# THE OCTAGON

Volume 88, No. 6, September 2005 Lehigh Valley Section of the American Chemical Society

## *In This Issue:*



## *Meeting Announcement:*

### *781st LVACS Meeting:*
### *Lafayette College*

**Date: Thursday September 22, 2005**
**Location:** Lafayette College
**Reception:** 5:30 PM Marlo Room - Farinon Center
**Dinner:** 6:00 PM Marlo Room - Farinon Center
**Meeting:** At conclusion of dinner, 103 Hugel Science Center
**Talk:** ~ 7:30 103 Hugel Science Center
**Menu:** Tossed green salad, rolls, choice of fresh Atlantic salmon seared with orange fennel beurre blanc sauce, grilled flank steak with whiskey barbecue sauce or roasted vegetable polenta; twice baked potato and green beans. Dessert: peanut butter pie
**Cost:** $22.50 members $12.00 students
**Contact:** Debbie Bastinelli at 610-330-5213 or bastined@lafayette.edu by Sept 15, 2005. Please include name affiliation and choice of entree.
**Directions:** Directions can be found on the web at http://www.lafayette.edu/community/directions.html

**Speaker:** Dr Hans Schelvis of New York University

**Talk:** DNA repair by photolyase: Better understanding through spectroscopy

**Look For LVACS on the web at www.esu.edu/lvacs**

## *Message from the Chair*

Greetings Fellow LVACS Members!
Tough to believe the summer is reaching its sunset for another year. As I'm sure for many of you, summer at work marks the time of Process Optimization Initiatives (do we REALLY know what POI means??), finding out SOPs that are not globalized all-of-a-sudden *need* to be globalized, and training all those new hires (not just the naive recent grads either!). Summer also means business planning for the fall; in my case we have plans out to 2010!!! No wonder the years move along so quickly ☺ For those who are lucky enough to have summer schedules (a WHOLE Friday afternoon off, wow……if no one catches you before you leave the building you're golden!), getting out of the office means catching up on all those home projects. Maybe a vacation? Very few in my department – hmmm, we'll all be gone at Christmastime! Use it or lose it, right? How true that is in SO many aspects……
Fall, the time of year for colorful foliage, cooler temperatures (hopefully) and the start of a new season of LVACS. Students will venture back to campus (or in my case start the intense work / school coordination again), and the first event we will encounter is our September meeting at Lafayette. We have not ventured to Lafayette in some time, so it will be a true pleasure to see the campus again. Soon afterwards the area academic institutions will embark on National Chemistry Week (October 16-22). The theme is Joy of Toys, and the LVACS is here to help. If you are from industry and would like to be a speaker at any of the area colleges/universities, please contact an Executive Committee member. The LVACS would like all the areas students to work together, use resources

efficiently, and bring NCW to a new level to build upon for years to come. Boy, does that sound like a POI or what???!!! ☺

Elections……those who have expressed interest, go ahead and make it official. Those who have been thinking about it internally just DO it – let us know; we'll help out. As I've stated in the past, the positions we have are Chair-Elect, Secretary, Treasurer, Councilors, and Alternate-Councilors. The by-laws describe on a high level what each position entails; however, the best way to find out is to ask those of us who have done it. How do we fit this into "life"? Do we like it? Why did we do this? Etc, etc, etc. I encourage anyone, from a first year member to a 50-year member, to consider running for an office.

Never hurts to repeat……As always, we are here and will listen to your thoughts, ideas, and action plans for our section. We have a truly great group of people, and we can learn and grow from one another. Think about what you want from this section, and how it can happen. Let's plan and do it, okay?

I look forward to seeing you, meeting you, and interacting with you.

