUDENT ACHIEVEMENT AWARDS

#### One Droplet at a Time: Crystallization at the Liquid-Liquid Interface

*Speaker:* Sunghee Lee, Ph.D.  
Chair, Department of Chemistry  
Iona College  
New Rochelle, NY

Our research focuses on the interfacial chemistry of aqueous microdroplets mediated by self-assembled structures at the liquid-liquid interface. A major focus is the nucleation of crystals in single aqueous nanoliter microdroplets surrounded by an oil phase. This offers numerous advantages to crystal science, owing to the confinement of the crystal, and the possibility of engineering the soft water/oil interface. We describe the nucleation behavior of model inorganic crystals. An aqueous microdroplet of a crystallizable polytypic inorganic solute surrounded by a dewatering oil can be driven to supersaturation by water transport from the droplet, and polymorph control can be achieved depending on amphiphile structure. We also demonstrate the propensity of specific anions to disrupt the crystal templating ability of the monolayer, with a trend that follows a Hofmeister series. Finally, we have attained ultra-rapid droplet crystal nucleation in a system that employs a droplet interface bilayer for membrane crystallization.

Dr. Sunghee Lee has been on the Chemistry faculty at Iona College, New Rochelle, NY since 2004 and has been chair of the department since 2010. Previously she had taught in the Science Department at Bergen Community College (Paramus, NJ). She received her B.S. and M.S. degrees from Sung Kyun Kwan University and Pohang University of Science and Technology, respectively, both in South Korea, and her Ph.D. from Brown University in Providence, RI (Best Ph.D. Thesis-Potter Award in Chemistry). She also held post-doctoral positions at Texas A&M University (College Station, TX) and at Duke University (Durham, NC). Much of her current research is focused on understanding how surfactant monolayers at water-oil interfaces are capable of templating the formation of inorganic crystals. Further, she has a strong emphasis on involving undergraduates in research. She has more than 20 peer-reviewed publications, and at least 70 conference papers and presentations. Many of these include undergraduate co-authors. She has also contributed a chapter to a book and holds two U.S. patents. In addition to the Potter Prize, noted above, she has won three Iona College awards (Dean of Arts and Science Award, Presidential Teaching Scholar, Honors Program Teacher/Advisor of the Year Award), and the ACS Women Chemists Committee Rising Star Award. Dr. Lee's research has been funded by NSF, ACS – Petroleum Research Fund, Dreyfus Foundation, and Patrick J. Martin Foundation.

**Date:** Wednesday, May 1, 2013

Times: Social 5:00 PM

Lecture and Awards 6:00 PM

Dinner 7:00 PM

Place: Pace University

861 Bedford Road – Entrance #2,  
The Campus Center, Butcher Suite  
Pleasantville, NY 10570

Cost: Students \$20

All Others \$30

RSVP Required – [pwrc@earthlink.com](mailto:pwrc@earthlink.com)

For more information, contact Paul Dillon:

E-Mail [PaulWDillon2@hotmail.com](mailto:PaulWDillon2@hotmail.com)

Phone (914)393-6940

For Pace University information:

[eweiser@pace.edu](mailto:eweiser@pace.edu)

Westchester Chemical Society Webpage:

[http://www.newyorkacs.org/sub\\_west.php](http://www.newyorkacs.org/sub_west.php)

## BROOKLYN SUBSECTION

### Brooklyn College H. Martin Friedman Lecture — “Manipulating Quorum Sensing to Control Bacterial Pathogenicity”

*Speaker:* Bonnie L. Bassler  
Squibb Professor in Molecular  
Biology  
Princeton University



Bacteria communicate with one another via the production and detection of secreted signal molecules called auto-inducers. This cell-to-cell communication process, called “Quorum Sensing”, allows bacteria to syn-

chronize behavior on a population-wide scale. Behaviors controlled by quorum sensing are usually ones that are unproductive when undertaken by an individual bacterium acting alone but become effective when undertaken in unison by the group. For example, quorum sensing controls virulence, biofilm formation, sporulation, and the exchange of DNA. Thus, quorum sensing is a mechanism that allows bacteria to function as multi-cellular organisms. Gram-negative bacteria use acyl-homoserine lactone (AHL) autoinducers, which are detected by one of two receptor types, cytoplasmic LuxR-type receptors or membrane-bound LuxN-type receptors. We found small molecule antagonists of LuxN-type receptors that are also potent antagonists of LuxR-type receptors, despite differences in receptor structure, localization, AHL specificity, and signaling mechanism. Structural studies combined with mutagenesis allowed us to pinpoint the amino acid residues in the receptors that are critical for conferring agonist and antagonist activity to different ligands. Our most potent quorum-sensing antagonist protects animals from quorum-sensing-mediated killing by pathogenic bacteria and prevents biofilm formation in model microfluidics chambers that mimic medical devices. These results validate the notion that targeting quorum sensing has potential for antimicrobial drug development.

