

# The Crucible



<http://membership.acs.org/P/Pitt>

Volume: XCIII No.8

April 2008

## Call for Nominations The Pittsburgh Award



The Pittsburgh Award was established in 1932 by the Pittsburgh Section of ACS to recognize outstanding leadership in chemical affairs in the local and larger professional community. This Award symbolizes the honor and appreciation accorded to those who have rendered distinguished service to the field of chemistry.

The Award consists of a plaque presented annually at a Section dinner. Members of the Pittsburgh Section, or in exceptional cases, non-members, who have done work worthy of recognition toward increasing chemical knowledge, promoting the chemical industry, benefiting humanity, or advancing the Pittsburgh Section, are eligible for consideration.

Nominations for the Pittsburgh Award are solicited from the membership of the Pittsburgh Section. The form can be found on the section's website, <http://membership.acs.org/P/Pitt>. Click on the awards link at the top of the page. Please send all nominations to Pittsburgh Section Chair-Elect, Nick Tsarevsky, [nvt@andrew.cmu.edu](mailto:nvt@andrew.cmu.edu) by May 15, 2008.

For more information about the nomination process, contact Nick at 412-268-1872.

For a complete listing of former Pittsburgh Award winners see the Pittsburgh Award Section on the Pittsburgh Section's website, <http://membership.acs.org/P/Pitt>.

Stay up-to-date on all the happenings of the Pittsburgh Section ACS by visiting the section's website.

<http://membership.acs.org/P/Pitt>

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**ACS “ON THE ROAD” MEETING**  
Pittsburgh Section ACS

**Saturday, April 19, 2008**  
**3:00 p.m., Geneva College**

**“Chocolate: Food for the Gods”**

Dr. Howard Peters  
ACS Director-at-Large, 2005-07

Howard Peters has a passion for chocolate. Besides covering the history of chocolate, he'll cover the chemistry and biochemistry of cocoa, the health aspects and trivia. You'll sample some chocolate and maybe win 10 lbs. of chocolate! This will be a sweet lecture.

Dr. Howard Peters, Geneva College graduate in chemistry 1962, chemist & patent attorney, retired partner: Peters Verny LLP, Palo Alto, Calif.

A full day of events are planned to celebrate 50 years of approved status for the Geneva College Chemistry Department. Local section members are invited to attend any or all of these events.

- 9:00 a.m.      Registration - Old Main lobby
- 9:30 a.m.      Chemistry Symposium session- Northwood Hall, Room 013 *See details below*
- 12:30 p.m.     Lunch: \$8.00 *Must register in advance* - Northwood Hall, Room 013
- 1:30 p.m.      Informal research and career poster session by current students, faculty and Geneva College alumni- Science and Engineering Building, Second floor lobby
- 3:00 p.m.      Public lecture: “Chocolate Food for the Gods”, Dr. Howard Peters - McCartney Library

***The morning Chemistry Symposium session will feature presentations by Geneva College alumni.***

**“History and Overview of Chemistry at Geneva College”**

Dr. John Stahl, CHM '79, Professor and Chair, Geneva College Department of Chemistry.

**“Synergistic Actions of Halocarbons on Nerve Growth - Implications for Autism”**

Dr. Raymond Stephens, CHM '62, Professor Emeritus, Boston University School of Medicine, Boston, Mass. Department of Physiology and Biophysics.

**“Modeling and Simulation of Nanocomposites”**

Dr. Sarah-Jane Frankland, CHM '91, Senior Research Scientist, National Institute of Aerospace, Hampton, Va.

**“Analytical Imaging at the Interface of Chemistry and Biology”**

Dr. Jerilyn Timlin, CHE '95, Research Associate, Sandia National Laboratories, Albuquerque, N.M.

**To register: e-mail [events@geneva.edu](mailto:events@geneva.edu) or call 724-847-6520.**

**Directions:** Directions are available on the Geneva College website, [www.geneva.edu](http://www.geneva.edu). Click on “Parents and Friends,” and “Directions to Geneva College.” Campus map is available at the bottom of any Web page. Free parking is available in any faculty/student lot on campus during the event.



