

Cornell Chemistry Research

The Graduate Alumni Newsletter
of the Department of Chemistry
at Cornell University and the
Society of Cornell Chemists

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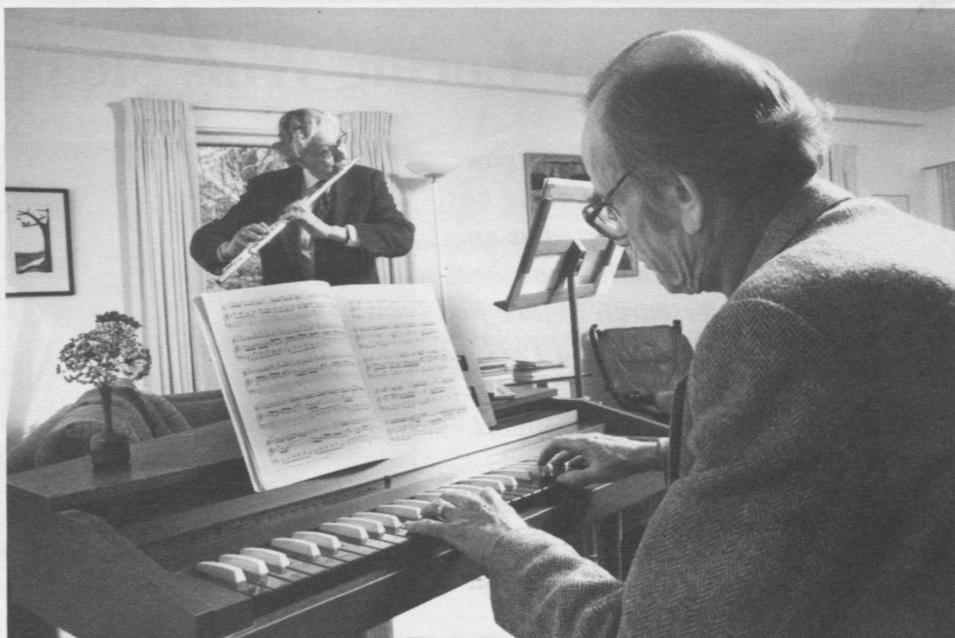
Environmental Prize Shared by Cornell Chemist, Biologist

Professors Jerrold Meinwald (Goldwin Smith Professor of Chemistry) and Thomas Eisner (Jacob Gould Schurman Professor of Biology) have been named winners of the Tyler Prize for Environmental Achievement for 1990. The two Cornell researchers will share the prize of \$150,000. The awards were presented during a ceremony at the Four Seasons Hotel in Los Angeles on March 30, 1990.

Since 1973, the Tyler Prize has been the largest achievement award presented by an American institution, and is widely recognized as the most prestigious environmental prize in the world. Prizes are awarded for "the protection, maintenance, improvement or understanding of ecological and environmental conditions anywhere in the world; or the discovery, further development, improvement, or understanding of known and new sources of energy."

Meinwald and Eisner are considered the "founding fathers" of chemical ecology, the study of how organisms interact chemically to attract prey, to defend themselves, and to reproduce. Eisner offers an unprecedented understanding of how insects communicate while Meinwald defines the communication in chemical terms.

Meinwald and Eisner have worked together on a number of projects in which they



The two are not only in concert scientifically but also musically. Eisner (right) plays the piano and harpsichord, Meinwald (left) the flute and recorder. A mutual passion for chamber music was the inspiration for a personal and professional collaboration which has spanned three decades.

studied the biological functions of chemicals in insects and plants. The principles derived from their work are a foundation for chemical-ecological studies of all other organisms.

According to Professor Roald Hoffmann, 1981 winner of the Nobel Prize in Chemistry, "the research carried out by Meinwald and Eisner has caught the imagination of chemists and biologists

around the world, and has stimulated many other research workers to seek the fundamental, organic chemical bases for important behavioral and ecological phenomena."

Meinwald, an organic chemist, was one of the founding directors of the International Centre of Insect Physiology and Ecology (ICIPE) in Nairobi in 1970. Meinwald's research has illuminated the behavioral and

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ecological functions of many "natural products". He has characterized and synthesized dozens of novel organic and plant defense and communication. His collaborative work with Eisner on the utilization of pyrrolizidine alkaloids by insects has led to the finding that some male insects are able to protect their offspring by first acquiring these toxic alkaloids from plants, and then donating them to the female during mating. The work also led to the discovery of the first example of sexual selection based on a single chemical entity.