**Date:** Thursday, May 2, 2013

**Time:** 12:30 PM

**Place:** 2310 Ingersoll Hall  
Brooklyn College  
2900 Bedford Avenue  
Brooklyn, NY

## ACS NY SECTION—61st ANNUAL UNDERGRADUATE RESEARCH SYMPOSIUM (URS) AND GRADUATE FAIR

### Research Adventures in Molecular Biophysics: fungal, vegetable and animal tales

*Keynote Speaker:*

Prof. Ruth Stark  
Dept. of Chemistry  
City University of  
New York (CUNY)



Ruth Stark received her A.B. degree in Chemistry at Cornell University and her Ph.D. in Physical Chemistry at the University of California, San Diego. A faculty member at the City University of New York

(CUNY) since 1985, Dr. Stark was designated as Distinguished Professor in 2006 and has been honored as a Fellow of the American Association for the Advancement of Science and with New York City’s Sloan Public Service Award. Currently, she directs the 8-campus CUNY Institute for Macromolecular Assemblies and leads a 13-person City College research team who span high school through senior postdoctoral levels. Drawing on training at the interface of chemistry, physics, and biology, her current research program focuses on the molecular structure and development of biopolymers that protect fruits and vegetables, the solution-state structure and signaling mechanisms of nutritionally important fatty acid-binding proteins, and the molecular development of melanin pigments associated with virulence and drug resistance of human fungal pathogens.

From cellular signaling networks that regulate human development to environmentally responsive surface composites that control plant integrity, spatial and temporal interactions among large assemblies of biological macromolecules rule the roost. To examine the molecular composition and architecture of these assemblies at atomic or near-atomic resolution; we use technologies that include molecular biology, chromatography, magnetic resonance spectroscopy, surface microscopy, and computational modeling. Examples of ongoing research will focus on three biological targets: melanin pigments associated with microbial virulence and drug resistance; plant polymers that offer mechanical support and protection from dehydration; fatty acid-binding proteins involved in lipid metabolism in health and disease.

The Keynote Address will be followed by original research presentations given by students

from colleges and universities throughout the tri-state area.

**Date:** Saturday, April 27, 2013.

**Times:** 8:00 AM - 3:00 PM  
(breakfast, luncheon and award reception included)

**Place:** CUNY City College of New York  
New York, NY

Sign up as an attendee at <http://www.newyorkacs.org/meetings/urs/urs.php>

E-mail questions to:  
[nyacsurs2013@gmail.com](mailto:nyacsurs2013@gmail.com)

FREE Registration for student members of the National ACS, faculty mentors who register in advance and sponsors. For non-ACS members and guests, the registration is \$35 in advance. All on-site registration is \$45 for faculty, staff and guests. Checks for the registration fee should be made out to: "NY ACS URS" and sent to: Prof. Joseph Serafin, St. John's University, Department of Chemistry, 333 St. Albert Hall, Queens, NY 11439.



## EMPLOYMENT AND PROFESSIONAL RELATIONS COMMITTEE OF THE NEW YORK SECTION

### To Human Resources Departments in Industry and Academia

The Employment and Professional Relations Committee maintains a roster of candidates who are ACS members seeking a position in the New York metropolitan area. If you have job openings and would like qualified candidates to contact you, please send a brief job description and educational/experience background required to [hessytaft@hotmail.com](mailto:hessytaft@hotmail.com).

Candidates from our roster who meet the requirements you describe will be asked to contact you.



## NEW YORK ELECTION

### Thank You, New York Section Members!!

The NY Section switched to electronic balloting last year and you, our members, increased the voting rate from 10% to 15% of the membership. This year we hope to do better.

Prior to the election we will send three e-mail messages asking if you want to receive a paper ballot this year. Please respond ONLY IF YOU WANT A PAPER BALLOT. Otherwise, you will receive an electronic ballot in mid-April with a deadline of May 31. Two voting reminders will also be sent.

Thank you, in advance, for voting in the 2013 New York Section elections.

## ADELPHI UNIVERSITY

### 2013 Henry Drysdale Dakin Memorial Lecture — "From Basic Research to Advanced Antibiotics"

**Speaker:** Professor Ada E. Yonath  
The Martin S. and Helen Kimmel Professor of Structural Biology Director, The Helen and Milton A. Kimmelman Center for Biomolecular Structure and Assembly  
Weizmann Institute of Science  
Rehovot, Israel  
2009 Nobel Laureate in Chemistry



Ribosomes are the universal cellular apparatuses that translate the genetic code into proteins. Composed of proteins and RNA, among which the RNA moieties perform almost all functional tasks, they possess spectacular architecture accompanied by inherent mobility that facilitate their smooth and efficient performance. The stunning level of conservation of a pocket-like region containing the site for peptide bond formation hints that a remnant of a prebiotic bonding entity is functioning in the contemporary ribosomes.

Owing to their fundamental role, ribosomes are targeted by many antibiotics, each paralyzing the ribosomes by binding to a specific functional site. Their binding modes, inhibitory action and synergism pathways have been elucidated. The mechanisms leading to bacterial resistance to ribosomal antibiotics and issues concerning the ways towards combating the resistance will be discussed.

