

# The Crucible



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Volume: XCVI No.8

April 2011

## The Spectroscopy Society of Pittsburgh Celebrates its 65<sup>th</sup> Anniversary

The Spectroscopy Society of Pittsburgh (SSP) is celebrating its 65<sup>th</sup> anniversary during 2011, The International Year of Chemistry. As part of this celebration, the SSP has dedicated this year to the former Chairmen of the Society; recognizing their efforts in developing programs and activities over 65 years for the promotion of science education. To this end, the SSP is committed to educating members of the scientific community, students, and teachers about spectroscopy and science. With this as their goal, the SSP holds monthly technical meetings, develops and presents seminars and workshops, awards scholarships, grants and endowments and financially supports science related community activities.



*Mary Elizabeth Warga, first Chairman, of the Spectroscopy Society of Pittsburgh.*

The first chairman of the SSP was Dr. Mary Elizabeth Warga, 1946 to 1947. Mary was born in Donora, PA, and her advanced education was received at the University of Pittsburgh. Dr. Warga spent the early part of her professional career at the Mellon Institute of Industrial Research, Pittsburgh, PA, from 1929 to 1936. She joined the University of Pittsburgh Physics Department in 1936 and remained there as a faculty member until 1959. Mary developed the spectroscopy lab-

oratory at the University; her research interest was emission spectrochemical analysis. She was also instrumental in establishing the SSP and became the Society's first Chairman. Mary, at the age of 87, died on December 10, 1991. The people who worked with Dr. Warga knew her as a dedicated and talented educator; Mary's strong contribution to the Pittsburgh scientific community will forever be remembered.

Also, in celebration of the 65<sup>th</sup> anniversary of the Spectroscopy Society of Pittsburgh, a commemorative poster has been designed and printed. The poster features a photograph of a classic, early twentieth century type, Bunsen-Kirchhoff spectroscope. It is being made available to interested individuals and while the supply lasts, you can obtain a copy simply by directing your request to [www.ssp-pgh.org](http://www.ssp-pgh.org) or by calling (412) 825-3220, extension 212.

**HAPPY 65<sup>TH</sup>  
ANNIVERSARY SSP!**

*Article Submitted by: Bob Witkowski,  
SSP Publicity Chair*

### Pittsburgh Section ACS

#### Section's Website:

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Chairman & CEO,  
Rockwood Holdings



**Peter Young**  
President,  
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**Craig Rogerson**  
CEO,  
Chemtura Corporation



**Guy Villax,**  
CEO,  
Hovione



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VP, Global R&D,  
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*I must say that your Symposium line up will make Chemspec USA the BEST meeting in the States to attend! I am really impressed*

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### PERFECT LOCATION

**Philadelphia** is at the heart of the US custom chemicals industry (Pennsylvania, New Jersey and adjacent states) and is also a major hub of the whole life science sector. Over 60% of SOCMA members are within 100 miles and over 27% of ACS members are within the same distance of the city. Philadelphia is one of the top three centers for biotechnology in the US.

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AMPAC Fine Chemicals • Brenntag • Lonza • Chemtura • Chemetall • Hovione • Sumitomo • Davos • Daikin • Almac Sciences • Dishman • Ash Stevens • TCI America • Kaneka • Spectrum • Isochem NA • Notox • Halocarbon and Bio organizations from key US states in close proximity to the event site

### RX-360 SEMINAR

THURSDAY MAY 4 2011

Rx-360 is an international consortium of pharmaceutical and biotech companies and suppliers to the industry, that aims to develop and implement a global quality system to help members ensure product quality and authenticity throughout their supply chain to enhance patient safety.

