The groundbreaking for our new Chemistry Building is scheduled for October 2001. The site was one formerly occupied by the Paul Robeson Cultural Center on Shortlidge Road nestled between Wartik Laboratory, the Ritenour Health Center and Fenske Laboratory. The new six-story, 185,000 square foot structure will provide state-of-the-art facilities for research and graduate education.

President Graham Spanier remarks, “The new building will be one of the largest and most significant undertakings in Penn State history, both because of the financial commitment required for the building and the important contribution we anticipate from the scholarship that will emanate from the building.”

The architects (a joint venture between Bower, Lewis, Thrower of Philadelphia and Payette Associates of Boston) have designed an L-shaped building. The long east-west wing includes synthetic and biological laboratories with a large number of hoods, sinks, lab benches and house utilities. The wing along Shortlidge Road has a separate foundation to provide vibration free space for sensitive instrumentation used in the analytical and physical chemistry laboratories. The ground floor of this wing includes space for an NMR suite. The Mass Spectrometry facility is located on the third floor near the connection to the new Life Sciences Building mentioned below. The plans also include two new seminar rooms, a modern stockroom, a research instrument facility, new administrative offices and, of course, offices for faculty and students.

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FROM THE DEPARTMENT HEAD

Greetings again from the Penn State Department of Chemistry. We all hope you are enjoying life with good health and having fun in and out of the field of chemistry. We have again had an active change-filled year as we continue to grow and improve. I summarize some of this year’s events below.

After nearly two years of being Department Head, I would like to reflect on where we have been and where we are going. This is truly a great department with an outstanding faculty and staff to serve and work with some of the best students anywhere. I have to say that everyone involved has made it a pleasure, as well as an honor to act as Department Head.

We have continued to plan, hire new personnel, and to grow in all the areas of chemistry while expanding on our efforts to be a premiere department in interdisciplinary education and research. With this in mind, we have developed a vision for future growth to position us as the leading department in chemistry education and research. It is clear that chemistry will have an important role in the major issues facing society in the next century. These issues will include health care, the environment, energy and new materials. In addition, chemistry will be a critical component in our understanding and exploring the next frontiers in science: the nanoworld, extreme environment, deep seas, space exploration and the brain.

Our department plans to develop and grow programs in undergraduate and graduate education, exploration of science and outreach aimed at these areas while moving beyond the traditional areas of chemistry that were used in the last century. This will be accomplished by embracing collaborative research, hiring new faculty in areas that correspond to the issues and frontiers listed above and by continuing to

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FROM THE EXECUTIVE OFFICER

Dear Alumni and Friends,

In January 2000 I began my position as Executive Officer and I am pleased to have become a part of the Penn State Chemistry program. My role is to work with faculty, staff, and students to align our resources so that we can achieve our goals in education, research and service. I would like to share with you information on some of the projects that I have been working on during my first year.

One of the most enjoyable parts of this job has been my participation on the Planning Committee for the new chemistry building. The groundbreaking ceremony is scheduled for this fall and everyone at University Park is excited about the opportunity to move into state-of-the-art laboratories and service facilities. In addition to the articles and photographs in this newsletter, you can find more information about the new building by visiting the Chemistry web site at www.chem.psu.edu.

An important part of my position is to strengthen ties with our alumni. I have met some of you and hope to meet more at national meetings such as ACS and CCR. There will be other opportunities this fall at University Park when we host tailgate receptions before selected football games. You will receive more information about these events later in the summer.

We are fortunate to have been able to hire a full time web page coordinator to help us strengthen our efforts in publicity and graduate recruiting. The newly designed web site is

CONTINUED ON PAGE 23
NEW RESEARCH CENTER

A research center designed to enhance our existing understanding of small-scale science and facilitate an increased use of nanoscale technology has become a reality with an agreement between Penn State and governamental, industrial and international partners.

