

THE OCTAGON



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Lehigh Valley Section of the American Chemical Society

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772nd LVACS Meeting:

DeSales University - High School Teacher's Night

Date: Friday, May 14, 2004

Location: Bishop McShea Student Center Social Hour and Dinner:

Reception: 5:15 PM to 6:15 PM (Assorted cheeses, strawberries, grapes, crackers, non-alcoholic champagne, and sodas)

Dinner: 6:15 PM Bishop McShea Student Center

Meeting: 7:30 PM Lecture Hall of Priscilla Payne Hurd Science Center

Talk: At conclusion of meeting - Lecture Hall of Priscilla Payne Hurd Science Center

Menu: (Buffet: Salad, baked ham, fish with fresh tomatoes and spinach garnish, chicken medallions, pasta, rice pilaf, fresh green beans, baby carrots with cinnamon butter, tarismu, chocolate cheese cake, strawberry shortcake, coffee and tea)

Cost: Members \$20.00; Students \$10.00. Retirees may attend meetings at half price. Should a retiree wish to pay full price the additional funds will be donated to the scholarship fund.

Contact: Mrs. Renee Fair (610 282-1100, Ext. 1386 or Renee.Fair@desales.edu: Deadline for dinner reservations, Tuesday, May 11 at 4:00 PM

Directions:

Directions to DeSales can be found on the web at <http://www.desales.edu/servlet/RetrievePage?site=Desalesu&page=aboutcardirections>. A campus map is available at <http://www.desales.edu/servlet/RetrievePage?site=desalesu&page=campustourstart>

Speaker: Dr. Katherine Ramsland, Professor of Psychology at DeSales University

Dr. Ramsland has published 22 books, including *The Criminal Mind*, *The Forensic Science of CSI*, and *The Unknown Darkness: Profiling the Predators Among Us*, with FBI profiler Gregg McCrary. Her forthcoming book, *The Science*

of Cold Case Files, offers an integrated history of forensic science as the context for the high tech methods in use today that are closing cases once thought unsolvable. She writes for Court TV's Crime Library Web site on subjects ranging from serial killers to forensic psychology to forensic science, and she has appeared on various documentaries about forensic issues. With a Ph.D. in Philosophy from Rutgers University, a master's in Forensic Psychology from John Jay College of Criminal Justice, and a master's in Clinical Psychology from Duquesne University, her current scholarly focus is on forensic aspects of death investigation and on the psychology of multicide.

Talk: Forensics, Chemistry, and Crime

Abstract: Chemistry was among the first sciences to be offered as evidence in a criminal trial. From sensational murder cases during the nineteenth century to high profile trials today, the areas of chemistry and forensics have each contributed to refinements in the other, launching a vital dialectic of scientific challenge, new ideas, improved methods, and demonstrable proofs. Science made trials fairer and trials made science more accountable. Dr. Katherine Ramsland, professor of forensic psychology at DeSales University, will discuss criminal trials from the history of forensic science that demonstrated the improvements to both disciplines in vivid and compelling ways.



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

April Meeting Minutes

Moravian College and the LVACS co-hosted an Undergraduate Research Poster Session, which started at 5:00PM and ended at 6:15PM, just prior to the LVACS dinner. There were 18 posters presented and the students did an excellent job putting them together and presenting them to the attendees. The 771th meeting of the LVACS was called to order by Chair Dr. Steve Weiner at 7:05 PM on Thursday, April 22, 2004.

Steve started off by honoring a 50 year member of the ACS, Dr. Harold Locke. Dr. Locke was presented with a certificate honoring him for this achievement. Next, Steve asked Dr. Locke to draw names for the winner and runner-up of the LVACS Travel Award from those that presented posters that evening. The winner was Taylor Robinson with the runner-up being Jessica Whitman. Taylor will receive a \$250 travel award, meal allowance, registration expense and mileage reimbursement (if driving) to attend and present her research at a regional or national ACS or American Chemical Engineering Society (AChE) meeting. If Taylor is unable to meet the requirements of the award then it will be given to the runner-up.

Dr. Pam Kistler provided an update on the National ACS decision regarding the status of the AChE. The National ACS will not assume the debt and will not make the AChE a division of the ACS.