### AGENDA AT A GLANCE

SUNDAY MAY 1 - THURSDAY MAY 5

Starting Sunday, May 1: American Chemical Society Short Courses  
Monday, May 2: Scholarship Golf Day  
Tuesday, May 3: Symposium Day  
Wednesday, May 4 - Thursday, May 5:  
Exhibition & Exhibitor Showcases

### MORE INFORMATION

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# Mass Spectrometry Discussion Group of Pittsburgh



Thursday, April 14, 2010

## **ROUNDTABLE DISCUSSION: CURRENT ISSUES & OPPORTUNITIES IN MS BASED BIOMARKER DISCOVERY**

*Sponsored by the Spectroscopy Society of Pittsburgh and Open to the Public*

### **Grand Concourse – Ladies' Waiting Room**

100 West Station Square Drive, Pittsburgh PA 15219

\*Must park in Station Square East Lot for free parking

### **PROGRAM**

5:30 P.M. Social Hour (Cash Bar) and Registration

6:00 P.M. Dinner

7:00 P.M. **Roundtable Discussion**

**Experts:** William L. Bigbee, University of Pittsburgh Cancer Institute

Russell Grant, Lab Corps

Fred Regnier, Purdue University

Haleem Issaq, National Cancer Institute

**Moderator:** Scott Kuzdzal, Shimadzu Scientific Instruments

9:00 P.M. Conclusion

Registration Fee: \$15 (\$5 for Student and Retiree) – Dinner & Parking Included

Please make check payable to SSP and mail the form below by April 7 to:

Heather Juzwa

SSP – Continuing Education Symposium

321 Winners Circle

Canonsburg, PA 15317

For more information, visit the MSDG website at <http://chemed.chem.pitt.edu/ssp-msdg/>

or contact Heather Juzwa by email at [hljuzwa@shimadzu.com](mailto:hljuzwa@shimadzu.com).

Please tell Heather if you want a vegetarian meal.

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### SSP Continuing Education Registration Form – April 14, 2010

Name: \_\_\_\_\_ Affiliation: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Email: \_\_\_\_\_ Phone: \_\_\_\_\_



# Spectroscopy Society of Pittsburgh



## Presents a Continuing Education Symposium:

### “Financial Planning in a Global Economy”

Saturday, May 7, 2011

8:45 am – 1:00 pm

Pittsburgh Athletic Association – 2<sup>nd</sup> Floor Library  
4215 Fifth Avenue, Pittsburgh, PA 15213

#### PROGRAM

8:45-9:15	Registration
9:15-10:30	Jayne Meredith, Vice-President and Financial Advisor
10:30-10:45	Break
10:45-11:30	Matthew Snider, Vice-President and Financial Advisor
11:30-12:00	Question and Answer Session
12:00	Lunch

#### OPEN TO THE PUBLIC

Please register by April 27, 2011

#### Topics Include:

- |  |  |
|--|--|
| •What to ask and what you should be able to answer | •Basics of portfolio construction          |
| •How to keep on track to meet goals                | •How to determine financial goals          |
| •Risks and how to handle them                      | •Diversification and its importance        |
| •How to choose a financial professional            | •Current economic and investment outlook   |
| •Common mistakes                                   | •Types of investment accounts and vehicles |

Registration Fee: \$10 (\$5 for Student and Retiree) - Lunch & Parking\* Included  
(\*Soldiers and Sailors lot)

Please make check payable to SSP and mail the Registration Form below to:

Jenna Sabot  
SSP – Continuing Education  
300 Penn Center Blvd, Suite 332  
Pittsburgh, PA 15235

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### SACP Continuing Education Registration Form - May 7, 2011

Name: \_\_\_\_\_ Affiliation: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Email: \_\_\_\_\_ Phone: \_\_\_\_\_

Indicate Meal Choice:    Traditional Club       Jumbo Fish Sandwich       Grilled Vegetable Sandwich



# Society for Analytical Chemists of Pittsburgh



## April Meeting

Monday, April 4, 2011

8:00 PM

Duquesne University, Laura Faulk Hall

## “New Analytical Chemistry and the Fight Against Performance-Enhancing Drugs in Sport”

**Larry Bowers, Ph.D.**

Chief Science Officer, The US Anti-Doping Agency

The use of performance-enhancing substances in sport is believed to date back to the Greeks and the original Olympic Games. Beginning in the early 1900's, stimulants such as amphetamine, cocaine, heroin, and strychnine were widely used in multi-day endurance running, cycling, and swimming events. Deaths among athletes prompted initial bans on the use of stimulants in 1928. Anabolic steroids were introduced to sport in the 1950's through 1980's. Recombinant DNA-based protein pharmaceutical agents like erythropoietin (EPO) and growth hormone (GH) emerged in the 1980's and 1990's, as did their abuse.