## SPECTROSCOPY SOCIETY OF PITTSBURGH



**April Meeting**  
**Wednesday, April 16, 2008**

**Duquesne University, Mellon Hall of Science**  
(Laura Falk Hall)

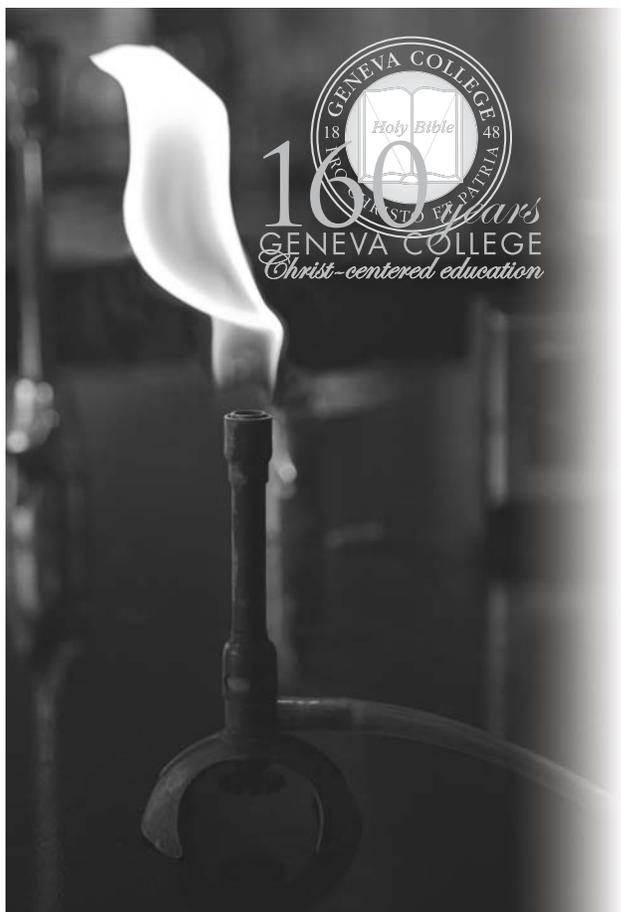
6:00 PM - Social Hour  
6:30 PM - Dinner  
(City View Cafe - 6<sup>th</sup> Floor)

*“Fundamental Development of Vibrational Spectroscopy for Industrial Applications”*

**Dr. D. Bruce Chase, Recipient of the 2007 Maurice Hasler Award**  
**E.I. DuPont de Nemours**

**Dinner Reservations:** Please email Carolyn Benga at [crbssp@yahoo.com](mailto:crbssp@yahoo.com) or call (412) 487-0915 to make dinner reservations **NO LATER THAN FRIDAY, April 11, 2008**. Dinner will cost \$8 and checks can be made out to the SSP. If you have dietary restrictions, please let Carolyn know 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. If any difficulties arise, contact Dr. Mitch Johnson at Duquesne University.



*Geneva College Department  
of Chemistry celebrates*

**American Chemical Society  
(ACS) Approval**

**50  
YEARS**

**SATURDAY, APRIL 19**

**9:30 a.m.** Chemistry symposium, featuring alumni presentations on *Synergistic actions of balocarbons on nerve growth: implications for autism; Analytical imaging at the interface of chemistry and biology; and Modeling and simulation of nanocomposites.*

**1:30 p.m.** Informal poster session with faculty, alumni and current students.

**3:00 p.m.** *Chocolate: food for the gods*, by Dr. Howard Peters, ACS Director-at-Large, 2005-07.

Registration begins at 9:00 a.m. A box lunch (\$8) will be served at 12:00 p.m. To register, call 724.847.6520 or e-mail [events@geneva.edu](mailto:events@geneva.edu).

Geneva College Beaver Falls, Pennsylvania



# Society for Analytical Chemists of Pittsburgh Continuing Education Symposium



## *“Excitements in Nanoscience & Nanotechnology - An Overview of Regional Adventures”*

**Saturday, April 19, 2008**

8:30 AM - 1:30 PM

Duquesne University  
Laura Falk Hall, Mellon Science Building  
Open to the Public

- 8:30 AM Registration & Refreshments
- 9:00 AM Introduction
- 9:05 AM “Nanotechnology, The New Revolution”  
Dr. Alan Brown, Executive Director, PA Nanocenter
- 10:00 AM “Commercial Perspectives of Nanotechnology in the Materials Sector”  
Dr. Dan Rardon, Manager Advanced Technologies, PPG Industries Inc.
- 10:55 AM Break
- 11:10 AM “Plasmonics: An Enabling Technology for Chip-Scale Implementation of Optical Spectroscopic Instruments”  
Dr. Hong Soo Kim, Professor and Co-Director, Petersen Institute of NanoScience and Engineering, University of Pittsburgh
- 12:15 PM Lunch and Discussion (City View Café, Duquesne Student Union)