**Date:** Monday, April 29, 2013

**Time:** 7:00 PM

**Place:** Thomas Dixon Lovely Ballroom  
University Center  
Adelphi University

**Cost:** Free and open to the public

**Travel Directions:** <http://www.adelphi.edu/visitors/directions.php>

**Additional Information:** Contact Professor Stephen Z. Goldberg, (516) 877-4147 or [goldberg@adelphi.edu](mailto:goldberg@adelphi.edu)

## 2013 SECTIONWIDE CONFERENCE, ST. JOHN'S UNIVERSITY

The annual Section-wide conference of the New York Section was held on February 2 at St. John's University. Dr. Philip Mark, Professor Emeritus at Nassau Community College - SUNY and 2013 New York Section Chair, hosted the event. The conference began with a continental breakfast for all attendees. Dr. Mark welcomed the guests and acknowledged the various colleges that had attendees present. The Section-wide conference included the presentation of awards for volunteerism and achievement, the presentation of the candidates for the 2013 elections in April and then an entertaining keynote address by Dr. Alfredo Mellace, of Nassau Community College, SUNY. Committee members then gathered to plan activities for 2013, followed by lunch at Acquista Trattoria.

At the award ceremony, Dr. JaimeLee I. Rizzo of Pace University NYC received the ACS plaque, past chair pin, and a flower arrangement in appreciation of her excellent work as Chair of the New York Section in 2012. The 2012 Outstanding Service Award was given to Dr. Stephen Goldberg of Adelphi University. Dr. Goldberg is a dedicated coordinator of the Chemistry Olympiad Program and former Treasurer of the Section. He is also active in the Long Island Subsection. The Section presented the Nichols Foundation High School Chemistry Teacher Award for 2012 to Dr. Steven O'Malley of Stuyvesant High School in Manhattan. Mr.

Stephen Radice introduced Dr. O'Malley and described his many accomplishments as an outstanding teacher of chemistry. Mr. Radice, himself, is a former Nichols Teacher awardee, and will be honored with the James Bryant Conant Award at the National ACS meeting in April in New Orleans.

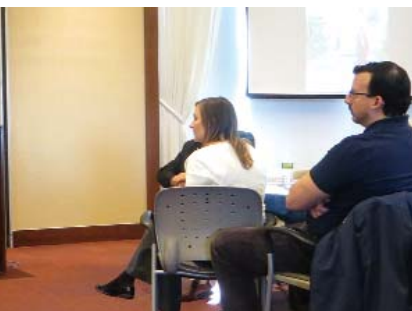
After the awards, Dr. Pamela Kerrigan of College of Mount Saint Vincent, 2013 Chair-elect of the New York Section, presented the names of the candidates for the upcoming 2013 elections and introduced those candidates who were present.

Dr. Alfredo Mellace's talk was on "Ancient Roman Science and Technology." Rome was placed in the context of the ancient world, with respect to its achievements in technology, specifically military equipment that influenced the way the Roman engineers, smiths, textile manufacturers, leather workers, and artisans designed items and objects. The presentation included the science and technology behind the metallurgy, dye processes, armor production, leatherwork, carpentry, masonry, and siege machine. The audience was very impressed with the beautiful items collected and duplicated by Dr. Mellace, and with the passion he has for this field of study.

The last hour of the conference is devoted to a planning session for subsections, topical groups, and committees and it concludes with reports from the chairs of each of the groups. The traditional luncheon with colleagues was enjoyed by many at Acquista Trattoria. The conference is always a great socializing and networking experience.



**Dr. Alfredo Mellace displays items of Roman military design and function.**





Dr. Philip Mark welcoming attendees to the annual Sectionwide Conference.



Dr. Jaime I. Rizzo is presented with a plaque of appreciation and the pastchair pin for her dedication to the office of Chair of the New York Section for 2012.

*(Photos courtesy of Marilyn Jespersen)*



Dr. Stephen Goldberg (left) accepting the Outstanding Service Award from Dr. Philip Mark.



Dr. Steven O'Malley (left) accepting the Nichols Foundation Teacher Award from Mr. Stephen Radice (right). 2013 Chair Dr. Philip Mark at center.

## NY SLATE OF CANDIDATES

At the January Section-wide Conference, the Nominating Committee presented the candidates for office for the 2013 elections. The biographies of the candidates can be found on the New York Section website at <http://www.NewYorkACS.org>. The Board of Directors extends a sincere thank you to the following candidates for accepting the nomination to run for office, and sincerely encourages ACS New York Section members to vote.

Electronic ballots will be sent to the membership in mid-April and voting will be conducted according to ACS guidelines for confidentiality and security. Members requesting paper ballots will receive them by May 1, 2013. If a member does not receive voting materials by then, please contact the New York Section Office at (516) 883-7510 or [njesper1optonline.net](mailto:njesper1optonline.net).