Cheers,

Tara S. Baney, Chair

Email: tara_baney@merck.com Phone: 215-652-7486

***2005-2006 Tentative Meeting Schedule***

October - Kutztown University
November - Lehigh University
January - Cedar Crest College (Students' night)
February - Muhlenberg University
March - Albright
April - Moravian (Student Poster session)
May - DeSales (H.S. Teacher's night)

## *This Month in Chemical History*

Harold Goldwhite, California State University, Los Angeles hgoldwh@calstatela.edu

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

A few weeks ago, in casual conversation at a party, a regular reader of my column (Professor Harry Gray of the California Institute of Technology) challenged me with a history of science question. Did I know the origin of the term "photon" as used in physics and chemistry? I flunked abysmally! Thanks to the kindness of Professor Gray, who forwarded to me several relevant documents and citations, I am now much better informed on this topic. So I might say that this column is guest written by my generous informant. Of course I take full responsibility for all errors and omissions of fact or interpretation.

The word photon in its present sense was first applied to the quantum of electromagnetic radiant energy by none less than Gilbert N. Lewis, that great contributor to our modern views of electronic structure, acids and bases, thermodynamics, and many other areas, and head of the Chemistry department of the University of California at Berkeley, in a letter to the journal "Nature". The letter appears on pages 874 and 875 of the issue of December 18, 1926 (No. 2981, Vol. 118) and is titled "The Conservation of Photons."

While Max Planck invented the idea of the quantum of radiation as a purely formal device to explain the phenomena of black-body radiation in 1900, and Albert Einstein had applied this idea to explain the photoelectric effect in 1905, thus gaining for it the attention of the scientific community, they had referred to it as a light quantum. By 1926 the supporting evidence for this aspect of quantum theory was so strong that Lewis could write: " Indeed, we now have ample evidence that radiant energy (at least in the case of high frequencies) may be regarded as traveling in discrete units, each of which passes over a definite path in accordance with mechanical laws." The parenthetical proviso reminds us that perhaps the most convincing evidence for quantized radiation up to 1926 came from the observation of the Compton effect by Arthur Compton in 1923, which involved X-radiation.

Lewis went on much further than we would accept today with his views on light quanta.

" Had there not seemed to be insuperable objections, one might have been tempted to adopt the hypothesis that we are dealing here with a new type of atom, an identifiable entity, uncreatable and indestructible, which acts as the carrier of radiant energy and, after absorption, persists as an essential constituent of the absorbing atom until it is sent out again bearing a new amount of energy." So Lewis' view of the light

quantum is that it is a new kind of fundamental particle. “I therefore take the liberty of proposing for this hypothetical new atom, which is not light but plays an essential part in every process of radiation, the name photon.”

Lewis proposes six fundamental postulates for the properties of photons, of which I will just mention a couple. In any isolated system the number of photons is constant. All photons [like all electrons or all protons HG] are intrinsically identical. He then goes on to suggest that the thermodynamics of radiation (the origin of Planck’s invention of quantum theory) and the laws of spectroscopy lend substantial support to this view of the photon. And finally he proposes some new experiments to clarify the proposal: “ .. a molecular stream might be passed through the centre of a tube cooled to a very low temperature….in such circumstances … fluorescence or the emission of light from activated atoms, would be profoundly changed.”

Although the scientific world did not accept the extended views of Lewis on the nature of photons, the word was rapidly incorporated into scientific vocabulary. But this was a new use of a word apparently first coined (according to the authoritative Oxford English Dictionary) in 1916 by L. T. Troland to describe a unit of illumination of the retina, and it was still being used in this context as late as 1953. In 1921 J. Joly gave yet another meaning to the word. He proposed that the unit light stimulus discharged by a single visual fiber, which represents a very small amount of energy and must not be confused with the quantum of energy, should be called a photon. There are no subsequent citations for this use of the word,

So take care in your reading of early literature when you encounter the word photon. And make sure, when your friends ask you questions you cannot answer, that they help give you the information that will lead you to a fuller understanding.

### *Essay Contest/ Scholarship Announcement*

Submitted by Steve Weiner

The Lehigh Valley Section of the American Chemical Society (LVACS) is proud to sponsor the LVACS Senior Essay Award. The essay competition is open to undergraduate seniors who are majoring in chemistry, biochemistry, or chemical engineering at a college or university in the Lehigh Valley. The award is for $500 and will be presented to the student at the January meeting of the LVACS.