**Registration Deadline: April 11, 2008**

**Registration Fee: \$15 (\$5 for Student and Retiree) - Luncheon & parking included**

Please make check payable to SACP and mail Registration Form and Fee to:

Ms. Valarie Daugherty  
SACP - Continuing Education Symposium  
300 Penn Center Blvd., Suite 332  
Pittsburgh, PA 15235-5503

For further information, please go to [www.sacp.org](http://www.sacp.org) or contact [Daugherty@pittcon.org](mailto:Daugherty@pittcon.org) or [Chan@pittcon.org](mailto:Chan@pittcon.org)  
Phone: 412-825-3220 Ext 204 FAX: 412-825-3224

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### SACP 2008 Continuing Education Symposium REGISTRATION FORM

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

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

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

E-Mail (Preferred) or Phone: \_\_\_\_\_

**POLYMER GROUP  
Pittsburgh Section  
American Chemical Society**

**Tuesday  
April 22, 2008**

Duranti's Restaurant  
128 N. Craig St. Pittsburgh, PA

Social Hour (cash bar) 5:30 pm  
Dinner 6:30 pm  
Technical Presentation 7:30 pm

**“Regioregular Poly(3-alkylthiophene)s for Use in Printable  
Electronic Applications: Transistors and Sensors”**

**Genevieve Sauve**

**Department of Chemistry, Carnegie Mellon University**

Due to their excellent electrical properties, regioregular poly(3-alkylthiophene)s (P3AT)s constitute one of the most promising class of conjugated polymers for use in printable electronic applications. In particular, regioregular poly(3-hexylthiophene) (P3HT) has received considerable attention for use in organic field-effect transistors (OFET)s and sensors due to its high charge carrier mobility, solution processability and ease of synthesis. In order to optimize OFETs, several well-defined P3ATs with different side-chain lengths were evaluated in OFETs, and record high mobilities for several P3ATs were measured. To further tune the structure and properties of P3HT, well-defined diblock copolymers of P3HT and a coil polymer were also explored in OFETs. Surprisingly high charge carrier mobilities were measured for all diblock copolymers studied to date, regardless of the nature of the second block, and with P3HT content as low as 17 wt%, due to favorable self-assembly at the interface. These results demonstrate the promise of using block copolymers as organic semiconductors in plastic electronics. The use of polythiophene in integrated nanosensors will also be discussed.

For dinner reservations please contact Hongying Zhou (Tel: 412-492-5284; email: zhou@ppg.com) no later than Monday, April 21, 2008. The cost of dinner is \$19.00 per person; discount rate of \$11.00 for retirees; no charge for students. All are welcome!



**Wednesday  
April 16, 2008**

**“The Intelligent  
Workplace ”**

**Dr. Volker Hartkopf  
Carnegie Mellon University**

**ENERGY  
TECHNOLOGY  
GROUP**  
Pittsburgh Section,  
American Chemical  
Society

**Tuesday, April 22, 2008**

Joint meeting with the  
Pittsburgh Section of the  
American Institute of  
Chemical Engineers (AIChE)

**Time, place, speaker, and  
topic to be announced.**

**Details to be provided via  
e-mail as soon as available**



# Society for Analytical Chemists of Pittsburgh



## April Meeting Former Chair's Night

**Monday, April 7, 2008**  
Duquesne University, Maurice Falk Hall

Dinner - Duquesne Room (3<sup>rd</sup> Floor) 6:30 P.M.  
Technical Presentation 8:00 P.M.

### *“Rachel Carson, The Science, the Myth, and the Message”*

Patricia M. DeMarco, Ph.D.  
Executive Director

**Abstract:** Rachel Carson has been recognized as one of the 100 most influential people of the twentieth century for galvanizing international attention to the problems of pesticides. Her credibility came not only from the vivid imagery of her writing but from the intensely detailed work she did on the ecology of the intertidal space between land and sea along the entire east coast of the United States. Her published books moved public opinion. Her testimony to the Congressional Committee on Pesticides and Toxic Chemicals in 1963 moved Congress. The Environmental Protection Agency, the Clean Air Act, the safe Drinking Water Act followed within the decade. Despite Rachel Carson's careful documentation and thorough research of each statement she made, *Silent Spring* caused great agitation among the industries which manufactured the pesticides she initially targeted. The massive campaign to discredit her work launched before the book was even published continues to this day. She did not live to see the impact of her work, but her message remains relevant to us today. This talk will include a reflection on Carson's scientific work, as shown through her 1953 paper presented to the National Academy of Sciences, as well as a discussion her overall legacy.

