

THE OCTAGON



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Lehigh Valley Section of the American Chemical Society

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Meeting Announcement:

783rd LVACS Meeting: Lehigh University - Spouse's Night -

Date: Wednesday, November 16, 2005

Location: Lehigh University

Reception: 5:45 - 6:30 pm - 3rd Floor Lehigh University Packer Center (Student Union Bldg)

Dinner: 6:30 pm - Asa Packer Dining Room

Meeting: 7:45 pm - Asa Packer Dining Room

Talk: ~ 8:00 pm - Asa Packer Dining Room

Menu: Buffet -garden Salad with choice of bleu cheese or balsamic vinaigrette dressing, maple whiskey glazed chicken Yankee pot roast, roasted vegetables and provolone lattice pastry baked potato with sour cream, butter and chives, broccoli, cauliflower, and mini-peeled carrots in herbed butter, old fashioned apple pie, coffee, tea, assortment of beverages

Cost: \$22.50 per member ; \$12.00 students and spouses

Contact: Please make reservations before 4:00 pm on Friday, November 11 by e-mail to Marilyn Burgess <mn3@lehigh.edu> or by phone at (610) 758-3471.

Directions: Directions and campus map on the web at: <http://www3.lehigh.edu/about/lumapsdirections.asp>

Speaker:

David B. Small, Lehigh University

David B. Small is a Professor of Anthropology and Sociology at Lehigh University (since 1987).

He holds a B.A. from SUNY (Albany) (1973); an M.A. (1977); and a Ph.D. from Cambridge University (1983). David has published on issues of complex evolution, architecture and society, and mortuary analysis. He is currently the Director of Lehigh University's Archaeological Excavations at Rancho del Rio, Honduras.

Talk:

Phosphate Analysis and the Revolution in Domestic Archaeology

Archeologists have long made use of Chemistry in unraveling the history of ancient civilizations. The use of radiocarbon and argon dating is well known in chemical archeology but the inclusion of simple phosphate testing of soil matrixes within household compounds has also added a tremendous window into our view of past residential behavior. Work at Teotihuacan and more recently, at El Coyote in Honduras have established phosphate testing as a reliable method to determine past behaviors in a number of contexts. This talk will review the impact of phosphate analysis in Mesoamerican research and outline how such analyses currently direct Lehigh University's archaeological research in Honduras.

2005-2006 Tentative Meeting Schedule

January - Cedar Crest College (Students' Night)
February 22 - Muhlenberg University
March - Albright
April - Moravian (Student Poster session)
May - DeSales (H.S. Teacher's night)



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

Report from the Council Meeting

Washington, DC, August 30, 2005

The ACS Board of Directors has appointed a Joint Task Force on Governance Review. This task force is conducting a review of the governance structure of the ACS to determine the best organizational framework for fulfilling the mission of the Society and meeting member needs.

The Board of Directors has also announced a two-year pilot program for establishing and supporting ACS High School Chemistry Clubs. In addition, the Society will continue to support the Green Chemistry Institute and Project SEED. To mark the 25th anniversary of Project SEED, the Council was given a summary of the many successes of former participants, including a Rhodes Scholar.

The Board of Trustees has voted to designate the site of the Rumford Baking Powder Company as a national historic chemical landmark.

The ACS website will be re-evaluated to make it easier to use.

The Council participated in a special discussion on the Society's vision of the future of Chemistry. During the national meeting, members were asked to describe their view of the future. Several common themes were identified: diversity, young people, governance, multi-disciplinarity, globalization, and outreach.

The ACS Committee on Nominations and Elections is continuing its consideration of electronic balloting methods.

Prepared 9/22/05 by:

Dr. Pamela D. Kistler



American Chemical Society Meeting & Exposition

March 26 - 30, 2006

Atlanta, GA USA

Did you know ACS has a website for kids and chemistry?