Just prior to the evening talk, Steve had representatives introduce the students from their institution that would be recognized for their academic achievements by being awarded a Merck Index. The recipients are listed below:

Lehigh Valley Section A.C.S. AWARDS – 2004

| <u>School</u> | <u>Awardee</u> |
|--------------------------------|-----------------------|
| Albright College | Nicole Ann Reed |
| Alvernia College | Jonathan Ross |
| Cedar Crest College | Gabrielle Boulерice |
| | Jacquelyn R. Lagerman |
| DeSales University | and |
| | James F. Cuff, III |
| East Stroudsburg University | Vesna Vodlan |
| Kutztown University | Trish Geist |
| Lafayette College (chem.) | Katelyn Connell |
| Lafayette College (chem. eng.) | Jessica Hronich |
| Lehigh University (chem.) | Adam Baughman |
| Lehigh University (chem. eng.) | Justin Federici |
| Moravian College | Mark Schlegel |
| Muhlenberg College | Deanna Howarth |

The question of the month was asked next: “Who designed the Bunsen Burner?” The answer is Peter Desaga.

The speaker for the evening was Dr. Michael Cann, and the title of his presentation was “Pollution Prevention: A Paradigm Addressed Through Green Chemistry”¹. Dr. Cann started his talk by discussing all the good things chemists made such as drugs, plastics, etc. Then he discussed the environmental disasters that became rallying points for legislation. In a graphic shown by Dr. Cann, it was apparent that there has been a significant, exponential increase in new environmental legislation after 1970. Until 1990, the legislation concentrated on “end of the pipe solutions” or “command and control” laws, all of which added cost to industry. The first legislation focusing on prevention occurred with the “Pollution Prevention Act of 1990”.

Next, Dr. Cann discussed “what is green chemistry?” It is to minimize waste, energy use and resource use. He also discussed the 12 principles of green chemistry. Every year 28-35 million pounds of Ibuprofen is produced along with 37-46 million pounds of waste. Then he gave examples of green chemistry where the number of steps and chemicals needed to complete a reaction to develop a drug such as Ibuprofen were significantly reduced. Next, the concept of “Atom Economy” was presented and Dr. Cann stressed that this should be looked at in conjunction with yield in chemical reactions.

% Atom Economy = (F.W. Atoms Utilized / F.W. of All Reactants) x 100%.

Green chemistry also saves money for manufacturers by reducing steps and the associated costs. Dr. Cann also presented the concept of the “triple bottom line”, which is “green chemistry offers potential for environmental, economic and social benefits”. Dr. Cann ended by offering free publications to the audience who might be interested in incorporating green chemistry in their chemistry courses.

¹Secretary’s Note: Additional information on Green Chemistry can be found at Dr. Cann’s website at the following web link:

<http://academic.scranton.edu/faculty/CANNM1/greenchemistry.html>

Respectfully Submitted,

David C. Skee, Secretary, LVACS April 24, 2004

227th National Meeting Highlights



More than 8,000 research papers were presented at the ACS national meeting in Anaheim, CA, March 28 to April 1, 2004. In addition, the largest ever ACS exhibition on the West Coast was held, with nearly 500 booths. Just over 13,000 scientists and exhibitors attended the meeting!

A general theme of the meeting, nanotechnology, was reflected in several presidential sessions, sponsored by ACS President Charles P. Casey. Casey sponsored events such as “Big Promise from Small Science: How Nanotechnology Will change Our Lives,” “Commercial Applications of

Nanotechnology,” and “Working in Nanotechnology: What Does It Take?”

In governance actions, the ACS Council voted to raise dues for 2005 to the fully escalated rate of \$123. Also, at the Council meeting four candidates for 2005 president-elect—Edward M. Eyring, University of Utah; F. Sherwood Rowland, University of California, Irvine; Gary B. Schuster, Georgia Institute of Technology; and Isiah M. Warner, Louisiana State University—were introduced and gave short presentations. The council selected Rowland and Warner as candidates for 2005 president-elect. After announcing the results of the council election, Committee on Nominations & Elections Chair Valerie J. Kuck also announced that E. Ann Nalley, Cameron University, had been certified as a petition candidate for 2005 president-elect.

At the ACS Awards Dinner, Elias J. Corey, Harvard University’s Sheldon Emery Professor of Chemistry, was presented with the 2004 Priestley Medal. Sandra C. Greer, a professor of chemistry and chemical engineering at the University of Maryland, College Park, won the 2004 Francis P. Garvan-John M. Olin Medal and Zaida C. Morales-Martinez was presented with the 2004 ACS Award for Encouraging Disadvantaged Students into Careers in the Chemical Sciences. Additionally Sonja Israel accepted the first Stanley C. Israel Regional Award for Advancing Diversity in the Chemical Sciences on behalf of her late husband, Stanley C. Israel.