### Chair Elect for 2014

George Rodriguez (Argeni LLC)  
Paris Svoronos (Queensborough CC CUNY)

### Treasurer for 2014 and 2015

Robert P. Nolan (International Environmental Research Foundation)

### Director at Large for 2014

Daniel Amarante (Coll. of Mount St. Vincent)  
Theresa R. Cea (Retired/Kraft)  
Steven J. Chaterpaul (Bard HS Early Coll.)  
Gina M. Florio (St. John's University)  
Rolande R. Hodel (AIDSfreeAFRICA)  
Luis Vargas (Nassau CC SUNY)

### Councilor for 2014-2016

Richard D. Cassetta (Retired, Emeritus, College of New Rochelle)  
Donald D. Clarke (Fordham University)  
Jean D. Delfiner (Retired, NYC Dept. of Ed.)  
Neil D. Jespersen (St. John's University)  
Patricia A. Redden (St. Peter's College)  
Frank R. Romano (Agilent Technologies)

## WESTCHESTER CHEMICAL SOCIETY

On February 7, 2013 Christopher Salnave, M.S., an adjunct lecturer at Saint John's University in Queens, N.Y. made an interesting and informative presentation to the Westchester Chemical Society on an imaging technique called FIONA (Fluorescence Imaging with One Nanometer Accuracy). FIONA is a method that shatters the diffraction limit of light and has revolutionized the field of fluorescence microscopy and biophotonics over the last decade. Mr. Salnave described how combining methods of FIONA and total internal reflection microscopy (TIRFM) has allowed determination of detailed molecular motor mechanisms with nanometer precision *in vitro* and *in vivo*. His presentation included real-time videos of moving individual biological macromolecules. One of his projects focuses on Myosin VI, an actin based molecular motor that has been known to be involved in cell migration (including tumor metastasis), spermatogenesis, signal transduction, and the process of intracellular organelle and vesicle transport. It also assists with the stabilization of stereocilia, the mechanosensing organelles in hair cells in the inner ear. Myosin VI is considered to be an unconventional myosin, because to carry out these physiological processes it moves toward the pointed end of the actin cytoskeleton; in contrast to other characterized myosins. Mr. Salnave described tracking Myosin VI *in*

*in vivo* using FIONA and TIRFM by utilizing fluorescent labeled endosomes. There was lively discussion during and after the talk, which was held at the Westchester Community College in Valhalla, N.Y. A smaller group continued the discussion at dinner later in the evening. All of us had an enjoyable, interesting and informative evening. The photo below is of Mr. Salnave and the WCS board members attending the meeting.



## DR. STEVEN O'MALLEY – NICHOLS FOUNDATION HIGH SCHOOL CHEMISTRY TEACHER AWARD

Dr. Steven O'Malley of Stuyvesant High School in New York City is the recipient of the 2012 Nichols Foundation High School Chemistry Teacher Award. Dr. O'Malley accepted the award at the New York Section's General Meeting and Sectionwide Conference held on February 2 at St. John's University, Jamaica, NY. The award is presented annually to recognize highly effective teaching and inspirational leadership to students in chemistry. The award was established in 1958 and consists of a plaque and \$1000. It is funded by the Nichols Foundation. Dr. Steven O'Malley exemplifies the qualities of a truly dedicated and extraordinary teacher.



Joan Laredo-Liddell, Peter Corfield, Christopher Salnave, Rolande Hodel, Jean Delfiner, Jody Reifenberg and Paul Dillon

*(Photo courtesy of Paul Dillon)*



Dr. O'Malley received a BS degree in chemical engineering from the University of Maryland, a PHD in Organic chemistry from Columbia University. He has also done post-doctoral work at Berkeley and holds an MS in teaching from Pace University.

Dr. O'Malley is presently teaching at Stuyvesant High School in Manhattan. Stuyvesant is a public high school that specializes in the sciences. The school's population is about 3,200. His teaching load has included Advanced Placement chemistry, Regents chemistry, Organic chemistry, and Research chemistry.

Dr. O, as his students call him, (which is an appropriate name for an organic chemistry teacher) uses effective techniques to capture the interest of his students. He strongly believes in student centered learning. Walking into his classroom one will see students at the board racing to solve problems, students figuring out their own procedure to a lab or even a student made video shown (from personally mounted cameras) in the classroom presenting lessons to the students. He considers himself more of a facilitator than a teacher.

Dr. O'Malley has an excellent website where students can access their worksheets, labs, and even a running list of videos of chemistry demonstrations.

Dr. O'Malley challenges and inspires students in many ways. In his Aspirin synthesis lab students are graded on the purity of the aspirin.

This forces students to have a greater sense of purpose and work carefully.

Dr. O'Malley takes his students to visit Columbia University to join 100 undergraduates in their organic chemistry class, and to visit Merck Pharmaceuticals where students are treated to presentations about medicinal chemistry and tours of the labs. Here the students interact with real chemists who learn, present and employ the very subject of the classroom.

Scott Thomas, Assistant Principal of Supervision for the Chemistry and Physics Department writes: "Steven is a talented teacher who has shown great dedication and commitment to his instructional practice. He has also gained a great deal of respect from his students and his fellow teachers and has demonstrated a natural ability to present chemistry in a meaningful way. He has been a true inspirational leader in the Chemistry Department at Stuyvesant High School.

One of Dr. O'Malley's former students writes: "My fantastic experience in his class was the reason I took organic chemistry... It was his excited and supportive teaching that made an incredibly demanding course stimulating and fun... he gracefully illustrated the fact that chemistry can be viewed as a puzzle and an art."

Congratulations Steven!!!!!!

