

# THE OCTAGON



Volume 89, No. 6, September 2006

Lehigh Valley Section of the American Chemical Society

## *In This Issue:*

September Meeting Announcement	1	Scholarship Announcement	2
Upcoming Meeting Schedule	1	This Month in Chemical History	2-4
LVACS Officers	1	News from National	4
May Meeting Minutes	2		

## *Meeting Announcement:*

### *789<sup>th</sup> LVACS Meeting:*

#### *Lafayette College*

Date: September 28, 2006

**Location:** Faculty Dining Room, Lafayette College

**Reception:** 5:30 PM -6:00 PM, Assorted cheese & crackers, soda

**Dinner:** 6:00 PM

**Meeting:** At the conclusion of dinner

**Talk:** At the conclusion of the meeting

**Menu:** Tossed Green Salad with Blue Cheese & Italian Dressing, Assorted Rolls & Butter, Crabcakes  
Grilled Flank Steak with a Whiskey Barbecue Sauce

Portobello & Spinach Ravioli with roasted tomato sauce (Vegetarian Option), Orzo & Wild mushroom herbs, Haricot Vert Green Beans, Dessert: Peanut Butter Pie

**Cost:** members \$25, students & retirees \$12.50

**Contact:** Debbie Bastinelli at (610) 330-5213 or [bastined@lafayette.edu](mailto:bastined@lafayette.edu) bu 9/21

**Directions:** on the web at <http://www.lafayette.edu/community/directions.html>

**Speaker:** Professor Jack Norton of Columbia University.

**Talk:** H• Transfer from Transition Metal Hydrides. Applications to Polymers and to Synthesis

Details will be published on the web at [www.esu.edu/lvacs](http://www.esu.edu/lvacs) as they become available.

### *2006-2007 Meeting Schedule*

October - TBA

November - Lehigh University

January - Muhlenberg College

February - Cedar Crest College

March - Desales University - HS Teacher's Night

April - Moravian College - Student Awards and Poster Session

May - East Stroudsburg University  
Pub Night Rescheduled!

### *LVACS Officers - 2006:*

**Chair:** T. Michelle Jones-Wilson  
East Stroudsburg University  
East Stroudsburg, PA 18301  
[mjwilson@po-box.esu.edu](mailto:mjwilson@po-box.esu.edu) 570-422-3703

**Chair Elect:** Paul Bouis  
[pbmbi@rcn.com](mailto:pbmbi@rcn.com)

**Immediate Past Chair:** Tara Baney  
Merck & Co., Inc. West Point, PA 19486  
[tara\\_baney@merck.com](mailto:tara_baney@merck.com) 215-652-7486

**Secretary:** Chester Crane  
Bangor PA  
[ccrane9@yahoo.com](mailto:ccrane9@yahoo.com) 610-588-0073

**Treasurer:** John Freeman  
East Stroudsburg University  
East Stroudsburg, PA 18301  
[jfreeman@po-box.esu.edu](mailto:jfreeman@po-box.esu.edu) 570-422-3446

**Councilor:** Carol Baker Libby  
Moravian College, Allentown, PA 18018  
[cblibby@cs.moravian.edu](mailto:cblibby@cs.moravian.edu) 610-861-1629

**Councilor:** Pamela D. Kistler  
Cedar Crest College, Allentown, PA 18104  
[pdkistle@cedarcrest.edu](mailto:pdkistle@cedarcrest.edu) 610-437-4471 x 3508

**Alternate-Councilors:** Roger Egolf & T. Michelle Jones-Wilson (see above)

---

### **May Meeting Minutes**

The 788<sup>th</sup> meeting of the Lehigh Valley Section of the American Chemical Society was held on May 12, 2006 at DeSales University. Chair T. Michelle Jones-Wilson called the meeting to order at 7:30 pm.

April minutes were approved as published in *The Octagon*. The website address lvacs.org has been purchased. All of the local section activities will be moved there sometime over the summer. A server has also been purchased so that the section will no longer require a university to maintain the website.