The requirement is for the student to write an essay on what excites him/her about chemistry and motivates him/her to pursue a career in the chemical sciences or chemical engineering? He/she may want to discuss how this relates this to his/her career goals.

The formatting of the essay should be 4 pages, double spaced, Times New Roman 12 point font, 1 inch margins top, bottom, and sides. Each page should have a header that includes the student’s name and page number. A title page should also be included with a title for the essay, the student’s name, the name of the school, and the student’s email address.

The essay should be submitted electronically no later than 5:00 p.m., Friday, October 28, 2005, attached as a Microsoft Word document to Dr. Steven Weiner, at steve.weiner@usbachem.com with “LVACS-Essay” in the subject line.

Please encourage your students to apply for this award. You may want to point out to your students that this essay could also serve as a writing sample that is often part of an application for many graduate and professional programs, or for a position in industry.

If you have any questions, feel free to contact Dr. Weiner at the above email address.

### *Question of the Month*

What common organic compound was first named “Dutch Oil”?

*Come to the September meeting for the answer!*

### *Mars is Coming!*

There has been some excitement circulating the Internet recently about a "Mars Spectacular" being closest to the Earth on Aug. 27 and be "as big as the full moon" in a "once in a lifetime event" that "no one alive will ever see again." This is a hoax that is NOT EXACTLY TRUE! Mars did come the closest to Earth on August 27 of 2003. Here are some of the facts for 2005:

* This year, Mars will come close to Earth again, but

not until October 30 at 11:19 p.m. EDT (pre-Halloween!)

* Mars will be 69 million kilometers from Earth (about 40 million miles - not the 36 million it was in 2003)

* To the unaided eye, Mars will look like a bright red star, a pinprick of light - certainly not as wide as the full Moon, even with binoculars or a small telescope.

* Brightness will be (in astronomy terms) magnitude -2.3 -- This will be the 4th brightest object in the sky after the Sun (-26.7), Moon (-12.6), and Venus (-4.4). [Quick astronomy lesson: a difference of 1 magnitude represents about 2.51 times difference in brightness - thus the difference in magnitude of 2.1 between Venus and Mars means that Venus is still ~7 times brighter than Mars!]

* Mars currently rises about 3 a.m. and is the brightest object in the eastern sky. Catch it before sunrise (in the morning twilight around 6 a.m.)! On October 30, Mars (located in the constellation Aries near Taurus) will rise at sunset and be out all night.

* To casual observers, Mars will seem about as bright and beautiful in 2005 as it was in 2003. It looks great now and will continue to look spectacular through the winter.

* It will make another close approach to Earth in Dec. 2007, so if you miss it during the next 8 months, wait until fall 2007!

More information about this hoax can be found at:
http://www.snopes.com/science/mars.asp
http://science.nasa.gov/headlines/y2005/07jul_marshoax.htm?list11930

## *News From National/Local Sections*

### *Call for Nominations: 2005 Buck-Whitney Award*

submitted by Chair ENYACS

The Eastern New York section of the American Chemical Society is soliciting nominations for the Buck-Whitney Medal to recognize original work in pure or applied chemistry. This award honors two of the section's deceased members, Johannes S. Buck, former Associate Research Director of the former Sterling-Winthrop Research Institute and, Willis R. Whitney, the first Director of the General Electric Research Laboratory. The nominee must have made outstanding contributions to chemistry and be a resident of North America. We are interested primarily in identifying a chemist whose work has not yet received a significant national or international award, and whose career will be advanced by such recognition. A bronze medal and citation, an honorarium of $1000, and a grant toward the travel expenses of the recipient to address our local section will be offered. The nominee's work can be in either experimental or theoretical aspects of any field of pure or applied chemistry. To nominate someone, please provide the nominee's name and affiliation and list the specific contributions of the nominee to chemistry, including a description of his or her accomplishments. Your nominations will be reviewed by the Awards Committee who will forward the name of the chosen candidate to the Chairman and Executive Committee of the Eastern New York Section for approval. Nominations for the Buck-Whitney Medal should be mailed by September 15, 2005 to: Buck-Whitney Award Committee, Department of Chemistry, Union College, Schenectady, NY 12308.