Written by Stephen Radice: Chair, Nichols Teacher Award Committee



**Mr. Stephen Radice, Chair of the Nichols Teacher Award Jury, and Dr. Steven O'Malley, Winner of the 2012 Nichols Foundation Chemistry Teacher Award**

*(Photo courtesy of Marilyn Jespersen)*

## North Jersey Meetings

<http://www.njacs.org>

### NORTH JERSEY EXECUTIVE COMMITTEE MEETING

The April NJACS Executive Committee meeting will be held on the Seton Hall University Campus.

Section officers, councilors, committee chairs, topical group chairs, and section event organizers meet regularly at the Executive Committee Meeting to discuss topics of importance to running the section and representing the membership. All ACS members are welcome to attend this meeting and to become more involved in section activities.

**Date:** Monday, April 29, 2013

**Time:** Pizza and drinks 6:00 PM  
Executive Meeting 6:30 - 8:00 PM

**Place:** Seton Hall University  
Jubilee Hall, Room 132  
400 South Orange Avenue  
South Orange, NJ

**Cost:** \$5.00 payable at the meeting

Directions and a Campus Map are available at: <http://www.shu.edu/visiting/campus-map.cfm>



### CAREERS IN TRANSITION MEETINGS

#### Job Hunting??

We offer assistance at Students2Science to help members with their job search on the second Monday of each month. Topics at this free workshop are:

- Techniques to enhance resume effectiveness
- Interview practice along with responding to difficult questions
- Networking to find hidden jobs
- Planning a more effective job search

**Date:** Monday, April 8, 2013

**Times:** Meeting 5:30 - 9:00 PM  
Pizza snack and soda 6:30 PM

**Place:** Students 2 Science, Inc.  
66 Deforest Avenue  
East Hanover, NJ

**Cost:** \$5.00 for pizza and soda

Reservations: at  
[www.njacs.org/careers.html](http://www.njacs.org/careers.html)

A job board and networking assistance is offered at most topical group meetings. Appointments with Bill can be arranged for personal assistance at (908) 875-9069 or [billsuits@earthlink.net](mailto:billsuits@earthlink.net).

See [www.njacs.org](http://www.njacs.org) under the Career tab for Jobs hidden from sight and relevant blogs.



### NORTH JERSEY TEACHER AFFILIATES

**Date:** Wednesday, April 10, 2013

**Time:** 4:00 PM

**Place:** College of St. Elizabeth  
Convent Station, NJ



### METRO WOMEN CHEMISTS COMMITTEE

#### Gift of Mentoring Award

The Metro Women Chemist Committee is holding the 4th annual Gift of Mentoring Award Ceremony. The evening will include a speaker and a panel discussing the importance of mentoring, from the perspectives of both mentors and students.

**Date:** Thursday, April 18, 2013

**Time:** The event will start at 6:00 PM and include dinner.

**Place:** Farleigh Dickinson University  
Hartman Lounge  
Madison, NJ

**Cost:** \$20 (\$10 for unemployed/students). Feel free to bring a bottle of wine. Also, please feel free to pass this announcement on to your colleagues and friends. (Several email addresses on our mailing list no longer exist.)

Directions to the FDU campus can be found on their website:

<http://view.fdu.edu/default.aspx?id=238>

For Further details as the event approaches please check our website (<http://njacs.org/metrowomen.html>) or email Sarah Carberry ([sbolton@ramapo.edu](mailto:sbolton@ramapo.edu)).

## NoJ SECTION'S 65th ANNUAL UNDERGRADUATE RESEARCH CONFERENCE

The Sixty-Fifth Annual Undergraduate Research Conference provides an opportunity for talented undergraduate students in the North Jersey Section to give an oral presentation on their research results. All undergraduate students in the North Jersey Section are invited to participate in this very rewarding event. The research presentations will be judged by local chemists working in industry or academia and the student giving the best presentation will be given the 2013 Jean Asell Duranna Award. In addition the top three presenters will be awarded cash prizes. The student award winners and their advisors will then be invited to attend the North Jersey Section's Annual Awards Dinner held on **Tuesday, May 14, 2013** in Lenfell Hall on the Fairleigh Dickinson University campus in Madison, NJ.

**Abstract Information:** Clearly indicate the title of the presentation and all authors. Abstracts must be no more than 200 words and need to be submitted as a word document attached to an email to Jefferson Tilley. For more information about this event or to submit an abstract, contact Jefferson Tilley, Chair North Jersey Section ACS, [tilleyjk@bendbroadband.com](mailto:tilleyjk@bendbroadband.com). **Abstracts deadline is April 19, 2013.**

**Date:** Friday, April 26, 2013

**Times:** Noon until 5:00 PM

**Place:** Sokol Room, 102 Science Hall  
Montclair State University  
1 Normal Avenue, Montclair NJ



## METRO WOMEN CHEMISTS COMMITTEE

Despite the rainy cold weather The Metro Women Chemist Committee held its spring networking meeting on February 19th. The meeting was held at "Doin Dishes" in Montclair. The ladies who attended painted pottery, enjoyed wine and cheese, and networked. It was interesting to see the artistic side of the members, a few examples of the finished products (pre-fired) can be seen below. Our next meeting will be on April 18th. To receive more information about our group, future meetings, or to be added to the mailing list please contact the chair of the committee: Sarah Carberry at [sbolton@ramapo.edu](mailto:sbolton@ramapo.edu).