John Freeman introduced the winner of the Organic Scholarship based on the overall highest score, a prize of \$1000, and the best essay, with a prize of \$100. The winner was Danielle Duca, who had both the highest score and best essay. This is the fourth year in a row that the winner was from Lafayette College. Another student also had written an essay worthy of publication in *The Octagon*, and that individual will be recognized at the September meeting.

There was no other pending business for the Section.

Dr. Francis Mayville of DeSales University introduced the speaker for the evening, Dr. Guillermo Moyna of the University of the Sciences in Philadelphia. The title of his talk for the evening was “**Green Solvents Meet Green Bananas: Use of Ionic Liquids for the Processing and Analysis of Biomass**”. He discussed the use of ionic liquids to dissolve biomass materials such as cellulose and polysaccharides. This is very useful for examining the materials by solution NMR. Complete details of this topic and others that his research group are active in are available at his group website at: [http://tonga.usip.edu/gmoyna/research/research\\_frames.html](http://tonga.usip.edu/gmoyna/research/research_frames.html)

The meeting was adjourned at 8:36 pm by Paul Bouis.

Respectfully Submitted,  
Chester Crane, Secretary LVACS  
August 31, 2006

### **Organic Scholarship Winners**

The Lehigh Valley Section of the American Chemical Society's Scholarship for Organic Chemistry Competition took place on Saturday April 29, at Moravian College Bethlehem, PA, Collier Hall of Science Dana Lecture Hall (The competition entails taking the ACS Organic Chemistry Examination 50%), a letter of recommendation from the student's organic chemistry professor (10%), and an essay on a topic in organic chemistry (40%). The value of the

scholarship is \$1000. Additionally the top essay receives \$100.

This year's winner of the competition was Daniela Duca of Lafayette College Class of 2009.

Ms Duca came to Lafayette from Chisinau, Moldova and chose Lafayette for its small size and the ability of students to work directly with faculty. She performed research with Dr. William Miles over the summer and hopes to continue on in research with an ultimate goal of obtaining a Ph.D. in chemistry. She is also has interests in art and works in both pencil and acrylics. We are pleased to award the scholarship to Ms. Duca and look forward to following her progress. She also was awarded the best essay award for her essay on Polyphenols and wine, which you can read as a feature item on the section's website [www.esu.edu/lvacs](http://www.esu.edu/lvacs)

The competition will take place again in April 2009. We look forward to fine work from a new group of students.

### **This Month in Chemical History**

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

*Prepared for SCALACS, the Journal of the Southern California, Orange County, and San Gorgonio Sections of the American Chemical Society*

In early March 1896 Henri Becquerel made one of those seminal discoveries that change the whole face of science -- and of society. It was, to some degree, a serendipitous discovery, but Becquerel had the background, training, and genius to appreciate its significance, and he became the first investigator in a completely new area of science.

Henri Becquerel was born on December 15, 1852, into a distinguished family of scientists. His grandfather, Antoine Cesar Becquerel, was a pioneer student of electrical phenomena early in the nineteenth century, making important contributions to piezoelectricity, thermo-electricity, conductivity, and primary cells. Henri's father, Edmond Becquerel, became, at the age of 18, assistant to Antoine, and devoted his career to studies of both electricity and light. He was among the first to record, by photography, ultraviolet spectra -- in 1842!-- and devised a color photography system. He was a major investigator of phosphorescence phenomena, and this undoubtedly had its influence on his son's major discovery. In 1852, when Henri was born, his father Edmond had succeeded his father, Antoine, as Professor at the National Museum of Natural

History in Paris. So Henri grew up in the environs of a laboratory, and with his heritage he was predestined for a career in science. He studied at the Polytechnic School in Paris, and then studied engineering for three years, while serving in the Army Corps of Bridges and Roads. He became a Demonstrator at the Polytechnic School in 1875, and later, in 1895, became Professor at that School. In 1878, after his grandfather Antoine died, Henri took the position of Assistant at the museum where his father was Professor. Henri succeeded him in 1892. Henri was elected to the Academy of Sciences in 1889.