In 2000, responsibility for overseeing the global fight against the use of performance-enhancing drugs was transferred to the World Anti-Doping Agency (WADA; [www.wada-ama.org](http://www.wada-ama.org)), a joint effort of sport bodies and governments. WADA is responsible for determining the List of Prohibited Substances, accreditation of 34 testing laboratories around the world, and evaluating signatory compliance with the World Anti-Doping Code. The purpose of anti-doping programs is to achieve “perceived deterrence”. The perceived deterrence model requires that the individual be more concerned about the consequences of being caught and sanctioned than they are with the benefits of violating the rules of sport. This places significant emphasis on the collection of appropriately timed samples and the capabilities of the analytical methods available for the detection of prohibited substances.

Chromatographic methods with mass spectrometric detection (GC-MS; LC-MS-MS) have always been the core analytical techniques used because of the need to identify substances (and their metabolites) that should not be present in the athlete's urine or blood. The detection of substances that occur naturally in the body (e.g., testosterone, growth hormone) presents an even greater challenge. It is well known that most substances appearing in urine vary widely in concentrations, so measurement of concentration alone cannot be relied upon. The first means of detecting the use of testosterone was achieved by measuring the testosterone-to-epitestosterone ratio (T/E ratio). Initially the T/E ratio was compared to population reference ranges, but more recently intra-individual reference range assessment methods such as the personal reference range and “predictive” models have been used. Gas chromatography-combustion-isotope ratio mass spectrometry (GC-C-IRMS) has also been used to identify non-physiological sources of testosterone and other steroids.

It is clear from interviews with athletes who have confessed to their drug abuse and from other “intelligence” that athletes change their behaviors in response to changes in anti-doping strategies. Thus vigilance and continued analytical research funded by the anti-doping agencies such as the Partnership for Clean Competition ([www.cleancompetition.org](http://www.cleancompetition.org)) are key to maintaining deterrence.

**Biography:** Larry Donald Bowers received his Bachelor of Arts degree in Chemistry from Franklin and Marshall College, Lancaster, Pennsylvania. He completed his graduate work at the University of Georgia. His thesis work, under the direction of Professor Peter Carr, involved the preparation and application of immobilized enzymes to problems in bioanalysis. He was awarded a Ph.D. degree in Chemistry. Dr. Bowers then joined the Clinical Chemistry and Toxicology Division of the Department of Clinical Pathology at the University of Oregon Health Sciences Center in Portland, Oregon as a postdoctoral fellow. In September, 2000, Dr. Bowers joined the United States Anti-Doping Agency (USADA). He currently serves as Chief Science Officer.

**Dinner Reservations:** Please email the SACP Administrative Assistant, Valarie Daugherty at [daugherty@pittcon.org](mailto:daugherty@pittcon.org) by Wednesday, March 30, 2011 to make a dinner reservation. Should you not have email, please call 412-825-3220, ext 204. Dinner will cost \$8 (\$4 for students) and checks are to be made out to the SACP. If you have any dietary restrictions, please let Valarie know when you leave message.

**Parking:** Duquesne University Parking Garage entrance is on Forbes Avenue. Upon entering the garage, you will need to get a parking ticket and drive to upper floors. Bring your parking ticket to the dinner or meeting for a validation sticker. Contact Duquesne University if any difficulties arise.