<http://acswebcontent.acs.org/kids/index.html>



LVACS Officers - 2005:

Chair: Tara Baney

Merck & Co., Inc. West Point, PA 19486

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Chair Elect: T. Michelle Jones-Wilson

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Treasurer: Roger Egolf

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Councilor: Carol Baker Libby

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Councilor: Pamela D. Kistler

Cedar Crest College, Allentown, PA 18104

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

Octagon Editor & Webmaster

Question of the Month

What Hungarian born Nobel prize winning chemist convinced his wife to seek a degree in chemistry and work in his laboratory?

Come to the November meeting for the answer!

Ballot

Elections for 2006 Officers of the Lehigh Valley Section of the American Chemical Society

Please choose **one** candidate for each office.

Please cut or photocopy the ballot from your newsletter. Email subscribers - please print this page of your newsletter.

Chair Elect

_____ Paul Bouis

Treasurer

_____ John Freeman

Secretary

_____ Chester Crane

Councilor

_____ Roger Egolf

_____ Pamela Kistler

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Please carefully follow these instructions for voting :

1. After indicating your choice, seal your ballot in a plain envelope. Write the word BALLOT on the envelope. Sign or initial the seal.
2. Fold the envelope and insert in another envelope, affix appropriate postage and return address, address to:

T. Michelle Jones-Wilson
LVACS
RR #1 Box 1077
Cresco, PA 18326

Deadline - envelopes must be postmarked no later than November 25, 2005.

Ballots will also be accepted at the November meeting.

Your Vote Counts! Let your voice be heard!

Famous Husband and Wife Scientist Teams

1903 Nobel Prize in Physics - Antoine Henri Becquerel, Pierre Curie & Marie Curie*

1935 Nobel Prize in Chemistry - Frédéric Joliot, Irène Joliot-Curie

* Marie Curie was also awarded the 1911 Nobel Prize in Chemistry



Irène Joliot-Curie – Biography

Irène Curie, born in Paris, September 12, 1897, was the daughter of Pierre and Marie Curie, and since 1926 the wife of Frédéric Joliot. After having started her studies at the Faculty of Science in Paris, she served as a nurse radiographer during the First World War. She became Doctor of Science in 1925, having prepared a thesis on the alpha rays of polonium. Either alone or in collaboration with her husband, she did important work on natural and artificial radioactivity, transmutation of elements, and nuclear physics; she shared the Nobel Prize in Chemistry for 1935 with him, in recognition of their synthesis of new radioactive elements, which work has been summarized in their joint paper *Production artificielle d'éléments radioactifs. Preuve chimique de la transmutation des éléments* (1934). In 1938 her research on the action of neutrons on the heavy elements, was an important step in the discovery of uranium fission. Appointed lecturer in 1932, she became Professor in the Faculty of Science in Paris in 1937, and afterwards Director of the Radium Institute in 1946. Being a Commissioner for Atomic Energy for six years, Irène took part in its creation and in the construction of the first French atomic pile (1948). She was concerned in the inauguration of the large centre for nuclear physics at Orsay for which she worked out the plans. This centre was equipped with a synchro-cyclotron of 160 MeV, and its construction was continued after her death by F. Joliot. She took a keen interest in the social and intellectual advancement of women; she was a member of the Comité National de l'Union des Femmes Françaises and of the World Peace Council. In 1936 Irène Joliot-Curie was appointed Undersecretary of State for Scientific Research. She was a member of several foreign academies and of numerous scientific societies, had honorary doctor's degrees of several universities, and was an Officer of the Legion of Honour. She died in Paris in 1956. Jean Frédéric and Irene Joliot-Curie had one daughter, Helene, and one son, Pierre. Irène Joliot-Curie died on March 17, 1956.