Henri Becquerel's first researches were on the Faraday effect, the interaction between light and magnetic fields. He established the effect in gases, and worked on empirical and theoretical relationships between field strength and the magnitude of the effect. He then started a more general study of magnetic phenomena in metals and gases. He also was an early student of infrared spectra, examining such spectra of the sun, metal vapors, water, and compounds of the lanthanide elements (the "rare earths"). In the early 1890's he returned to one of his father's themes, studying in more detail the phosphorescence of uranium salts, including some striking new observations of phosphorescence produced when certain minerals are heated.

In late 1895 Wilhelm Roentgen, Professor at Wurzburg, startled the scientific community with his announcement of the discovery of X-rays. The remarkable properties of this new form of radiation, including its ability to penetrate materials quite opaque to visible light, set off a flood of new investigative work. Henri Poincaré showed some of Roentgen's radiographs at a meeting of the Academy of Sciences in Paris in January 1896, and Becquerel was most interested in a reply to one of his questions, that the source of the X-rays might be the luminous spot on the wall of the cathode ray tube. Perhaps there was a connection between phosphorescence and X-rays? Becquerel told Poincaré that he would begin some experiments to test this idea.

On February 24, 1896, Becquerel described some initial experiments at a meeting of the Academy of Sciences, but the results were inconclusive. He then began new experiments using, as his phosphorescent material, potassium uranium sulphate, a salt which has a very strong phosphorescence. He placed the crystalline material on photographic plates wrapped in black paper, and put the assemblage in sunlight to excite the phosphorescence of the salt. After a few hours exposure he developed the plates and saw a faint impression of the crystals which had somehow penetrated the black paper. He seemed to be on the right track. More experiments were planned in late February, and

the plates with attached crystals were made up -- but the weather did not cooperate. The sun refused to shine, which is really not surprising for late February in Paris. Becquerel put the prepared plates away in a drawer for a few days and then, as a good scientist should, decided to treat these plates as controls. On March 1, 1896 he developed the plates expecting to find only very weak impressions. To his surprise the impressions were extremely strong; whatever was producing them was continuing to act in the dark of a laboratory drawer. Phosphorescence clearly had nothing to do with the phenomena Becquerel had observed. He had discovered a new kind of radiation which had no obvious excitational cause. He soon established that the new radiation was to be found in every uranium compound he examined, and he discovered a new detector for it. A charged gold-leaf electroscope was discharged by the action of this novel radiation -- but we might as well give it its recognized name. Becquerel had discovered radioactivity. His new electroscope detector was well-suited to quantitative measurements of the phenomenon. A young doctoral candidate at the School of Physics and Chemistry, Marie Sklodovska Curie, decided to follow up Becquerel's discoveries and use the electroscope to establish the fundamentals of radioactivity, with results that are surely well-known to all my readers.

Becquerel continued his studies on radioactivity in parallel with those of Marie Curie, who was later joined in her investigations by her husband, Pierre Curie. Becquerel and the Curies were jointly awarded the Nobel Prize in Physics in 1903 for their work on radioactivity, work which led to a complete revolution in our understanding of the nature of matter, and to a range of new products and industries, both beneficial and deadly.

#### **This Month in Chemical History: A Correction**

In a previous column I discussed the history of the term "photon" as it is currently used, attributing it to G.N. Lewis in a 1926 publication. A well-informed reader, Dr. Rodney Brooks of Wanaka, New Zealand, a retired physicist who is writing a book on Quantum Field Theory, has drawn to my attention the need to correct and amplify that column. He points out that Max Planck, in his Nobel Prize acceptance speech delivered in 1920 (for the prize in physics for 1918), used the word "photon" in its modern sense five times. I believe that speech was delivered in German. It was translated into English and also published in English but I have not yet traced the dates of the earliest publications. If I attach the proviso to my previous column that I was discussing the word 'photon' as it appeared in English then the column stands as essentially correct. A re-reading of the full Oxford English Dictionary (OED) confirms the history

of the word in English as I gave it.