# SPECTROSCOPY SOCIETY OF PITTSBURGH



Wednesday, April 20, 2011

Duquesne University - Pappert Hall (in the Bayer Learning Center)

8:15 PM - Technical Program

## *“Dynamic Nuclear Polarization NMR at High Magnetic Fields, Why Two Electrons Are Better Than One”*

**R. G. Griffin**

Francis Bitter Magnet Laboratory and Department of Chemistry, Massachusetts Institute of Technology

Nuclear magnetic resonance (NMR) is probably the most versatile analytical technique available to chemistry and biochemistry because it is non-perturbing and offers site-specific atomic resolution available with few other approaches. It is very forgiving as to the physical state of the sample, being applicable to gases, solutions and to amorphous and crystalline and microcrystalline solids. In addition, for similar reasons NMR (or MRI) is widely used in many other areas of science ranging from basic nuclear physics to medical imaging.

Despite its enormous versatility, the sensitivity of the NMR experiments is relatively low because it is based on observation of low energy spectroscopic transitions between nuclear Zeeman levels. As a consequence, there are continuing efforts to develop new NMR methods and instrumentation that improve the signal-to-noise of the experiments. Some of the most successful of these involve transfer experiments that move polarization from a highly polarized spin reservoir to a weakly polarized one, leading to an enhancement in the NMR signal intensities proportional to the ratio of the magnetic moments of the two spin species. It is now appreciated that the largest gains in signal intensities in these sorts of experiments can be achieved by transferring polarization from an electron spin(s) to a nuclear spin system. This is generally accomplished via microwave irradiation of the electron paramagnetic resonance (EPR) spectrum, an experiment known as dynamic nuclear polarization (DNP) NMR. Since contemporary NMR experiments are performed at magnetic fields of ~5-23 T, the required microwave radiation falls into the frequency range 140-660 GHz, or the millimeter wave regime. This presentation discusses the implementation of DNP/NMR experiments in high magnetic fields.

Over the last few years we have developed cyclotron resonance maser (a.k.a. gyrotron) microwave sources that operate at frequencies of 140-460 GHz that permit DNP enhanced NMR (DNP/NMR) experiments in magnetic fields of 5-16.4 T (1H NMR frequencies of 211-700 MHz, respectively). We review the instrumentation used for these experiments, which include new NMR probe designs and tunable gyrotron sources. In addition, we discuss two mechanisms that are currently used for DNP experiments in solids at high fields – the solid effect and cross effect -- and the polarizing agents appropriate for each. These include biradicals that enable increased enhancements at reduced concentrations of the paramagnetic center. Figure 1 depicts recent results obtained from the rigid biradical bis-TEMPO-bis-ketal (bTbk) where we observe an enhancement of ~250, or a reduction in signal averaging time of 62,500. In addition, we discuss applications of DNP/NMR that illustrate its utility in enhancing signal-to-noise in MAS NMR spectra of a variety of biological systems including membrane and amyloid proteins whose structures are of considerable scientific interest. Presently, enhancements that are routinely available and range from 40-250 depending on experimental variables such as temperature, magnetic field, microwave B1, polarizing agent, etc. Finally, we describe extensions of these experiments that permit observation of <sup>13</sup>C liquid state spectra where we have observed enhancements of 140-400 in small molecules and a protein.

**Bio:** Prof. Robert G. Griffin received his B.S. degree (with Honors) in 1964 majoring in Chemistry at the University of Arkansas. He attended graduate school at Washington University (St. Louis, MO) where he worked with Prof. Samuel I. Weissman on EPR experiments directed at understanding the spectra and electron transfer processes of radical ions in solution. In 1970 after completing his Ph.D., he moved to MIT to perform postdoctoral work with Prof. John S. Waugh. At that time, the field of high resolution NMR in solids was in its infancy, and he was involved in multiple pulse NMR experiments that reported the initial observation of chemical shift anisotropies in single crystals and powders. In 1972 Prof. Griffin accepted a position at the Francis Bitter Magnet Laboratory (FBML) as a staff scientist, and rose through the ranks to become Director in 1992. In 1989, he joined the faculty of the MIT Chemistry Dept. where he teaches physical chemistry. In 2007 Professor Griffin received the Eastern Analytical Symposium Award for Outstanding Contributions to Magnetic Resonance and the Günther Laukien Prize of the Experimental Nuclear Magnetic Resonance Conference. In 2008 he was elected a Fellow of the International Society of Magnetic Resonance (ISMAR), and an honorary fellow of the NMR Society of India in 2009. In 2010 he received the ISMAR Triennial Prize for the development of high frequency dynamic nuclear polarization experiments.