**Bio:** Patricia DeMarco has a thirty year career in energy and environmental policy development and implementation. She received a Bachelor of Science and a Doctorate in Biology from the University of Pittsburgh. She pursued a career in research at Yale University and at Boston University with a focus on mutation mechanisms. She turned her attention to energy and environmental policy through her work as Executive Director of the Power Facilities Evaluation Council and as staff to the Governor of Connecticut on such issues as nuclear power plant safety, energy conservation, and clean fuels technology. She worked as the manager of resource development for the Connecticut Municipal Electric Energy Co-operative and, as a loaned executive, started up a technology development firm to commercialize declassified defense technology.

She operated and sold her own business, the Energy Roundtable, which merged with another firm to become E Cubed Corporation, an energy trading company. She moved to Alaska in 1998 to take the position of President of the Anchorage Economic Development Corporation. While in Alaska, she served as a Commissioner of the Regulatory Commission of Alaska, with jurisdiction over all electric, gas, water, refuse utilities and oil and gas pipelines. For the last two years, she has served as Associate Dean for the College of Business and Public Policy at the University of Alaska Anchorage.

She returned to her hometown of Pittsburgh in September 2005, and is now the Executive Director of the Rachel Carson Homestead Association in Springdale, PA.

**Dinner Reservations:** Please email Valarie Daugherty, SACP Administrative Assistant by Thursday, March 21, 2008 to make dinner reservations. Should you not have email, please call Valarie at 412-825-3220 ext 204. Dinner will cost \$8 (\$4 for students) and checks can be made out to the SACP. If you have any dietary restrictions, let Valarie know when you leave message.

**Parking:** Duquesne University Parking Garage entrance is on Forbes Avenue. Upon entering the garage receive parking ticket and drive to upper floors. Pick up a parking sticker at the dinner or meeting. Contact Dr. Mitch Johnson at Duquesne University if any difficulties arise.

# ACS Pittsburgh Chemists Club

Pittsburgh Section, American  
Chemical Society

**April 29, 2008**

*“The Pardoner’s Tale; Things Are Not What They Seem  
New and Intriguing Facts About Phosgene, Mustard and Cyanide Gases*

Dr. Mark Zattola,

U.S. Army Medical Research Institute for Chemical Defense

**Duranti’s Restaurant**

128 N. Craig St., Pittsburgh, PA

6:00 PM

Cocktail Time - Cash Bar

6:45 PM Dinner

8:00 PM Program

For reservations, please call Ed Martin by noon, **Tuesday, April 25, 2008** at (724) 335-0904 or e-mail at [esm@icubed.com](mailto:esm@icubed.com).

**Abstract:** Chaucer’s Canterbury Tale “The Pardoner’s Tale” shows that one needs be wary of appearance and snap judgments. The same warning can be given to chemists. The chemistry and toxicity of phosgene, mustard and cyanide has been considered to be well known for a very long time. Based on sound chemical judgment and meager data, the mystery of these compounds was long ago considered to be solved. However, recent advances have shown that their chemistry and toxicity is markedly different. Detailed investigation into these toxic compounds using computational and spectroscopic techniques have revealed new and intriguing facts about their chemistry, mechanism of action, and their toxicity.

**Bio:** Dr. Mark Zottola earned a B.S. in both Mathematics and Chemistry at Marietta College and in 1983 earned his M.S. in synthetic organic chemistry under the late Dr. Conrad Kowalski. He worked for ICI Pharmaceuticals for several years. Then in 1988 Mark returned to academic pursuits at Duke University where he received a Ph.D. in both synthetic organic chemistry (Approaches to the Total Synthesis of Tetrodotoxin) and computational chemistry (Effect of Boronated Nucleotides on the Structure and Dynamic Behaviour of Duplex DNA) in 1994. This latter work produced the first paper and poster on dihydrogen bonds, the chemistry deemed as crucial for fuel cells. After serving as a consultant to Molecular Simulations Inc. in Boston for 2 years, Mark moved to Birmingham Alabama to work at the Alabama Supercomputer Center as their chemistry analyst. Mark also was given an adjunct faculty position to the department of computer science. For over 6 years in addition to his normal work responsibilities, Mark served as mentor for more than 250 local high school students competing in the state-sponsored science fair. Moving to the Army Research Laboratory at the Aberdeen Proving Ground, he worked there 5 years before moving to the US Army Medical Research Institute for Chemical Defense to join the Cyanide Medical Countermeasures Team. Mark is currently acting group leader for this effort.