Frédéric Joliot – Biography

Jean Frédéric Joliot, born in Paris, March 19, 1900, was a graduate of the Ecole de Physique et Chimie of the city of Paris. His father was Henri Joliot, a merchant, and his mother was Emilie Roederer. In 1925 he became, at the Radium Institute, assistant to Marie Curie, whose daughter Irène he married in 1926. He obtained his Doctor of Science degree in 1930, having prepared a thesis on the electrochemistry of radio-elements, and became lecturer in the Paris Faculty of Science in 1935. At this time he carried out considerable research on the structure of the atom, generally in collaboration with his wife, Irène Joliot-Curie. In particular they worked on the projection of nuclei, which was an essential step in the discovery of the neutron (Chadwick, 1932) and the positron (Anderson, 1932). However, their greatest discovery was artificial radioactivity (1934). By bombardment of boron, aluminium, and magnesium with alpha particles, they produced the isotope 13 of nitrogen, the isotope 30 of phosphorus and, simultaneously, the isotopes 27 of silicon and 28 of aluminium. These elements, not found naturally, decompose spontaneously, with a more or less long period, by emission of positive or negative electrons. It was for this very important discovery that these two physicists received in 1935 the Nobel Prize for Chemistry. During this time F. Joliot, who had always taken an interest in social questions, joined the Socialist Party, the S.F.I.O. (1934), then the League for the Rights of Man (1936)

In 1937 he was nominated Professor at the Collège de France. He left the Radium Institute and had built for his new laboratory of nuclear chemistry the first cyclotron in Western Europe. After the discovery of the fission of the uranium nucleus, he produced a physical roof of the phenomenon; then with Hans Halban and Lev Kowarski, joined by Francis Perrin, he worked on chain reactions and the requirements for the successful construction of an atomic pile using uranium and heavy water; five patents were taken out in 1939 and 1940. On the advance of the German forces (1940), F. Joliot managed to get the documents and materials relating to this work transported to England. During the French occupation he took an active part in the Resistance; he was President of the National Front and formed the French Communist Party. After having been Director of the Centre National de la Recherche Scientifique (1945), he became the first High Commissioner for Atomic Energy (1946); he directed the construction of the first French atomic pile (1948). He was relieved of his duties in 1950 for political reasons. While still retaining the control of his laboratories, F. Joliot-Curie took a considerable part in politics and was elected President of the World Peace Council. On the death of Irene Joliot-Curie, in 1956, he became, while still retaining his professorship at the Collège de France, holder of the Chair of Nuclear Physics which she had held at the Sorbonne.

F. Joliot was a member of the French Academy of Sciences and of the Academy of Medicine. He was also a member of numerous foreign scientific academies and societies, and holder of an honorary doctor's degree of several universities. He was a Commander of the Legion of Honour. His recreations show him as a man of wide attainments, among which piano playing, landscape painting and reading (particularly Kipling), were predominant.

Joliot devoted the last two years of his life to the inauguration and development of a large centre for nuclear physics at Orsay. He died in Paris in 1958. Frédéric Joliot died on August 14, 1958.

Joliot and Joliot-Curie From Nobel Lectures, Chemistry 1922-1941, Elsevier Publishing Company, Amsterdam, 1966



Pierre Curie – Biography

Pierre Curie was born in Paris, where his father was a general medical practitioner, on May 15, 1859. He received his early education at home before entering the Faculty of Sciences at the Sorbonne. He gained his Licenciateship in Physics in 1878 and continued as a demonstrator in the physics laboratory until 1882 when he was placed in charge of all practical work in the Physics and Industrial Chemistry Schools. In 1895 he obtained his Doctor of Science degree and was appointed Professor of Physics. He was promoted to Professor in the Faculty of Sciences in 1900, and in 1904 he became Titular Professor. In his early studies on crystallography, together with his brother Jacques, Curie discovered piezoelectric effects. Later, he advanced theories of symmetry with regard to certain physical phenomena and turned his attention to magnetism. He showed that the magnetic

properties of a given substance change at a certain temperature - this temperature is now known as the Curie point. To assist in his experiments he constructed several delicate pieces of apparatus - balances, electrometers, piezoelectric crystals, etc.

Curie's studies of radioactive substances were made together with his wife, whom he married in 1895. They were achieved under conditions of much hardship - barely adequate laboratory facilities and under the stress of having to do much teaching in order to earn their livelihood. They announced the discovery of radium and polonium by fractionation of pitchblende in 1898 and later they did much to elucidate the properties of radium and its transformation products. Their work in this era formed the basis for much of the subsequent research in nuclear physics and chemistry. Together they were awarded half of the Nobel Prize for Physics in 1903 on account of their study into the spontaneous radiation discovered by Becquerel, who was awarded the other half of the Prize. Pierre Curie's work is recorded in numerous publications in the *Comptes Rendus de l'Académie des Sciences*, the *Journal de Physique* and the *Annales de Physique et Chimie*. Curie was awarded the Davy Medal of the Royal Society of London in 1903 (jointly with his wife) and in 1905 he was elected to the Academy of Sciences.