That leaves us with two further puzzles. What is the origin of the German term “photon” that Planck used in 1920? Was it invented by Planck (the Nobel speech makes no mention of the word as a new term) or was it in general use in Germany at that time? Unfortunately the library sources I have at my disposal do not include a comprehensive dictionary of German on historical principles, a German analog of the OED. And was G.N. Lewis aware of Planck’s use of the term, somehow omitting reference to its prior use?

If any perceptive readers can help me with answers on either of these points I would appreciate hearing from them.

### ***News from National ACS***

#### **Nominating Procedure for ACS National Awards**

\* Nominations for 53 national awards administered by the ACS to be presented in 2008 are being solicited.

\* Forms for nominations and supporting information, and a detailed description of ACS national awards are available at <http://chemistry.org/awards>.

\* Any individual may submit a nomination for an award, unless that individual is a member of the selection committee for the same award. However, selection committee members may submit nominations for other awards.

\* Nominations and inquiries concerning awards should be directed to the Office of the Awards Programs, [awards@acs.org](mailto:awards@acs.org).

\* The deadline date for all nominating material for 2008 ACS National Awards is November 1, 2006. Earlier transmittal is encouraged.

#### **High School Chemistry Club for your local school?**

The High School office at ACS is interested in hearing from high school chemistry departments that might be interested in sponsoring ACS-Sponsored High School Chemistry Club. We would also like to speak to any local section members interested in helping an area high school establish an ACS-Sponsored High School Chemistry Club. Want to learn more? We would enjoy hearing from you at [education@acs.org](mailto:education@acs.org).

#### **NJ, PA, & ND Students Named to U.S. Chemistry Olympiad Team**

Four of the nation's top high school chemistry students — two from New Jersey, one each from North Dakota and Pennsylvania — have been chosen to represent the United States in the 38th annual International Chemistry Olympiad in Gyeongsan, Republic of Korea, July 2-11, 2006. They will compete with students from some 60 other countries in the event, sponsored by the American Chemical Society, the

world’s largest scientific society.

The four team members are:

Andrew Freddo, Colts Neck, N.J., Manalapan High School  
Alex Zozula, East Brunswick, N.J., East Brunswick High School,  
Michael Blaisse, Harrisburg, Pa., Bishop McDevitt High School,  
Greg Brockman, Grand Forks, N.D., Red River High School,  
Freddo and Blaisse were alternates to the team in 2005. The two alternatives are: Xiaoran (Taylor) Yi, San Diego, Calif., Westview High School,  
Sydney Creutz, Charlottesville, Va., Albemarle High School. “We’re very proud of the students selected for the U.S. team. We send them with high hopes, and are encouraged because they represent the future of chemistry and science – bright minds, collaborating to solve problems, willing to lead with innovation and new ideas,” said E. Ann Nalley, Ph.D., ACS President.

More than 10,000 high school students nationwide took local exams hoping to win a place on the Olympiad team. From those exams, twenty students were selected to participate at a June study camp, held at the U.S. Air Force Academy in Colorado. They received college-level training, with an emphasis on organic chemistry, through a series of lectures, problem-solving exercises, lab work and testing. The final team members and alternates were chosen from those attending the camp.

The International Chemistry Olympiad originated with Czechoslovakia, Poland and Hungary in 1968. Other eastern European countries soon joined the event, and Western Europe began participating in 1974. The first U.S. team competed in 1984, winning one silver and two bronze medals.

The American Chemical Society has sponsored the American team annually since the United States joined the Olympiad. Principal funding is through the Society’s Othmer Olympiad Endowment, with additional support from the U.S. Air Force Academy; IBM Research; Merck Publishing Group; Texas Instruments, Inc.; W.H. Freeman & Company; McGraw-Hill Companies, Inc.; Advanced Chemistry Development; Thomson, Brooks/Cole; Carolina Biological Supply Company; Flinn Scientific, Inc.; Fisher Scientific; Pearson Prentice Hall; Sigma Chemical Company; John Wiley & Sons, Inc.