The Buck-Whitney Award is given by our local section, but the recipient can come from anywhere in North America. Past recipients of the Buck-Whitney Award have gone on to win further awards, even the Nobel Prize in Chemistry, as demonstrated in 1999 by Ahmed Zewail and in 2003 by Paul Lauterbur.

Questions about the Buck-Whitney Award should be addressed to Prof. Michael Hagerman, Chair of the ENYACS Awards Committee, at hagerman@union.edu

### *Richards Medal Nominations*

Submitted by Chuck Kolb

On behalf of the Northeastern Section of the American Chemical Society, I invite you to submit nominations for the 2006 Richards Medal. The Richards Medal honors the first U.S. Chemistry Nobel Laureate, and recognizes "conspicuous achievement" in any field of chemistry. It is presented every two years by the ACS/NES. Nominations for the 2006 Award must be submitted electronically by November 1, 2005. A pdf file describing the submission procedure is available on the section

### *Workshop Announced*

Submitted by Neil Jespersen, St. Johns University

Academic Careers in Chemistry Workshop Deadline

Sept 1, 2005

The Eastern Analytical Symposium and the National Science Foundation are sponsoring the fifth edition of our workshop entitled Academic Careers in Chemistry November 12-14, 2005. This workshop is designed to enhance the skills of new Ph.D. chemists in acquiring and
retaining academic appointments at Colleges and Universities suited to their skills and interests.

There are several distinguishing features of our workshop. First, we are NOT limited to analytical chemists, chemists from ALL areas are encouraged to attend, our faculty are similarly diverse. Our program covers all types of academic employment from small colleges to major research institutions and the faculty teaching this workshop come from the entire range of college types so that attendees receive immediate, first-hand information. We have a special evening session for the review of research proposals for those interested in research-intensive Universities. Critiques will be prepared by faculty members representing research universities. This workshop has received excellent reviews from those attending in the past. The workshop is free with the only expense being travel to Somerset New Jersey where the EAS is held. See the website for more information.

### *ACS Releases 2004 Annual Report*

The ACS Office of Communications is pleased to announce the release of the 2004 ACS Annual Report. Members are invited to view the enhanced web edition of the report online at http://chemistry.org/acsannualreport.

The enhanced web version of the report includes embedded links to the web sites of various Society programs, along with additional highlights of the Society's operational divisions.

In their combined officers' message for the report, ACS Board Chair Jim Burke, 2004 President Chuck Casey, and Executive Director & CEO Madeleine Jacobs write: "By their very nature, annual reports are a chance for reflection; an opportunity to look in the rearview mirror and assess how well we navigated the twists and turns and unexpected bumps in the highway over the past 12 months. But they also offer an opportunity to look ahead. Our 2004 annual report does both – it's a review, but with an eye toward the future."

This year's report, "Crossing Boundaries, Crossing Disciplines," focuses attention on the truly multi disciplinary nature of the chemical sciences. The report also spotlights four specific ACS programs that directly affect the lives of many individuals – ACS Scholars, Project SEED, Teacher Training, and the ACS Green Chemistry Institute.

Please take this opportunity to browse through the report and perhaps even share it with colleagues, relatives, friends and neighbors. It's a great way to provide them with some insight into what it means to belong to the world's largest scientific society.

The Office of Communications welcomes your questions, comments and feedback at annualreport@acs.org. Members may also request a printed copy of the 2004 ACS Annual Report by sending an email to **annualreport@acs.org.**

### *LVACS Officers - 2005:*

**Chair:** Tara Baney
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**Alternate-Councilor**s: Roger Egolf & T. Michelle Jones-Wilson (see above)