Of all his accomplishments, Mark is most proud of the 250 students he mentored while in Birmingham. In Mark’s opinion, the opportunity to train, encourage and refine young minds is a solemn duty every highly educated individual owes their society and the world.

## This Month in Chemical History

Harold Goldwhite, California State University, Los Angeles

hgoldwh@calstatela.edu

Since 1903 the Chemical Society of London has been publishing annual reports on the progress of chemistry. This series was possibly based on the example of Berzelius, the great Swedish chemist, who for many years early in the 19th. Century single-handedly compiled his annual personal review of significant work in chemistry. We are near the beginning of a new year, and I have before me Volume V of the Chemical Society's reports for the year 1908 (published, naturally, in 1909) just 100 years ago. It is striking that this report is economically contained in fewer than 300 pages including both name and subject indexes. I plan to devote this column and the next to an overview of my selections from this report.

But before I get into specifics, let's examine the historical context. The electron was discovered by Thomson only ten years ago. Radioactivity is, if you'll pardon the pun, the hot new research area. Rutherford and his students Geiger and Marsden have just begun their experiments on the interactions between alpha particles and metal foils that will lead to the concept of the nuclear atom. Gilbert N. Lewis is sketching in his notebook at Berkeley his first notions of the octet rule.

In this context the comments by Alexander Finlay on the structures of atoms make fascinating reading. He begins at the beginning: the evolution of the heavier elements from lighter ones as deduced from the spectra of nebulae. "...[These] consist of lines recognizable as those of hydrogen and helium, as well as two other lines not belonging to any known substance. From these four initial substances or protons [note the different meaning of the word from our current usage; hg] all the other elements are regarded as being evolved by the condensation round these protons (themselves formed of corpuscles) of corpuscles so as to form stable systems capable of separate existence. Whatever the internal structure of these atoms may be, they may be regarded as being built up of concentric "rings", or assemblages of corpuscles."

Finlay is here drawing on theoretical speculations of A.C. and A.E. Jessup which led them to propose the existence of two new elements, as yet undiscovered terrestrially, which they called proto-glucinum (glucinum was the generally accepted name for the element we now call beryllium) and proto-boron. These elements occupied the first row of the

Jessup's periodic table at the head of Groups 2 and 3.

Turning from the evolution of the elements to the electronic theory in chemistry we see again the early stirrings of what would become a new view of chemical reactivity and reactions. Sir William Ramsay, discoverer of the noble gases, and in 1908 President of the Chemical Society, outlined his views in that year's Presidential Address. "Electrons are atoms of the chemical element electricity; they possess mass; they form compounds with other elements; they are known in the free state, that is, as molecules; they serve as the 'bonds of union' between atom and atom.

The electron may be assigned the symbol E". In Ramsay's view the reaction forming sodium chloride from its elements can be symbolized as  $ENa + Cl = NaECl$ , with the electron E as the bond of union between the sodium and chlorine. "On solution the electron remains with the chlorine giving chloridion." Arrhenius' views on dissociation into ions of electrolytes in aqueous solution, first enunciated in his thesis some 20 years earlier, are by now widely accepted; but not yet carried over to the structures of ionic solids. That had to wait another decade for the Braggs' X-ray diffraction results.

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# ChemShorts for Kids -- 2008

Copyright ©2008 by the Chicago Section of the American Chemical Society  
by Dr. Kathleen A. Carrado, Argonne National Labs kcarrado@anl.gov ChemShorts Home

The Elementary Education Committee of the ACS Chicago Section presents this column. They hope that it will reach young children and help increase their science literacy. Please share with children and local teachers.

Please note: All chemicals and experiments can entail an element of risk, and no experiments should be performed without proper adult supervision.

**December, 2007**

## Mustard Mystery

Kids, is there really silver in that silver coin? Even though our dimes, quarters, half dollars, and “silver” dollars are silver in appearance, those minted after 1971 actually have no silver in them. Silver was completely removed from dimes and quarters in 1965 and replaced with an outer layer of copper-nickel alloy bonded to an inner core of pure copper. The half dollar and “silver dollar” followed suit in 1971. Believe it or not, our “copper” pennies nowadays are mostly zinc and our “silver” coins are mostly copper!