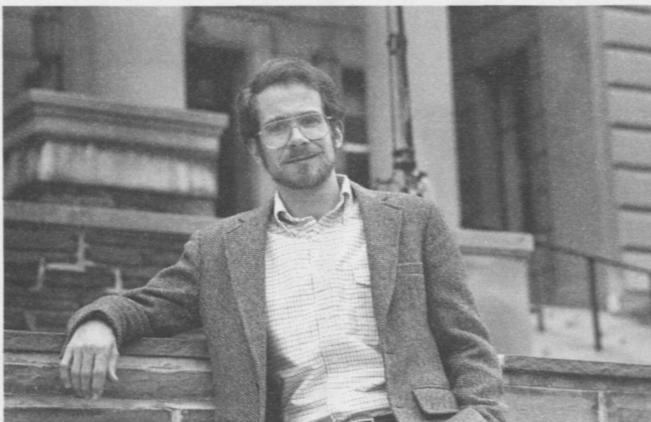
"Chemical Communication" is a popular graduate-level course co-taught by the two researchers, in which students at Cornell learn that chemical compounds in living organisms mediate sexual, parent/offspring, and predator/prey interactions. Meinwald teaches a similar course for undergraduates, called "Molecular Messengers in Nature."

Eisner is a co-author of *Life On Earth*, an introductory biology textbook, and of *Animal Adaptation*, which describes the mechanisms through which organisms achieve ecological fitness. His work on

arthropod defenses, much of it done in collaboration with Meinwald, has established the principles that govern the chemical interactions of organisms in nature. He is well-known for his analysis of the bombardier beetle's defense system, and was featured on a public television program in which he demonstrated the beetle's unique ability to eject a toxic defensive spray. Eisner has been involved in several projects that have resulted in preservation of important tracts of land in Texas, Florida, and Costa Rica. He testified before Congress in 1982 in support of the Endangered Species Act.

Roger Loring Wins Sloan Fellowship

Assistant Professor Roger F. Loring has been selected as an Alfred P. Sloan Research Fellow for 1990-91 and 1991-92. He will receive \$25,000 to support his research in theoretical physical chemistry.



Loring, who joined the department in 1987, works in the general areas of equilibrium and nonequilibrium statistical mechanics. His current research projects include time-resolved vibrational spectroscopy in condensed phases, electronic spectroscopy of the liquid state, and studies of polymer dynamics in complex environments. He describes one aspect of his research as follows:

"The characterization of the electronic states of molecules in a liquid is fundamental to our understanding of photochemistry in solution, but much of what is known about the electronic structure of molecules pertains to isolated molecules in the gas phase. When a molecule enters the liquid state, its electronic structure is altered by intermolecular interactions.

"Experimentalists investigate the electronic structure of solvated molecules with optical spectroscopy. We apply the methods of quantum statistical mechanics to elucidate the effects of intermolecular interactions on the electronic absorption spectra of molecules in solution, thus gaining an understanding of the nature of electronic excited states in liquids."

Laura Philips Wins AAUW Award

Assistant Professor Laura A. Philips has been named the recipient of the 1990 American Association of University Women Recognition Award for Young Scholars.



The award is presented to a woman under the age of 35 who has earned a doctorate and who has made significant contributions to her field. Only one award is presented nation-wide, and candidates from all fields of sciences, arts and humanities are considered. This marks the third time that a scholar from Cornell University has won the award; no other institution has had more than one successful candidate.

Philips came to Cornell in 1987, after graduate work at the University of California at Berkeley and an NIH postdoctoral position at the University of Chicago, and launched into both research and teaching with enthusiasm.

Professor Philips explores the physical structure and chemical reaction dynamics of molecular clusters in supersonic molecular beams. Her research group uses high-resolution infrared laser spectroscopy in the study of small, biologically important molecules to explore the role of the local molecular environment on both physical structure and chemical reactivity. She has been instrumental in restructuring the under-graduate physical chemistry lab courses to modernize the content and to generate a more cohesive curriculum (see Issue #46, *Cornell Chemistry*). She is a co-adviser, with Professor Charles Wilcox, of the Cornell Chemists, an undergraduate organization; co-adviser, with Professor Barbara A. Baird, of Women in Chemistry; and taught the senior honors seminar in spring 1988.

The award will be presented in a ceremony at the national meeting of the American Association of University Women on June 23, 1990, in Washington, D.C.