**MetroWomen Chemist "Doin Dishes" Projects at their February 19th meeting.**

*(Photo courtesy of Sarah Carberry)*

## Others

### NJIT – OTTO H. YORK DEPARTMENT OF CHEMICAL, BIOLOGICAL AND PHARMACEUTICAL ENGINEERING

#### Graduate Seminar Series — Spring 2013

*Sponsors:* Infineum USA L.P. and  
ConocoPhillips Bayway Refinery

#### April 1

"An Industry Perspective on Materials Characterization Techniques at the Molecular, Particulate and Bulk Level in Support of Pharmaceutical Product Manufacturing"

*Dr. Steven Conway*

Merck & Co., Inc.

Whitehouse Station, NJ

#### April 8

"Intermetallic Base-Metal Catalysts for Chemoselective Reactions: Viable Replacements for Monometallic and Bimetallic Precious Metal Catalysts"

*Professor Robert M. Rioux*

Friedrich G. Helfferrich Professor

Dept. of Chemical Engineering

The Pennsylvania State University

#### April 15

"Catalysis and the Nature of Mixed Metal Oxides at the Nanometer Level"

*Dr. Dario J. Stacchiola*

*(continued on page 20)*

**NJIT***(continued from page 19)*

Dept. of Chemistry  
Brookhaven National Laboratory

**April 22**

"What Can a Materials Scientist Do to Improve Catalysts?"

*Dr. Guang Cao*

Section Head of the Catalytic Systems  
Section at the Corporate Strategic Research  
Labs

ExxonMobil Corp.

**April 29**

"Nanomaterials for Energy Devices"

*Professeur Laberty-Robert*

Polytech Paris Laboratoire de Chimie de la  
Matiere Condensee de Paris UPMC

**May 6**

"Nanoclusters of Boron and Gold"

*Professor Lai-Sheng Wang*

Dept. of Chemistry  
Brown University

OPEN TO PUBLIC

Times: Refreshments 2:30 PM  
Seminars 2:45 PM

Place: Room 117, Kupfrian Hall  
NJIT

Seminar Coordinator: Professor Reginald  
Tomkins, (973) 596-5656,  
[tomkinsr@njit.edu](mailto:tomkinsr@njit.edu)

**ACC&CE**

**Natural Gas Impact on US Economy:  
A Primer-Refresher**

*By John C. Bonacci*, PH D, PE, US Patent  
Agent—Certificate #821, President ACC&CE

At the end of 2012, we have a slowly recovering US economy (~2% annual GDP). Some say there could be a 6 month recession in 2013. This commentary addresses natural gas supply and specifically as a result of "fracking" in the Marcellus and other shale rock deposits. This is recent new technology (just a few years) and only getting more widely publicized in the past few months.

First though, we should recap a few decades of history. In the 70's natural gas was deregulated and more became available through standard production means. Much of this came to the East and Northeast area via two large pipelines from the Southwestern US.

Second, via the 1979 PURPA law (Public Utilities Regulatory Act), which said that private enterprises could use natural gas to fuel gas-fired cogeneration turbines to make steam and electricity? The Act only allowed central public utilities to own up to 50% of the entity and provided for the private user to sell back electricity to the utility at what was defined as the avoided cost. The PURPA law gave birth to a large private cogeneration industry and also became an adjunct of the central power plants. Thus an active cogeneration market developed for turbines and natural gas and also emission catalysts to remove CO and NOX. An indirect impact was the emissions reduction from oil and coal burning power plants due to the fuel switching.

Now, within the past decade and most specifically the past several years, the new drilling technology (called "hydrofracking" or just "fracking" frees up gas trapped in shale rock (in New York, Pennsylvania and West Virginia it is called the Marcellus shale). There is also shale rock out west (Bakken) and in the Southwest as well as certain global areas. For the US, reliable sources say we have 100 to 200 years of supply if all used internally. This is important because it will reduce oil imports and coal usage. Also a few years ago (5 or so) the US was contemplating and may have started building offshore terminals to IMPORT liquefied natural gas (LNG). Obviously this would decrease oil imports but not make us any more energy independent (maybe less dollar outflow to the

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Mideast). Currently the effort is being made to convert those LNG stations to export stations so we can sell LNG globally (a much better impact).

Let us now put into perspective briefly the energy and environmental aspects of natural gas vs. the other two fossil fuels, oil and coal. The environmental impact on climate change due to industrial CO<sub>2</sub> is a key factor. Coal has an approximate Carbon (C) and Hydrogen (H) chemical content of CH and oil has about CH<sub>2</sub> with natural gas at CO<sub>4</sub>, mainly methane. So when you burn these three fossil fuels on an equivalent energy or BTU basis, coal is the worst former of CO<sub>2</sub> (carbon dioxide) and oil is second worst and natural gas is the best. So the lowest "greenhouse" gas formation is the low CO<sub>2</sub> from burning natural gas. Depending on the impact on global warming which most climatologists believe to be from CO<sub>2</sub>, we have a significant benefit in the USA which together with China emits the most CO<sub>2</sub>.