**Dinner Reservations:** Please register on-line at <http://www.pittcon.org/misc/societies/ssprsvp.php> or call (412) 825-3220 ext 212 to make dinner reservations NO LATER THAN FRIDAY, April 15, 2011. This month's entrée is Beef Wellington. Dinner will cost \$8 and checks can be made out to the SSP. If you have dietary restrictions, please indicate them when you RSVP. **Parking Instructions:** The Duquesne University Parking Garage is located on Forbes Avenue. Upon entering the garage, receive parking ticket and drive to upper floors. Pick up a parking chit at the dinner or meeting. Contact Duquesne University if any difficulties arise.

Wednesday, April 20, 2011

Duquesne University, 5:30 p.m.  
Pappert Hall in the Bayer Learning Center

**“A Biochemical-Biophysical Investigation of Hemoglobin  
from an Extinct Animal, Woolly Mammoth”**

**Dr. Chien Ho**

Department of Biological Sciences, Carnegie Mellon University

Mammoths are an extinct group of elephants, whose ancestors migrated out of Africa about 3.5 million years ago and spread across Eurasia. The well-known one is the woolly mammoth, a close cousin of living elephants (1,2,3). Woolly mammoths first appeared in the middle Pleistocene more than 400,000 years ago, most likely in northeastern Siberia. They were adapted to the extreme cold, with a dense undercoat, guard hairs up to 3 feet long, and small, fur-lined ears. An international team of scientists carried out a collaborative research to resurrect hemoglobin (a protein responsible for transport of oxygen from the lungs to tissue) from woolly mammoth. Using DNA extracted from a ~43,000 year-old Siberian mammoth specimen, team members followed stringent ancient DNA methods to amplify the coding regions of the woolly mammoth genes and further isolated DNA and mRNA from Asian elephant blood and amplified its adult-expressed  $\alpha$ - and  $\beta$ -like globin genes. There are only four amino acid substitutions in the hemoglobin molecule from Asian elephant to woolly mammoth, namely, one in the  $\alpha$ -chain,  $\alpha 5\text{Lys} \rightarrow \text{Asn}$  and three in the  $\beta$ -like chain,  $\beta 12\text{Thr} \rightarrow \text{Ala}$ ,  $\beta 86\text{Ala} \rightarrow \text{Ser}$ , and  $\beta 101\text{Glu} \rightarrow \text{Gln}$ . The cDNA sample coding for Asian elephant hemoglobin was sent to our laboratory at Carnegie Mellon University. We constructed a plasmid for expressing the hemoglobin of Asian elephant using our existing plasmid for expression human hemoglobins in *Escheria coli* (3). We then constructed an expressing plasmid for woolly mammoth hemoglobin via site-directed mutagenesis on that for Asian elephant and expressed the recombinant hemoglobins for woolly mammoth and Asian elephant from these two plasmids (3). These recombinant hemoglobins were then used to measure their respective functional properties as well to determine their structures by NMR spectroscopy. In this presentation, we shall give a summary of our findings to gain some insights into the biochemical basis for mammoth hemoglobin to adapt to cold temperature in the Arctic environment.