David Zax Joins Faculty



David B. Zax

David B. Zax will join the faculty as an assistant professor in July 1990. Zax received his PhD degree from the University of California at Berkeley, where he was an NSF Predoctoral Fellow with Alex Pines. He worked with Shimon Vega at the Weizmann Institute, and then with Charles P. Slichter at the University of Illinois as an IBM Postdoctoral Fellow. He is currently a staff scientist at the Weizmann Institute.

Zax's research program focuses on studies of chemical systems in the solid state which lack long-range order. He uses nuclear magnetic resonance (NMR) and

nuclear quadrupole resonance (NQR) to probe chemical systems, looking for information about the chemical and electronic environment which may be unavailable from other study techniques.

As he begins his work here at Cornell, he will be working on three projects in particular: the structure and growth kinetics of highly-doped Si, catalysis on small metal particles, and microscopic structure of alloy semiconductors.

Zax's arrival will bring to 32 the number of full-time faculty members in the Department of Chemistry.

New Physical Sciences Librarian Joins Cornell Staff

The new librarian at Clark Physical Sciences Library has a background in chemistry and an eye to the future.

Patricia E. O'Neill received her BS in chemistry from Pacific Lutheran University and took a laboratory position with Hercules Incorporated. While in that position, she found she enjoyed the library research part of her job, and became increasingly involved in chemical information and information technology issues.

Three years later, with the encouragement of both her supervisor at Hercules and the company librarian, she began work on an MS in Library and Information Science at the University of Illinois at Champaign-Urbana. After receiving her MS degree she joined Bell Communications Research as a reference librarian. In 1986 she became Chemistry Librarian and, in 1987, Head of the Science Department of General Libraries, at Emory University in Atlanta, Georgia.

O'Neill pointed out that the combination of a technical degree and a library degree makes it possible to find interesting careers in either industry or academia. She had originally planned to stay in an industrial environment, but found the academic environment gave her more freedom to pursue a variety of interests. She finds her present position demands the best of both her managerial and technical skills. In addition, the librarian in academia is an educator. O'Neill wants all graduate

students to use the library as a research tool, and plans workshops on "library" issues such as publication cycles and how to minimize the cost of on-line searching. She plans to institute regularly scheduled tours of the library for new graduate students.

Clark Library currently holds over 80,000 volumes, and is the primary resource library for the departments of chemistry, applied and engineering physics, astronomy, and physics. Two Assistant Physical Sciences Librarians, Susan Markowitz and Mary Thomas, assist O'Neill in the library's operations.

O'Neill said she is pleased to find that Cornell's physical science collections are very strong. Her plans for improvements include computers, as might be expected: all circulation will be automated in September 1990.

Eventually, more library staff members will have computer work stations and will be trained to assist with computerized search services, such as COMPASS and the Online Catalog. The new librarian would also like to see a separate room in Clark Library devoted to computer workstations so people can do on-line searches more easily.

Access to the on-line search facilities has already improved for graduate students, since O'Neill is available to help them do their searches—she says it's one of her favorite things. In addition, if students phone one day ahead for an appointment, a library staff member will be available to help them with on-line searches after 5 p.m., when the rates go down. To make it still easier, the student doesn't even have to be there! How customer-oriented can you get? The day-ahead reservation facilitates library personnel scheduling, and also gives the librarian a chance to ask questions which will make the search more cost-efficient, more complete, and more effective.



Patricia E. O'Neill (right) and Susan Markowitz (left).

ACS

Don't miss the Cornell Continental Breakfast at the August ACS meeting in Washington, D.C.! Tickets are only \$5.00 per person, and can be purchased in the registration area.

The Society of Cornell Chemists asks you to support the cost of printing and mailing this Newsletter with your voluntary, annual dues of \$10. Make your 1990 check payable to "Cornell Chemistry" and mail it to The Society of Cornell Chemists, G-03 Baker Laboratory, Department of Chemistry, Cornell University, Ithaca NY 14853-1301

Chemistry Alumni and Friends Survey

Spring 1990

Please help us maintain an accurate, up-to-date mailing list by filling out this survey, tear it out, and mail it back to us.

Name and Address:

(If alumnus)

Year of Graduation

From Cornell: _____ Degree(s): _____

Faculty Advisor in Chemistry: _____

Degrees received since leaving Cornell: _____

(If not alumnus)

Affiliation with Cornell Chemistry: _____

Employer:

Please include
company name
and your title.