Dimes and quarters minted before 1965 were composed of an alloy of 90% silver and 10% copper, and they are considered somewhat valuable by collectors. You can easily test for the presence of silver with a simple experiment. Using a plastic knife, apply a generous portion of mustard (yes, the yellow stuff you put on your hotdog) to both pre-1965 and post-1965 dimes and quarters. Let them sit overnight on a paper towel. The next day, rub off the mustard. A black spot will remain on the true silver coin but not on a non-silver coin.

What’s happening? Mustard contains natural sulfur compounds. Sulfur is an element that is very common in our day-to-day world. Sulfur reacts with the silver to form a black powder (a “precipitate”) of silver sulfide. The chemical formula for silver sulfide is  $\text{Ag}_2\text{S}$ . One of the challenges for this experiment will be in hunting down the pre-1965 coins - good luck and happy hunting!

Here is an interesting tidbit. Eggs also contain a lot of sulfur. If you eat eggs with a silver plated fork you will find that your fork has black tarnish on it when you are finished. You made a new chemical while eating your breakfast!

Check out the ChemShorts October 2000 article on “The Science of Money” for other interesting trivia about coins and paper money (<http://membership.acs.org/C/Chicago/ChmShort/CS00.html#10.00>).

Reprinted with permission from Dr. Kathleen A. Carrado, Chicago Local Section. An archive of all previously published ChemShorts is available online at <http://membership.acs.org/C/Chicago/home.html>.

*ACS Cut and Paste January/February 2008*

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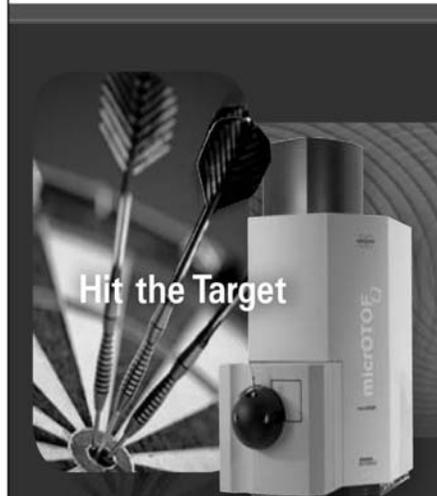
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## The Crucible

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# Pittsburgh Area Calendar

## April

- Mon. 7 **Society for Analytical Chemists of Pittsburgh (SACP)**  
Duquesne University, Maurice Falk Hall  
Former Chair's Night  
*"Rachel Carson, The Science, The Myth and The Message"*  
Patricia M. DeMarco, Ph.D., Executive Director, Rachel Carson Homestead Association
- Wed. 16 **Spectroscopy Society of Pittsburgh Technology Forum**  
Duquesne University, Mellon Hall of Science, Laura Falk Hall  
*"The Intelligent Workplace"*  
Dr. Volker Hartkopf, Carnegie Mellon University
- Wed. 16 **Spectroscopy Society of Pittsburgh**  
Duquesne University, Laura Falk Hall  
*"Fundamental Development of Vibrational Spectroscopy for Industrial Applications"*  
Dr. D. Bruce Chase, Recipient of the 2007 Maurice Hasler Award, E.I. DuPont de Nemours
- Sat. 19 **ACS "On the Road Meeting"**  
Geneva College  
*"Chocolate: Food for the Gods"*  
Dr. Howard Peters, ACS Director-at-Large, 2005-07
- Sat. 19 **Society for Analytical Chemists of Pittsburgh**  
**Continuing Education Symposium**  
Duquesne University  
*"Excitements in Nanoscience & Nanotechnology - An Overview of Regional Adventures"*
- Tues. 22 **Pittsburgh Section ACS Energy Technology Group**  
Joint Meeting with the Pittsburgh Section of the American Institute of Chemical Engineers (AIChE)  
Time, Place, Speaker TBA
- Tues. 22 **Pittsburgh Section ACS Polymer Group**  
Duranti's Restaurant  
*"Regioregular Poly(3-alkylthiophene)s for Use in Printable Electronic Applications: Transistors and Sensors"*  
Genevieve Suave, Department of Chemistry, Carnegie Mellon University
- Tues. 29 **Pittsburgh Section Chemists Club**  
Duranti's Restaurant  
*"The Pardoner's Tale: Things Are Not What They Seem; New and Intriguing Facts About Phosgene, Mustard and Cyanide Gases"*  
Dr. Mark Zattola, U.S. Army Medical Research Institute for Chemical Defense

## The Crucible

A newsletter of the Pittsburgh Section of the American Chemical Society

124 Moffett Run Rd.  
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