**References:**

1. A. Lister and P. Bahn, “Mammoths: Giants of the Ice Age”, University of California Press, Berkeley and Los Angeles, CA, Revised Edition, 2007.
2. T. Mueller, “Ice Baby”, National Geographic, pp. 30-65, May 29, 2009.
3. K. L. Campbell, J. E. E. Roberts, L. N. Watson, J. Stetefeld, A. M. Sloan, A. V. Signore, J. W. Howatt, J. R. H., Tame, N. Rohland, T.-J. Shen, J. J. Austin, M. Hofreiter, C. Ho, R. E. Weber, and A. Cooper, “Substitutions in Woolly Mammoth Hemoglobin Confer Biochemical Properties Adaptive for Cold Tolerance”, *Nature Genetics* 42, 536-540 (2010).

**Bio**

Dr. Ho received an MA and B.A. in Chemistry from Williams College, a Ph.D. in Physical Chemistry from Yale University and MA from the Massachusetts Institute of Technology concerning post doctoral biochemistry.

Dr. Ho has worked at several positions in the fields of chemistry, molecular biology, biophysics and biochemistry. These include being research chemist, Union Carbide Corporation; Assistant Professor of Biophysics, University of Pittsburgh; Associate Professor of Molecular Biology, Dept. of Biophysics and Microbiology and Acting Chairman, Univ. of Pittsburgh; Professor of Molecular Biology, Dept. of Biophysics & Microbiology, University of Pittsburgh and Professor/Head, Dept. of Biol. Sci., Carnegie Mellon University. Currently, Dr. Ho is Director, Pittsburgh NMR Center for Biomedical Research, and Alumni Professor of Biological Sciences, Carnegie Mellon University.

Chien Ho has authored or coauthored hundreds of scientific papers and has received several prestigious honors and awards which include the John Simon Guggenheim Fellowship, 1970 - 1971; Elected to Membership in the Academia Sinica, 1980; Alumni Professor of Biological Sciences, Carnegie Mellon University, 1985-present; National Heart, Lung, and Blood Institute MERIT Award, 1986-1996; Fellow of the International Society of Magnetic Resonance, 2009.

## Banana Peels Get A Second Life As Water Purifier

*“Banana Peel Applied to the Solid Phase Extraction of Copper and Lead from River Water: Preconcentration of Metal Ions with a Fruit Waste”*

Industrial & Engineering Chemistry Research

To the surprisingly inventive uses for banana peels ? which include polishing silverware, leather shoes, and the leaves of house plants ? scientists have added purification of drinking water contaminated with potentially toxic metals. Their report, which concludes that minced banana peel performs better than an array of other purification materials, appears in ACS’s journal Industrial & Engineering Chemistry Research.

Gustavo Castro and colleagues note that mining processes, runoff from farms, and industrial wastes can all put heavy metals, such as lead and copper, into waterways. Heavy metals can have adverse health and environmental effects. Current methods of removing heavy metals from water are expensive, and some substances used in the process are toxic themselves. Previous work has shown that some plant wastes, such as coconut fibers and peanut shells, can remove these potential toxins from water. In this report, the researchers wanted to find out whether minced banana peels could also act as water purifiers.

The researchers found that minced banana peel could quickly remove lead and copper from river water as well as, or better than, many other materials. A purification apparatus made of banana peels can be used up to 11 times without losing its metal-binding properties, they note. The team adds that banana peels are very attractive as water purifiers because of their low cost and because they don’t have to be chemically modified in order to work.

*The authors acknowledge funding from the São Paulo Research Foundation.*

## ACS Energy Technology Group Pittsburgh Section &

## The Pittsburgh Section AIChE

Tuesday, April 12, 2011

### “Major U.S. DOE Sponsored Fossil Energy Projects”

**Thomas Sarkus**

Director of the Project Financing & Technology Deployment Division  
at U.S. DOE’s National Energy Technology Laboratory

**Spaghetti Warehouse**

26<sup>th</sup> & Smallman Streets, Strip District, Free parking behind the restaurant

**Social Hour: 6:00 pm    Dinner: 6:30 pm**

**Presentation: 7:30 pm**

Current emphasis within the U.S. Department of Energy’s (U.S. DOE’s) research, development & demonstration programs revolves mainly around CO2 capture & sequestration (CCS) technologies. This presentation will focus on active commercial-scale projects within U.S. DOE’s Fossil Energy program. These large-scale applied technology projects are being co-funded with industry under three distinct U.S. DOE programs: the Clean Coal Power Initiative, the Industrial Carbon Capture & Sequestration demonstration program, and FutureGen 2.0. Technologies include: Post-Combustion CCS, gasification with CCS, and oxy-combustion with CCS.