Do you prefer to receive the *Cornell Chemistry Newsletter*

a) at home or b) at your business address?

By which of the following titles do you prefer to be addressed? (Please circle)

Dr. Ms. Mr. Mrs. Miss none

What do you like most about the newsletter?

What do you like least about the newsletter?

Professional/personal news for inclusion in the next Newsletter:

Place
Stamp
Here

Donna Middleton
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G-03 Baker Laboratory
Cornell University
Ithaca, New York 14853-1301

Alumni News

Edward Arnold, PhD '82, who is now an assistant professor at Rutgers University, has won an Alfred P. Sloan research fellowship of \$25,000.

John and Cheryl Cleveland, PhD's '90 and '89 respectively, welcomed a baby girl, Ashley Melinda, on March 19, 1990. John and Cheryl are now living in Michigan, where he works for Dow Chemical and she works for Dow Elanco.

H. Clark Metcalfe, a graduate student here in 1941-42, wrote to say, "The year of graduate work and lab assisting at Cornell was an important turning point in my career. I discovered that I was more interested in teaching chemistry than in becoming a research chemist. The entry of the United States into World War II was emotionally upsetting, too. The Chemistry

Department cooperated with my wish to combine Education courses with graduate work, but the time required to obtain a Masters Degree and a teaching certificate in New York state would have required two more years of study. I could do the same thing in two summers and an academic year at my undergraduate alma mater, the University of Pittsburgh. So I returned to Pitt.

"My subsequent career included over 20 years as a high school chemistry teacher in both public and private schools in and around Pittsburgh and nearly 40 years as a coauthor of a successful secondary school chemistry textbook. Two chemistry courses I took from Professor Hoard, Thermo-dynamics and Electrochemistry, have been very helpful to me. Professor Hoard was a fine teacher."

Joseph M. Ragosta, PhD '86, has been appointed Vice President of Marketing and Technical Support by Bio-Recovery Systems, Inc., Las Cruces, New Mexico. He will be responsible for marketing of waste treatment systems, new product introduction and customer technical support at Bio-Recovery Systems.

Alumni Deaths

Tien Liu, PhD '39, November 30, 1989.

Phillip A. Miller, BA '30, PhD '36, August 20, 1989.

Robert L. Voorhees, BChem '35, CE '36, December of 1989.

Reunion Open House

The annual Reunion Open House will take place in Room 125 Baker Laboratory on Friday, June 8, 1990 from 1:30 to 4:00 p.m. Faculty members will host the occasion, which will feature displays of memorabilia. Please stop by and visit with us!



Franklin de Beers, BCHE '34 (left) and W. Donald Cooke, Professor Emeritus (right), at the Reunion Open House last year.

A.D. White Professor-at-Large Here

Raphael D. Levine, a professor and director of the Fritz Haber Research Center for Molecular Dynamics at the Hebrew University in Jerusalem, is an A.D. White Professor-at-Large for 1989-90.

University professors-at-large spend two weeks on campus twice during their six-year tenure. Professors-at-large are individuals who have achieved outstanding international distinction.

During his initial stay on campus in February, Levine delivered three disciplinary lectures. A fourth lecture, for the general Cornell population, was entitled *The Dynamical Structure of Molecules: Toward a Chemical Understanding of Reactivity*.

Editor's Letter

MAY 21 1998

Back in late January, I sent out dozens of letters to alumni who were on our Chemistry mailing list, but for whom we had incomplete information (mostly about degrees). Almost everyone replied, and some were concerned lest the university had lost their records. Let me assure all of you that the university has lost none of your records. Our problem was, in most cases, a question of misspelling the last name. Well, we've fixed that, but we have another problem.

The last newsletter was sent out first-class, in an effort to find out how many of our addresses were incorrect. Unfortunately, the post office returned over 200 newsletters with bad addresses. That included both undergraduate and graduate alumni, and former postdoctoral associates. Our best efforts to stay in touch, which have included reader surveys, pestering the profs, and biennial requests for printouts from alumni records, have not helped us to overcome the problem of people who move and don't tell us. Please, when you move, send us a change of address card. We don't usually mail newsletters first-class, so the post office doesn't return them, and we don't find out that our records are wrong.

We'll publish, from time to time, a list of "lost alumni," in hopes that you will be able to help us find them.

Thanks to all of you who responded to our request for help, and thanks, also, for all the nice things you wrote about the Newsletter.

-Donna Middleton

Cornell Chemistry is published by the Department of Chemistry at Cornell University.

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