On the direct economic side for these three fossil fuels we have the cost per BTU and natural gas again comes out the cheapest raw material with coal second and oil third. An explanation requires getting a little technical again. We refer to barrels of oil equivalent (BOE) for the cost comparison on just a raw material basis. A barrel of oil contains about 6 million BTU's and natural gas is currently selling around \$3.00 per million BTU's and has ranged from \$2.50 to \$5.00 over many years. Thus simple arithmetic shows that six of the \$5.00 per million BTU natural gas quantities is equivalent to one BOE. So natural gas is available now at between \$15 and \$30 per BOE. Oil is currently about \$95 per barrel and has ranged from \$80 to \$120 during the past two years. We note that all the new supplies of oil (Athabasca Sands from Canada and "tight" oil from the US Bakken) are all expensive. We don't see oil ever getting much below \$75 per barrel except in a global depression and even then not to the \$15 to \$30 level of a natural gas BOE. In the case of coal there is a significant range in BTU content requiring more detailed calculations but approximately half way between natural gas and oil on a \$/BOE basis. So we have a very significant raw material cost advantage with natural gas and it is also usually less expensive to process than either coal or oil.

The only logical conclusion is that we should switch our usage over to natural gas as fast as possible. It will be cheaper, more efficient and make the US independent of oil importing no matter where it comes from.

Getting back to other US economic factors, we know that natural gas is a key chemical manufacturing feedstock for fertilizer, methanol, and monomers to make polymers, textiles and

other petrochemical materials. So with lower raw material costs, lower energy costs and proximity to US markets, we should see a resurgence of manufacturing in the United States. It has already started with announced plans of DOW and others to build plants in the South-western US. Technology is also preeminent in the US and will contribute to lower labor costs, closer to those of other countries and thus further enhance manufacturing in the US.

I believe these basic industrial and technology factors to be so important that the US will return to past years eminence. Also these kinds of benefits are quite independent of our government actions but of course laws are always a factor to be considered. For example people say that the environmental factor is causing coal to be used less. I believe this is mainly a consequence of economics and coal usage has declined significantly in 2012 already mainly because of the low cost supply of natural gas and not because of any major change in environmental actions.



### **HARRY B. GRAY IS THE 2013 OTHMER GOLD WINNER**

Harry B. Gray, the Arnold O. Beckman Professor of Chemistry and the founding director of the Beckman Institute at the California Institute of Technology, will receive the 2013 Othmer Gold Medal at the Chemical Heritage Foundation on April 4. The Othmer Gold Medal presentation will be the premier event of CHF's 12th annual Heritage Day.

"Harry Gray is not just a much-heralded pioneer in bioinorganic chemistry," said Thomas R. Tritton, president and CEO of CHF. "In his sixth decade as a research leader with a global reputation, he is forming a Solar Army with no less ambition than reversing centuries of depleting energy from the earth and using the sun to create new and abundant energy to power the planet."



### **FRANK LAUKIEN TO ACCEPT 2013 PITTCOON HERITAGE AWARD FOR HIS FATHER, GUNTHER LAUKIEN**

The Chemical Heritage Foundation (CHF) will present the 2013 Pittcon Heritage Award in honor of Günther Laukien (1924–1997), the founder of the Bruker group of companies. Jointly sponsored by the Pittsburgh Conference on Analytical Chemistry and

*(continued on page 22)*

## GUNTHER LAUKIEN

(continued from page 21)

Applied Spectroscopy (Pittcon) and CHF, this award recognizes outstanding individuals whose entrepreneurial careers have shaped the scientific instrumentation community, inspired achievement, promoted public understanding of the modern instrumentation sciences, and highlighted the role of analytical chemistry in world economies. This 12th annual award will be presented at Pittcon 2013, which will be held in Philadelphia for the first time in its 64-year history.

Günther's son Frank Laukien, Ph.D., president and CEO of Bruker Corporation today, will receive the Pittcon Heritage Award in his father's honor at the 63th annual Pittcon, the world's annual premier conference and exposition on laboratory science.

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## Call for Nominations

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### WILLIAM H. NICHOLS MEDAL AWARD FOR 2014

The New York Section is accepting nominations for the William H. Nichols Medal Award for the year 2014. This distinguished award, established in 1902 by Dr. William H. Nichols, for the purpose of encouraging original research in chemistry, is the first award authorized by the American Chemical Society. It is presented annually in recognition of an outstanding contribution in the field of chemistry, and consists of a gold medal, a bronze replica and \$5000. The medals are presented at the William H. Nichols Meeting that consists of a Distinguished Symposium related to the medalist's field of expertise and a Medal Award Dinner.

Investigators who have published a significant and original contribution in any field of chem-

istry during the five calendar years preceding the presentation meeting are eligible for consideration by the Nichols Medal Jury. The New York Section encourages nominations from academia, government and industry.