Tom Sarkus provides expert guidance and consultation to major DOE-funded clean coal technology and CCS projects. Technology demonstration projects administered under his purview have garnered world-wide attention and numerous awards. A Donora native, his efforts have contributed to the capture or avoidance of millions of tons of air pollutant emissions at significantly reduced compliance costs which have been estimated in the billions of dollars. Tom received degrees in chemistry, geology, and earth science from California University of Pennsylvania, and a law degree from Duquesne University.

For reservations, please contact Al Mann by Monday, April 11 at [alfred.mann@verizon.net](mailto:alfred.mann@verizon.net). Our meetings are open to all.

The cost of the dinner is \$16 including tax and gratuity. Please specify your preference from the following menu choices: •Spaghetti with meatballs •15-layer lasagne •Four-cheese manicotti •Fettuccini Alfredo •Grilled chicken Caesar salad •Also indicate special needs such as vegetarian, gluten-free, etc.

## Krzysztof Matyjaszewski To Receive 2011 Wolf Prize in Chemistry

*Award for "Deep Creative Contributions to the Chemical Sciences" Will Be Bestowed  
by Israeli President and Minister of Education in May*



Krzysztof Matyjaszewski, the J.C. Warner Professor of the Natural Sciences at Carnegie Mellon University's Mellon College of Science, has been named a recipient of the 2011 Wolf Prize in Chemistry from Israel's Wolf Foundation.

The Wolf Prize is given every year in four out of five categories, in rotation: agriculture, chemistry, mathematics, medicine and physics. A total of 262 scientists from around the world have been honored with this prize over the past 33 years. One out of every three Wolf Prize Laureates in chemistry, physics and medicine have later received a Nobel Prize. Matyjaszewski is the second Carnegie Mellon professor to receive a Wolf Prize. The late John Pople received the 1992 Prize in Chemistry for his contributions to theoretical chemistry. Pople went on to receive the Nobel Prize in Chemistry in 1998.

The Wolf Prize Committee commended Matyjaszewski for his "groundbreaking research in synthesis of organic materials, and in particular, in the critical area of controlled, efficient, safe and economical polymer synthesis." Matyjaszewski invented the process of atom transfer radical polymerization (ATRP), one of the most effective and most widely used methods of controlled radical polymerization (CRP). This method allows scientists to create polymers from many different component parts, called monomers, in a piece-by-piece fashion, precisely controlling the polymer's composition. By assembling polymers in such a manner, scientists have been able to create a wide range of new materials with highly specific, tailored functionalities. This technology also allows for the production of "smart" materials that can respond to altered environments, such as changes in pressure, acidity, light exposure or other variables.

Born in Poland, Matyjaszewski received his doctorate from the Polish Academy of Sciences in 1976 and completed a postdoctoral fellowship at the University of Florida in 1977. From 1978 until 1984 he was a research associate at the Polish Academy of Sciences. After spending a year at the University of Paris, Matyjaszewski came to Carnegie Mellon in 1985 and was appointed the J.C. Warner Professor of the Natural Sciences in 1998. While at Carnegie Mellon, Matyjaszewski founded the Center for Macromolecular Engineering, served as head of the Department of Chemistry from 1994 to 1998, and was named a University Professor in 2004.