With the Center for Molecular Nano fabrication and Devices, researchers expect to gain a better understanding of electronically and mechanically functional molecules coupled to larger-scale structures. Such structures, among them molecular motors, exist at a size of one to ten nanometers — the size range where biology, chemistry, electrical engineering, physics and materials science meet and the size range many scientists believe holds the key to important technological breakthroughs. In conjunction with the National Science Foundation-funded National Nanofabrication Users Network and the Penn State Nanofabrication Facility, a significant portion of the center’s efforts include state-of-the-art capabilities in directed assembly, self assembly, selective chemical functionalization, molecular coupling and molecular electronics.

“We are applying what we know in the area of selective chemistry to advance nanolithography down to the molecular scale, while simultaneously bringing functional molecular assemblies up to where we can connect them to the outside world,” says Paul Weiss, Professor of Chemistry and Director of the Center. “Merging and expanding our chemical and nanofabrication communities gives us the singular capability of advancing both fields.”

Along with cutting-edge research, the center’s mission includes education and outreach efforts: to train the next generation of interdisciplinary researchers for positions in academia, industry and government laboratories; to bring research into classrooms at all levels nationwide through direct outreach and teacher training; and to bring this area of science and future technology to the public through science museums and other programs. The Center’s partners in outreach include Penn State Public Broadcasting and The Franklin Institute Science Museum.

Business partners in the effort include: Atoyltices, IBM, Lucent Technologies, Molecular Electronics Corp., Motorola, TriQuint and Zyxvex LLC. Government partners are the Naval Research Laboratory, the National Institute of Standards and Technology and Sandia National Laboratories. Kyoto University in Japan is a partner institution with ongoing exchanges of students, faculty and other researchers. Funding for Center projects comes from the Army Research Office, the Defense Advanced Research Projects Agency, the National Science Foundation, the Office of Naval Research, as well as from industrial partners. Chemistry faculty in the Center are: David Allara, Ray Funk, Christine Keating, Tom Mallouk, Paul Weiss and Mary Beth Williams.

For more information see the Center’s web site at www.cmnd.psu.edu.

ROSS/ABBOTT TO FUND LAB

The Ross Products Division of Abbott Laboratories and The Abbott Laboratories Fund have donated $50,000 to Penn State University to name a laboratory in the University’s new chemistry building.

The chemistry building is part of the largest single academic construction project currently planned by Penn State University on its University Park campus. A portion of the building’s cost is being financed by private support from alumni, friends, corporations and foundations.
The last decade brought wonderfully interesting and important advances across a wide range of scientific disciplines, and it was the best decade ever for science in the Eberly College of Science. The increases in activity in the College have left us bursting at the seams and in need of more and better facilities. Fortunately, plans for our new chemistry building and a life-sciences building that will be shared with other colleges are well under way. These two buildings will be physically linked to facilitate collaborations. Together, the buildings provide not only badly needed new space, but also a physical focus for science and a statement about the future of science at Penn State.

Daniel Larson, Dean, Eberly College of Science

Having a high quality facility is vital to our efforts to be recognized as one of the top ten chemistry departments in the country. The new building will provide absolutely the best opportunities for our educational and outreach programs.

Andrew Ewing, Head, Department of Chemistry

Designing the new Chemistry Building has been a fantastic experience! Everyone (architects, committee members, Chemistry faculty and staff, and Physical Plant staff) has made this project a priority. Considerable time and thought has gone into designing a building that will allow us to perform state-of-the-art chemistry research.

Barbara Garrison, Distinguished Professor of Chemistry, Chair of the Building Planning Committee
THE FINAL COST of the new Chemistry Building is estimated at $62.3 million ($8.86 million for design and contingencies, $45.44 million for construction and $8 million for furniture and equipment). Combined with the Life Sciences Building costs of $44 million and Shortlidge mall enhancement costs of $1.5 million, the total project cost is about $107.8 million. The money to build and furnish the chemistry facility is a combination of state funds and development efforts by the Eberly College of Science. To learn more about the opportunities for contributing to the building fund, please contact Sue Donley in the ECOS development office by email at swd1@psu.edu or by phone at (800) 297-1429.

The Chemistry Building is configured in an “L” shape with a wing along the service drive to the south of Fenske Lab and a wing along Shortlidge Road to the east of the site. The site arrangement features massing along Shortlidge Road to complement the surrounding buildings while creating an impressive interior courtyard within the site. In addition, this design preserves two large existing site trees, an American Elm and a cluster of Silver Maples.

