



In Conjunction with the American Chemical Society  
Student Affiliates at the University of Pittsburgh



Volume 15, Issue 1

September 2, 2005

## THE WELCOME BACK EDITION

*Dear Colleagues: Welcome Back!!!!*

*Welcome back to another exciting year not just at the University of Pittsburgh but also for us here in the American Chemical Society. For those freshmen amongst us, welcome; we are happy to have you join us. I know that five years ago when I was a freshman, joining a rather large society such as our own might have been a daunting task but let me clear up this matter, it has never been easier to get involved with us! This year we have sent our Senior Chem Major News Editor to look at all the events and programs that the ACS at our University takes part in and to scout out what he thinks are the Top Five.*

### **Number Five-High School Chemistry Olympics**

*Once each year some three hundred regional high school students come to the Chemistry Department for a one-day chemistry competition. The students (in teams of three) perform various experiments, report results and answer questions on topics found in general and organic chemistry. The reports are graded and the teams are ranked based on their performance. The top three teams in the various categories of first-year chemistry, second-year chemistry and organic chemistry receive medals and cash awards.*

### **Number Four-National Chemistry Week**

*National Chemistry Week celebrations are held by the Pittsburgh Section of the American Chemical Society at the Carnegie Science Center of Pittsburgh. During this one day celebration, people of all ages are invited to tour the Science Center to view and participate in many of the displays that various regional ACS chapters have created.*

### **Number Three-Saturday Science Academy**

*This program serves to give local minority students "hands-on" laboratory experience in chemistry. Once in the fall and once in the spring local high school students come to the department for a three hour session where they can carry out various chemistry experiments and learn the basic principles of synthetic and analytical chemistry under the guidance of our undergraduate and graduate chemistry majors.*

### **Number Two-YMCA Outreach**

*A recent addition to the ACS-SA list of outreach activities, the YMCA outreach program is an effort to bring an afternoon of science to youth active in local YMCA chapters. Held at Chevron Science Center, the program targets those of elementary school age and is designed to give a fun, "hands on" introduction to the world of chemistry. Undergraduate students also perform some breathtaking demonstrations that are sure to capture the attention of the up and coming chemists. In addition to these activities, an effort is made by members to periodically visit to the YMCA locations where similar introductions to chemistry are held.*

*(continued on next page)*

## 2005-2006 ACS-SA Officers and Staff

**Chris LaRocca**-Co-President  
**Brendan Keeler**-Co-President  
**Nicole Zevola**-Vice-President  
**Erica Trimble**-Secretary  
**Lee Stunja**-Treasurer



**Josh Pierce**-Web Design

**Justin Chalker**-Outreach Coordinator  
**Neil Robertson**-Outreach Coordinator  
**Derek Miller**-Newsletter Editor  
**Liz Fidler**-Senior Affairs  
**Meredith McDermott**-Senior Affairs

CHEM  
MAJOR  
NEWS

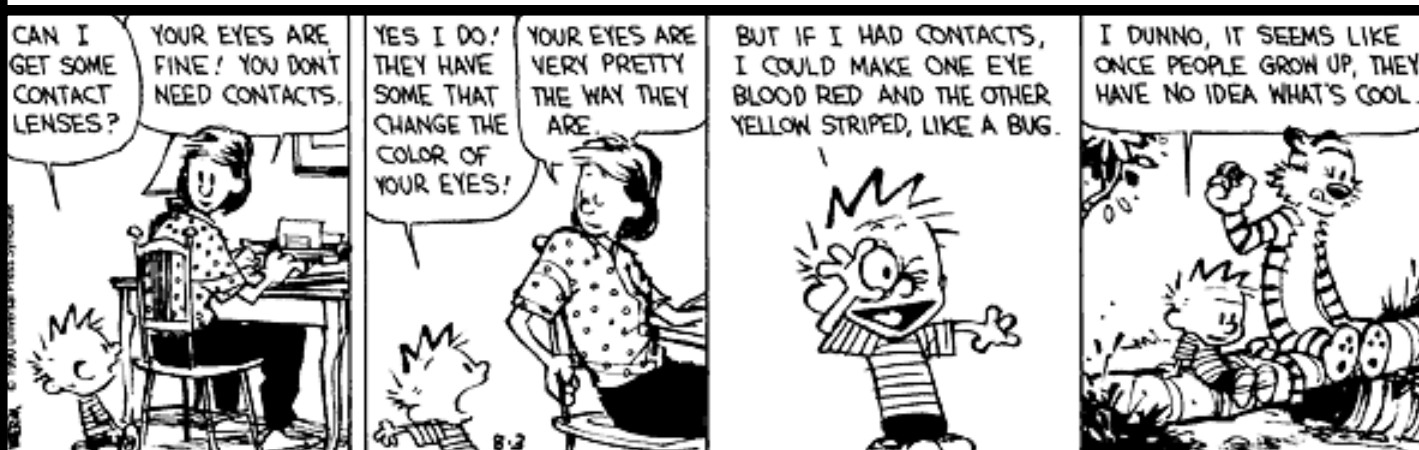
### **Number One-Attend the Meetings**

Each and every Friday in Chevron room 132, members of the ACS plus our faithful leader Dr. George Bandik gather together to enjoy each others company and to learn something new. Whether it is painting pumpkins on the patio in front of Chevron or having pizza and learning about the 12 Principles of Green Chemistry, when you are a member of the ACS you are assured of three things:

1. To make new friends if you put yourself out in the thick of it
2. To leave a meeting satisfied, both hunger and thirst wise
3. To make a difference in the life of someone else

I hope to meet each of you and see you on Friday at noon!

-- **Derek M. Miller**, Editor  
Chemistry Major News, University of Pittsburgh



The ACS-SA will be selling hoagies every Tuesday at lunchtime in the lobby of Chevron Science Center. This year they will be from Uncle Sam's! Details to follow soon....



**Enjoy!!!**



# Introduction to Green Chemistry

*This is the first in our new series on green chemistry written by our green chemistry editor Mark Ringenberg. Look for future green chemistry articles each month.*

I, like many of you, was never taught much about green chemistry except that some scientists are trying very hard to make chemistry cleaner. If you google “green chemistry” the first site that comes up is the Environmental Protection Agency (EPA). The EPA is an excellent introduction to the subject. The origins of green chemistry came from legislation done by the EPA. The Pollution Prevention Act of 1990 like any law is really dry and complicated to read; I tried reading it but dozed off by the third paragraph. However, the essence of the law is that we should no longer rely on “command and control”.<sup>1</sup> This means that instead of responding to environmental hazards as they happen, as responsible scientists we must move to prevent waste and destruction to the environment before it occurs. The EPA motivates scientist to go green through research grants, public private partnerships and the Presidential Green Chemistry Challenge Award. Since 1990 many new environmentally friendly processes and products have been created. However, the process of making chemistry greener as a whole is taking longer because chemistry has been done the same way for over a hundred years and it is very difficult to change something that is so well established.

Green chemistry is defined as the process of creating chemical products and reactions that reduce or eliminate the use and generation of hazardous materials.<sup>2</sup> The ultimate motivation is to address the global issues of climate change, energy production, availability of safe and adequate drinking water, food production, and the presence of toxic substances in the environment.<sup>3</sup> These ideas are being implemented throughout all fields of chemistry. A particularly interesting subject of current research is the use of benign solvents. The reason there is such an interest is that solvents are used in very high volume and many are toxic to humans and hazardous to the environment. A very interesting implementation of benign solvent is super critical CO<sub>2</sub>. For those of you who have not taken Physical Chemistry, a supercritical fluid occurs when you compress a gas at a certain temperature (T<sub>c</sub>) and pressure (P<sub>c</sub>) and it behaves like a liquid and a gas. The advantage to something like supercritical CO<sub>2</sub> is that it has the ability to behave like some organic solvents. The advantages of supercritical CO<sub>2</sub> is that it is nontoxic, nonflammable, inexpensive and can be separated from your product by altering the pressure. Imagine how much quicker O-Chem lab would be if instead of boiling off the diethyl ether all the time you just pop the lid off the reaction and the solvent just flies off leaving you with your product. The idea that chemistry does not have to be destructive to the environment or your body is an idea that many scientist are exploring in all fields of chemistry.

The current green issues that scientist are addressing in research today are too numerous for me to discuss all of them; however, one research project that I found particularly interesting is the use of visible light to split water into hydrogen and oxygen.<sup>4</sup> The practicality of this would allow the world to move away from a petroleum based economy to a hydrogen based economy. The reason that this is green chemistry is that the combustion of hydrogen produces only water as a waste product, which is completely benign as opposed to the combustion of hydrocarbons which has adverse effects on the environment. Sunlight, which is visible light, is free and environmentally friendly which means it really is free energy and the idea of the “Freedom” car might have some scientific basis. Only time will tell!

<sup>1</sup> [www.epa.gov/opptintr/p2home/p2policy/act1990.htm](http://www.epa.gov/opptintr/p2home/p2policy/act1990.htm)

<sup>2</sup> Paul T Anastas and Mary Kirchhoff, Origins, Current Status and Future Challenges of Green Chemistry, *Accounts of Chemical Research* Vol 35, No 9, 2002

<sup>3</sup> *ibid*

<sup>4</sup> Zou, Z; Ye, J; Sayama, K; Arakawa, H, Direct Splitting of Water Under Visible Light Irradiation with Oxide Semiconductor Photocatalyst, *Nature*, 2001, 414, 625-627

# A Great Resource on our Campus.

The Office of Career Services, 224 WPU, offers many valuable opportunities for students to explore career options. The following is a list of offerings for Fall 2005 (2061). To register for any of these programs call Career Services at 412-648-7130. Good Luck!!