Each nomination requires a completed nomination form, biographical and professional data, and seconding letters. Since the nomination process utilizes the New York Section website, please access the nomination form and instructions at <http://www.newyorkacs.org/meetings/Nominations/Nichols.php>

Nominations must be received by **May 31, 2013**. The Nichols Medal Award Jury will meet in June 2013 to select the Nichols Medalist for 2014.

Questions regarding the nomination procedure should be directed to the ACS, New York Section Office, at [njesper1@optonline.net](mailto:njesper1@optonline.net).



### EDWARD J. MERRILL AWARD FOR OUTSTANDING HIGH SCHOOL CHEMISTRY TEACHER FOR 2013

Now is the time to begin thinking about nominations for the Edward J. Merrill Award, North Jersey Section, for Outstanding High School Chemistry Teacher for the year 2013.

Go to the web site, [njacs.org](http://njacs.org) under education and obtain your preliminary nomination form and guidelines. The full packet takes time to do a good job!

We all know an outstanding high school chemistry teacher. Perhaps one from your town, your son's or daughter's teacher or just one that you have heard about or worked with at some point. The award carries \$500 for the teacher, \$500 in supplies for the teacher's classroom and a plaque to display at home or in the classroom.

Any questions or help needed contact Bettyann Howson, [chemphun@gmail.com](mailto:chemphun@gmail.com).



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## Press Releases

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### **SCIENCE OF HIRING: DEMAND FOR SCIENTISTS GROWS 15%**

**During January 2013, more than 68,000 jobs were advertised online for Scientists, a 15% year-over-year increase in demand, according to WANTED Analytics™.**

During January, more than 68,000 job ads were available online for Scientists, according to WANTED Analytics™ (<http://www.wantedanalytics.com>), the leading source of real-time business intelligence for the talent marketplace. As one of the STEM careers in the United States, there is high demand for science related professionals, yet there are often struggles with recruiting enough qualified talent due to competition and high barriers to entry. Despite a slowing in the last quarter of 2012, the number of science related job ads grew 15% in January compared to one year ago. In addition, hiring is up about 42% since the recession began four years ago.

Among the industries with the highest demand for scientists were pharmaceutical manufacturing, colleges and universities, conservation programs, life sciences research and development, and medical and surgical hospitals. In addition, the most commonly advertised science occupations are:

1. Research Analysts
2. Medical Scientists (except Epidemiologists)
3. Biological Technicians
4. Chemists
5. Environmental Science and Protection Technicians
6. Clinical Psychologists
7. Environmental Scientists
8. Geoscientists
9. Food Scientists and Technologists
10. Chemical Technicians

The five metropolitan areas with the highest volume of science job ads during January were New York, Boston, San Francisco, Los Angeles, and Washington (DC). Not only were the most job ads seen in the New York metro area, but they also experienced the highest year-over-year growth of these locations. Hiring demand grew 25% in January compared to January 2012. Washington, DC was close behind with a 24% increase, and

Los Angeles saw the third highest growth at 23%.

WANTED Technologies is the exclusive data provider for The Conference Board Help Wanted OnLine Data Series®, the monthly economic indicator of Hiring Demand in the United States.

The TSX Venture Exchange does not accept responsibility for the adequacy or accuracy of this release. Any statement that appears prospective shall not be interpreted as such.



### **ENGINEERING CELLS FOR MORE EFFICIENT BIOFUEL PRODUCTION**

**Yeast research takes a step toward production of alternatives to gasoline.**

CAMBRIDGE, Mass. — In the search for renewable alternatives to gasoline, heavy alcohols such as isobutanol are promising candidates. Not only do they contain more energy than ethanol, but they are also more compatible with existing gasoline-based infrastructure. For isobutanol to become practical, however, scientists need a way to reliably produce huge quantities of it from renewable sources.

MIT chemical engineers and biologists have now devised a way to dramatically boost isobutanol production in yeast, which naturally make it in small amounts. They engineered yeast so that isobutanol synthesis takes place entirely within mitochondria, cell structures that generate energy and also host many biosynthetic pathways. Using this approach, they were able to boost isobutanol production by about 260 percent.

Though still short of the scale needed for industrial production, the advance suggests that this is a promising approach to engineering not only isobutanol but other useful chemicals as well, says Gregory Stephanopoulos, an MIT professor of chemical engineering and one of the senior authors of a paper describing the work in the Feb. 17 online edition of *Nature Biotechnology*.

The research was funded by the National Institutes of Health and Shell Global Solutions.

<http://web.mit.edu/press/2013/yeast-research-may-boost-biofuel-production-efficiency.html>

Written by Anne Trafton, MIT News Office

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## Ad Index

### ANALYTICAL

EuTech Scientific Servies	9
Huffman Laboratories, Inc.	24
Micron Inc.	22
New Jersey Institute of Technology	24
NuMega Resonance Labs.	24
Robertson Microlit Labs	4

### EDUCATION

Illinois Institute of Technology	20
----------------------------------	----

### EQUIPMENT

Eastern Scientific Co.	6
Mass Vac, Inc.	2

### GENERAL

ACS-NY/NoJ Sections	8
ACS-NY/NoJ Sections	24
ACS-NY/NoJ Sections	24