Working on this project continues to be an extremely rewarding experience. I want to express my appreciation for the time and effort that the Chemistry Department Design Committee has devoted to the project.

LISA BERKEY,
BUILDING PROJECT MANAGER

I’m excited about the new features the building offers to my students. There will be a walkway between their desks and benches that will facilitate student interaction and improve safety. The lounges and group resource room will provide needed space for students to interact, study or eat lunch. The space will have a more open feel to it and allow optimal positioning of our equipment.

PHILIP BEVILACQUA
ASSISTANT PROFESSOR OF CHEMISTRY

Incorporating all of the research support services, including spectroscopy, stockroom, electronics and financial affairs in a single building will expedite the prosecution of my research by facilitating the little things which, when they go wrong, seriously impede progress. Also, the temperature and humidity control incorporated in the new building, will greatly improve the reproducibility of sensitive experiments.

PHILIP BEVILACQUA
ASSISTANT PROFESSOR OF CHEMISTRY

We have dedicated a section of our web site just for you to monitor the construction progress. Visit us at http://www.chem.psu.edu to see floor plans, photographs and a web camera with live updates from the construction site.


KEN FELDMAN
PROFESSOR OF CHEMISTRY
**Recipe for Pure Water**

By Jens Thomas

Cleaning up water contaminated with deadly chemicals is a piece of cake, say chemists who have discovered a cheap and easy way to break down organic poisons. With some improvements, they say, the method could even be used to dispose of nerve gas and other chemical weapons.

Organic chemicals are among the world’s most worrisome pollutants. They include PCBs and dioxin, and military wastes from expired explosives to VX, a lethal nerve gas. Since organic compounds consist almost entirely of carbon, hydrogen and oxygen, they can theoretically be broken down into water and carbon dioxide, along with trace quantities of relatively harmless ions such as nitrates, sulphates and chloride.

But up to now, this process has required either very harsh and expensive conditions, or equally toxic chemicals. Now chemists led by Ayusman Sen at the Pennsylvania State University have come up with a simple recipe: dissolve a small amount of oxygen and carbon monoxide in the water containing any organic chemical, add a pinch of a cheap metal catalyst and cook at 85 °C for several hours.


The researchers discovered the method when they noticed that dissolved organic compounds in contact with the metal palladium tend to oxidise the process in which a molecule loses electrons and combines with oxygen. How compounds become sufficiently oxidised to break down completely is still poorly understood. Sen believes the metal catalyses the compound’s oxidation both directly and indirectly, by converting water and oxygen into hydrogen peroxide, a powerful oxidising agent.

Having tested the process with simple molecules such as methane, Sen moved on to try more complex compounds which are chemically similar to nerve gases but safe. “We didn’t actually use nerve gas, my students would kill me,” he says. The imitation nerve gas vanished without a trace.

Experts have reacted enthusiastically. “It’s one of the goals of the people who clean up industry,” says Robert Lyndsay Smith, who researches oxidative catalysts at York University. “You’d have thought someone would have tried it before,” he says. “They have put it together quite nicely.”

Sen says the method might eventually be useful as an alternative to incineration for destroying chemical weapons stockpiles. However, in its existing form, the technique would require too much water to be practical, so Sen is trying to improve the process.

For more information visit Ayusman Sen’s web site at [http://research.chem.psu.edu/axsgroup](http://research.chem.psu.edu/axsgroup)
FEATURED RESEARCH