His wife was formerly Marie Sklodowska, daughter of a secondary-school teacher at Warsaw, Poland. One daughter, Irene, married Frederic Joliot and they were joint recipients of the Nobel Prize for Chemistry in 1935. The younger daughter, Eve, married the American diplomat H. R. Labouisse. They have both taken lively interest in social problems, and as Director of the United Nations' Children's Fund he received on its behalf the Nobel Peace Prize in Oslo in 1965. She is the author of a famous biography of her mother, *Madame Curie* (Gallimard, Paris, 1938), translated into several languages. Pierre was killed in a street accident in Paris on April 19, 1906.



Marie Curie – Biography

Marie Curie, née Maria Sklodowska, was born in Warsaw on November 7, 1867, the daughter of a secondary-school teacher. She received a general education in local schools and some scientific training from her father. She became involved in a students' revolutionary organization and found it prudent to leave Warsaw, then in the part of Poland dominated by Russia, for Cracow, which at that time was under Austrian rule. In 1891, she went to Paris to continue her studies at the Sorbonne where she obtained Licenciateships in Physics and the Mathematical Sciences. She met Pierre Curie, Professor in the School of Physics in 1894 and in the following year they were married. She succeeded her husband as Head of the Physics Laboratory at the Sorbonne, gained her Doctor of Science degree in 1903, and following the tragic death of Pierre Curie in 1906, she took his place as

Professor of General Physics in the Faculty of Sciences, the first time a woman had held this position. She was also appointed Director of the Curie Laboratory in the Radium Institute of the University of Paris, founded in 1914. Her early researches, together with her husband, were often performed under difficult conditions, laboratory arrangements were poor and both had to undertake much teaching to earn a livelihood. The discovery of radioactivity by Henri Becquerel in 1896 inspired the Curies in their brilliant researches and analyses which led to the isolation of polonium, named after the country of Marie's birth, and radium. Mme. Curie developed methods for the separation of radium from radioactive residues in sufficient quantities to allow for its characterization and the careful study of its properties, therapeutic properties in particular. Mme. Curie throughout her life actively promoted the use of radium to alleviate suffering and during World War I, assisted by her daughter, Irene, she personally devoted herself to this remedial work. She retained her enthusiasm for science throughout her life and did much to establish a radioactivity laboratory in her native city - in 1929 President Hoover of the United States presented her with a gift of \$ 50,000, donated by American friends of science, to purchase radium for use in the laboratory in Warsaw. Mme. Curie, quiet, dignified and unassuming, was held in high esteem and admiration by scientists throughout the world. She was a member of the *Conseil du Physique Solvay* from 1911 until her death and since 1922 she had been a member of the *Committee of Intellectual Co-operation of the League of Nations*. Her work is recorded in numerous papers in scientific journals and she is the author of *Recherches sur les Substances Radioactives* (1904), *L'Isotopie et les Éléments Isotopes* and the classic *Traité' de Radioactivité* (1910). The importance of Mme. Curie's work is reflected in the numerous awards bestowed on her. She received many honorary science, medicine and law degrees and honorary memberships of learned societies throughout the world. Together with her husband, she was awarded half of the Nobel Prize for Physics in 1903, for their study into the spontaneous radiation discovered by Becquerel, who was awarded the other half of the Prize. In 1911 she received a second Nobel Prize, this time in Chemistry, in recognition of her work in radioactivity. She also received, jointly with her husband, the Davy Medal of the Royal Society in 1903 and, in 1921, President Harding of the United States, on behalf of the women of America, presented her with one gram of radium in recognition of her service to science. Curie died in Savoy, France, after a short illness, on July 4, 1934.

Curie Biographies from Nobel Lectures, Physics 1901-1921, Elsevier Publishing Company, Amsterdam, 1967