## Fall 2005

<b>Date</b>	<b>Program</b>	<b>Room</b>	<b>Time</b>	<b>Presenter</b>
Tuesday, September 6	"The Medical School Interview"	310 WPU	4:00 - 5:00 pm	Ray Mizgorski
Tuesday, September 13	Pathway to Law School (1 of 3)	Provided upon registration	3:30 - 5:00 pm	TBA
Tuesday, September 20	Pathway to Law School (2 of 3)	Provided upon registration	3:30 - 5:00 pm	TBA
Wednesday, September 21	Emerging Leaders Kickoff Session	Provided upon registration	6:00 - 8:00 pm	Maureen Lazar
Thursday, September 22	Emerging Leaders Kickoff Session	Provided upon registration	6:00 - 8:00 pm	Maureen Lazar
Monday, September 26	"Careers for Liberal Arts Majors" (1 of 2)	310, WPU	4:00 - 5:30 pm	TBA
Tuesday, September 27	Pathway to Law School (3 of 3)	Provided upon registration	3:30 - 5:00 pm	TBA
Wednesday, September 28	"Careers for Liberal Arts Majors" (2 of 2)	310, WPU	4:00 - 5:30 pm	TBA
Monday, October 3	"Finding a Job Series" (1 of 2)	TBA	4:00 - 5:30 pm	TBA
Tuesday, October 4	"Networking to a Career"	540, WPU	4:00 - 5:30 pm	TBA
Tuesday, October 4	Discover Medicine	310, WPU	3:00 - 5:00	Ray Mizgorski

# Tentative ACS Fall Schedule

- September**
- 02 Welcome to the New Academic Year with Pizza
  - 09 Career Services-Just What Do They Do?
  - 16 Is Graduate School In Your Future?  
*with Dr. Joseph Grabowski*
  - 23 The Pre-Professional Career Path  
*with Mr. Ray Mizgorski*
  - 30 Towne Meeting on Graduate Education with Current Graduate Students.
- October**
- 07 Preparing for National Chemistry  
*with Justin and Neil*
  - 14 The Joys of Registration  
*with George C. Bandik*
  - 21 Pumpkin Painting and Fall Celebration on the Front Patio
  - 28 Biological Chemistry Here at Pitt  
*with Dr. Megan Spence*
- November**
- 04 Universitywide Scholarship Opportunities  
*with Ms. Amy Eckert, Director of National Scholarships and International Programming*
  - 11 Green Chemistry at PPG  
*with Dr. Rebecca Stiger, BS, Pitt 1992*
  - 18 Fall Term Awards Ceremony
  - 25 Thanksgiving Break--Enjoy!
- December**
- 02 Preparing for Saturday Science  
*with Justin*  
***This year Saturday Science will be held on December 3, 2005***
  - 09 Good Luck with Finals!  
NO MEETING



Wednesday, October 5	Pathway to Law School (1 of 3)	Provided upon registration	3:30 - 5:00 pm	TBA
Wednesday, October 5	"Finding a Job Series" (2 of 2)	TBA	4:00 - 5:30 pm	TBA
Tuesday, October 11	Discover Medicine (2 of 6)	310, WPU	3:00 - 5:00 pm	Ray Mizgorski
Tuesday, October 11	"Finding a Job Series" (1 of 2)	TBA	4:00 - 5:30 pm	TBA
Wednesday, October 12	Pathway to Law School (2 of 3)	Provided upon registration	3:30 - 5:00 pm	TBA
Wednesday, October 12	"Networking to a Career"	540, WPU	4:00 - 5:30 pm	TBA
Thursday, October 13	"Finding a Job Series" (2 of 2)	TBA	4:00 - 5:30 pm	TBA
Tuesday, October 18	Discover Medicine (3 of 6)	310, WPU	3:00 - 5:00 pm	Ray Mizgorski
Wednesday, October 19	Pathway to Law School (3 of 3)	Provided upon registration	3:30 - 5:00 pm	TBA
Tuesday, October 25	Discover Medicine (4 of 6)	310, WPU	3:00 - 5:00 pm	Ray Mizgorski
Tuesday, November 1	Discover Medicine (5 of 6)	310, WPU	3:00 - 5:00 pm	Ray Mizgorski
Tuesday, November 8	Discover Medicine (6 of 6)	310, WPU	3:00 - 5:00 pm	Ray Mizgorski
Tuesday, November 15	"Preparing Your Pre- Professional Committee File"	310, WPU	4:00 - 5:30 pm	Ray Mizgorski
Tuesday, November 15	"Careers in the Federal Government"	TBA	4:00 - 5:30 pm	TBA
Thursday, December 1	"Preparing for Creative Careers"	TBA	4:00 - 5:30 pm	TBA
Monday, December 5	"Preparing for Creative Careers"	TBA	4:00 - 5:30 pm	TBA