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## 2011 Tripartite Symposium

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www.chem.cmu.edu/acs-pgh/

**Effective Practices and  
Challenges in  
STEM Education for  
Western Pennsylvania**

**Wednesday, May 4, 2011  
12:00 pm - 6:30 pm**

**University of Pittsburgh  
Ashe Auditorium**

Chevron Science Center, 219 Parkman  
Avenue, Pittsburgh, PA 15260

**SAVE THE DATE!!!!**

The 2011 Tripartite Symposium, jointly sponsored by the Spectroscopy Society of Pittsburgh, Society for Analytical Chemists of Pittsburgh, and the American Chemical Society, will focus on Science Education from activities to outcomes to challenges. The symposium will feature six speakers primarily addressing programs and issues in middle school through the undergraduate years. On-site registration will begin at noon, talks will begin at 1:00 pm and a reception will begin at 5:20 pm.

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## Services

### Volunteers Needed!

There are a number of volunteer opportunities in the Pittsburgh ACS section! If you are interested in volunteering, please contact Jim Manner at [manner1@comcast.net](mailto:manner1@comcast.net)!

### Crucible Deadline

The deadline for items submitted to The Crucible is the 1<sup>st</sup> of the month prior to publication.

For example, all items for the May 2011 issue must be to the editor by April 1, 2011.

### The Crucible

The Crucible is published monthly, August through May. Circulation, 2,500 copies per month. Subscription price, six dollars per year. All statements and opinions expressed herein are those of the editors or contributors and do not necessarily reflect the position of the Pittsburgh Section.

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# The Crucible

A newsletter of the Pittsburgh Section of the American Chemical Society  
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## Pittsburgh Area Calendar

### Saturday, April 2

#### Society for Analytical Chemists of Pittsburgh Continuing Education Symposium

##### *“Regenerative Medicine and Stem Cell Research”*

Duquesne University, Laura Falk Auditorium - Mellon Hall of Sciences, 600 Forbes Ave., Pittsburgh, PA

### Monday, April 4

#### Society for Analytical Chemists of Pittsburgh

##### *“New Analytical Chemistry and the Fight Against Performance-Enhancing Drugs in Sport”*

Larry Bowers, Ph.D., Chief Science Officer, the US Anti-Doping Agency  
Duquesne University, Laura Faulk Hall

### Tuesday, April 12

#### ACS Pittsburgh Energy Technology Group Pittsburgh Section AIChE

##### *“Major U.S. DOE Sponsored Fossil Energy Projects”*

Thomas Sarkus, Director of the Project Financing & Technology Deployment Division at U.S. DOE's National Energy Technology Laboratory  
Spaghetti Warehouse, 26<sup>th</sup> & Smallman Streets, Strip District

### Thursday, April 14

#### Mass Spectrometry Discussion Group of Pittsburgh

##### *Roundtable Discussion: Current Issues & Opportunities in MS Based Biomarker Discovery*

Grand Concourse - Ladies' Waiting Room, 100 West Station Square Drive, Pittsburgh, PA

### Wednesday, April 20

#### Spectroscopy Society of Pittsburgh Technology Forum

##### *“A Biochemical-Biophysical Investigation of Hemoglobin from an Extinct Animal, Woolly Mammoth”*

Dr. Chien Ho, Department of Biological Sciences, Carnegie Mellon University  
Duquesne University, Pappert Hall in the Bayer Learning Center

#### Spectroscopy Society of Pittsburgh

##### *“Dynamic Nuclear Polarization NMR at High Magnetic Fields, Why Two Electrons Are Better Than One”*

R.G. Griffin, Francis Bitter Magnet Laboratory and Department of Chemistry, Massachusetts Institute of Technology  
Duquesne University, Pappert Hall in the Bayer Learning Center

### Saturday, May 7

#### Spectroscopy Society of Pittsburgh Continuing Education Symposium

##### *“Financial Planning in a Global Economy”*

Pittsburgh Athletic Association - 2<sup>nd</sup> Floor Library  
4215 Fifth Avenue, Pittsburgh, PA