The Committee on Local Section Activities (LSAC) met during the meeting and announced that five local sections are celebrating significant anniversaries in 2004: Eastern North Carolina, Indiana-Kentucky Border & Santa Clara Valley (50 years); Wichita (75 years); and the Georgia local section (100 years).

LSAC voted to discontinue the ChemLuminary Award for “Most Innovative Use of Technology”. LSAC reviewed the 2004-06 ACS Strategic Plan and is working to align the local section annual report form with the plan. LSAC also engaged in discussions concerning the three areas for proposed cooperative action with the American Institute of Chemical Engineers (AIChE). LSAC voted to support continued discussions with AIChE.

Martha Lester

Assistant Director,

Department of Local Section and Community Activities

LVACS Officers - 2004:

Chair: Steve Weiner

Chemistry Department, Muhlenberg College
2400 Chew Street, Allentown, PA 18104

sweiner@muhlb.org 484-664-3665

Chair Elect: Tara Baney

Merck & Co., Inc. West Point, PA 19486
tara_baney@merck.com 215-652-7486

Immediate Past Chair: Paul Bouis

Mallinckrodt Baker Inc., Phillipsburg, NJ 08865

paul.bouis@tycohealthcare.com 908-859-9443

Secretary: David C. Skee

Mallinckrodt Baker Inc., Phillipsburg, NJ 08865

david.skee@tycohealthcare.com

Treasurer: John Freeman

522 Raub St., Easton PA 18042

jcf2@rcn.com 610-923-3587

Councilor: Carol Baker Libby

Moravian College, Allentown, PA 18018

cblibby@cs.moravian.edu 610-861-1629

Councilor: Pamela D. Kistler

Cedar Crest College, Allentown, PA 18104

pdkistler@cedarcrest.edu 610-437-4471 x
3507

Alternate-Councilor: Roger Egolf

Penn State LV Campus, Allentown, PA 18051

rae4@psu.edu 610-285-5110

Alternate-Councilor

(Octagon Editor & Webmaster):

T-Michelle Jones-Wilson

East Stroudsburg University

East Stroudsburg, PA 18301

mjwilson@po-box.esu.edu 570-422-3446

physical chemists that Nernst began his important researches.

In 1894 he received invitations to the Physics Chairs in Munich and in Berlin, as well as to the Physical Chemistry Chair in Göttingen. He accepted this latter invitation, and in Göttingen founded the Institute for Physical Chemistry and Electrochemistry and became its Director. In 1905 he was appointed Professor of Chemistry, later of Physics, in the University of Berlin, becoming Director of the newly-founded "Physikalisch-Chemisches Institut" in 1924. He remained in this position until his retirement in 1933.

Nernst's early studies in electrochemistry were inspired by Arrhenius' dissociation theory which first recognized the importance of ions in solution. In 1889 he elucidated the theory of galvanic cells by assuming an "electrolytic pressure of dissolution" which forces ions from electrodes into solution and which was opposed to the osmotic pressure of the dissolved ions. In the same year he derived equations which defined the conditions by which solids precipitate from saturated solutions. His heat theorem, known as the Third Law of Thermodynamics, was developed in 1906. It demonstrated that the maximum work obtainable from a process could be calculated from the heat evolved at temperatures close to absolute zero - earlier ideas had not considered the effects of temperature - and conditions of equilibrium in many chemical reactions could now be precisely worked out. In addition to its theoretical implications, the theorem was soon applied to industrial problems, including calculations in ammonia synthesis.

Nernst and his students in Berlin proceeded to make many important physico-chemical measurements, particularly determinations of specific heats of solids at very low temperatures and of vapour densities at high temperatures. All these were considered from the point of view of quantum theory.

In 1918 his studies of photochemistry led him to his atom chain reaction theory. This assumed that once the energy of a quantum has initiated a reaction in which free atoms are formed, these formed atoms can themselves decompose other molecules with the liberation of more free atoms and so on. The reaction can thus continue for long periods without further outside initiations.

Nernst was mechanically minded and he was always to the forefront in considering ways of applying the results of scientific research to industry. His improved electric light, the Nernst Lamp, used a ceramic body and it might have assumed importance had not tantalum and tungsten filaments been developed. His electrical piano, which replaced the sounding board with radio amplifiers, did not

A Nobel Biography - Nernst



Walther Hermann Nernst was born in Briesen, West Prussia, on June 25, 1864. His father, Gustav Nernst, was a district judge. He spent his early school years at Graudentz, and subsequently went to the Universities of Zurich, Berlin and Graz (Ludwig Boltzmann and Albert von Ettinghausen), studying physics and mathematics, before proceeding to Wurzburg (Friedrich Kohlrausch), where he graduated in 1887 with a thesis on electromotive forces produced by magnetism in heated metal plates. He joined Wilhelm Ostwald at Leipzig University, where van 't Hoff and Arrhenius were already established, and it was in this distinguished company of

gain acceptance among musicians. In later years, he occupied himself with astrophysical theories, a field in which the heat theorem had important applications. For his work in thermochemistry he received the Nobel Prize in Chemistry for 1920. Many other distinctions and awards were bestowed upon him for his contributions to science. Walther Nernst's fundamental contributions to electrochemistry, the theory of solutions, thermodynamics, solid state chemistry and photochemistry are recorded in a series of monographs, and in his many papers to learned societies, etc. His book *Theoretische Chemie vom Standpunkte der Avogadro'schen Regel und der Thermodynamik* (Theoretical chemistry from the standpoint of Avogadro's rule and thermodynamics) was first published in 1893 and the tenth edition appeared in 1921 (the fifth English edition in 1923). Together with A. Schonflies he wrote a textbook *Einführung in die mathematische Behandlung der Naturwissenschaften* (Introduction to the mathematical study of the natural sciences), which reached its tenth edition in 1923. Of his other books, his monograph *Die theoretischen und experimentellen Grundlagen des neuen Wärmesatzes* (1918, second edition 1923) was also published in English (*The New Heat Theorem*, 1926).

Nernst married Emma Lohmeyer in 1892. They had two sons, who were both killed in the First World War, and three daughters. His favorite pastimes were hunting and fishing. He died in Berlin on November 18, 1941. *From Nobel Lectures, Chemistry 1901-1921, Elsevier Publishing Company, Amsterdam, 1966*

13 Reasons to be a Chemist

- All the coffee and pocket protectors you could want!
- Clark Kent style safety glasses.
- Because it's pHun :)
- Access to 100% pure ethanol
- Knowing how to completely dissolve the bodies of your enemies
- You never have to worry about what you're doing on Friday night-(You're working in the lab)
- Permanent goggle marks are cheaper than a tattoo.
- You hope someday to be able to use the word "buckyballs" without bursting into a fit of laughter.
- You wish to be blamed for all faults in the environment.
- ditto for cancer
- You are adept at poverty cooking
- You prefer to get your course credits the hard way

Chemistry Question of the Month

Where did Seaborg announce the discovery of elements 95 and 96?

Come to the May meeting for the Answer

Advertising/Article Policy

All articles of interest to LVACS members including local news and meeting details will be printed on a priority basis over ad copy. All ads for job openings and seminars with free admission of interest to LVACS members will be printed free as space is available. All ads for goods or services available at a cost will be printed for a fee. Please contact the editor for the fee structure. The editor reserves the right to reject inappropriate copy. All article copy must be submitted 5 weeks prior to the meeting date. Electronic format (ms word, word perfect email or simple text) is preferred but not required. Information can be emailed, posted or faxed to the editor. Images can be submitted electronically in either gif, jpg, tiff, or bmp format. Images submitted as hardcopy may be scanned and compressed for insertion. The editor reserves the right to make minor changes to copy in the interest of space prior to publication. Significant changes will be communicated to the author before print.

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Please address all correspondence concerning this publication to the editor.

T. Michelle Jones-Wilson
East Stroudsburg University
Dept. of Chemistry
200 Prospect Street
East Stroudsburg, PA 18301
Phone: 570-422-3446
Email: mjwilson@po-box.esu.edu
Fax: 570-422-3908

Applications for membership in the American Chemical Society should be sent to the LVACS Secretary. This publication, founded in 1918 is devoted to the interests of the Lehigh Valley Section of the American Chemical Society. It is published eight times each year (January through May and September through November) and provided free to members of the local section: subscription fee to non