FAST ENERGY DEPOSITION EVENTS AT SURFACES

THE GARRISON GROUP

Cell Imaging, tattoo removal, LASIK eye surgery, erosion of the moons of Saturn and mass spectrometry— is there a common denominator? Seemingly disparate, these processes all rely on a fast energy deposition event at the surface of a solid with subsequent removal of material. If a particle beam with kinetic energy several thousand times the strength of chemical bonds deposits the energy, a collision cascade (i.e., a sophisticated pool game) develops in the solid leading to the ejection of particles, a phenomenon affectionately called sputtering. Energetic particles cause erosion of the moons of Saturn, are the source of dopants in semiconductors, and serve as a tool for depth profiling concentrations of the dopants. Sputtering forms the basis of the mass spectrometric techniques of secondary ion mass spectrometry (SIMS) and fast atom bombardment mass spectrometry (FABMS), both of which are used for analytical applications including imaging of biological samples in the Winograd group here at Penn State. Alternately, if the source of the energy is a laser, a collective process called ablation ensues, again leading to material removal. Applications of ablation include matrix assisted laser desorption ionization (MALDI) mass spectrometry, deposition of thin films and numerous medical procedures including corrective eye surgery and tattoo removal.

The focus of the Garrison research group is to understand the fundamental events involved in the fast energy deposition processes as well as the ramifications of the underlying physics on the applications. Modeling the sputtering process has been an on-going effort of her group for over two decades. Using classical molecular dynamics simulations with increasingly sophisticated many-body interaction potentials, they provide experimentalists the concepts of how atoms and molecules move in the solid and are finally ejected as well as making quantitative predictions about energy and angular distributions. An example of the ejection of a polystyrene tetramer from a silver substrate is shown in Figure 1. Several of the Ag atoms are moving in a concerted fashion to push off the polystyrene tetramer with low internal energy such that it can reach a detector without fragmenting. Current efforts are aimed at determining how really large molecules eject and at defining the optimal experimental conditions to enhance large molecule ejection.

Modeling laser ablation is a new venture for the group with their first paper published in 1997. Under the conditions of UV MALDI, the simulations clearly show that a phase transition occurs due to the overheating of the material. As a consequence of the phase transition, individual molecules as well as clusters of molecules form the ablation plume. Shown in Figure 2 is the ablation plume at a time when some of the liquid droplets have reached their equilibrium spherical shape, another droplet is about to form and there are still cavities in the substrate. The simulations predict the existence of an ablation threshold, clusters in the plume, entrainment of large analytes in the plume, a new velocity distribution equation, forward peaked angular distributions and pressure pulse characteristics in the solid. Experimental collaborators are investigating results of the simulation that have not already been confirmed by pre-existing data. Current efforts are aimed at understanding how the large fragile biomolecules being investigated in MALDI can survive and reach the detector, the physics of the underlying phase transition (explosive boiling) and developing a multiscale model to propagate the ablation plume to longer times.

Animations of both the sputtering and ablation events, graphics from the simulations and other research information can be found at the group web page - http://galilei.chem.psu.edu

Figure 1.

Figure 2.
New Faculty

Richard Koerner
Assistant Professor of Chemistry
B.S., University of Arizona, 1991
Ph.D., University of California, Davis, 1997

Biological Inorganic Chemistry

Research in the Koerner group focuses on how transition metals are tuned by proteins to carry out a wide variety of biological reactions. A successful approach towards understanding metalloprotein function has been, and continues to be, the synthesis of low molecular mass analogues. These synthetic analogues can accurately reproduce the structural, spectroscopic and functional properties of protein active sites, and are extremely useful in elucidating metalloprotein reaction mechanisms. Additionally, an understanding of how biomolecules tune transition metal properties will lead to a toolbox that can be used to design and synthesize artificial enzymes. Two bioinorganic projects in the Koerner group are described below.

Iron porphyrins (hemes) are found in a wide variety of proteins and enzymes. They are responsible for processes such as electron transport, and the transportation, storage and activation of small molecules. The protein environment about the heme modulates these different biological roles. In some cases, covalent modification of the porphyrin ligand is used to tune its reactivity. These modifications can lead to new hemes that are capable of carrying out reactions their unmodified precursors can not. One example is the P460 heme of hydroxylamine oxidoreductase (HAO), which is cross linked to the protein via a tyrosine residue. The unusual structural, spectroscopic and reactivity properties of this heme are poorly understood. By synthesizing structural analogues of the P460 heme, we hope to determine how HAO functions and why this unusual heme is necessary.

A second project involves the design of peptides that are capable of binding transition metal cofactors. These peptides are based upon stable protein structural motifs and the incorporation of artificial amino acids. The use of artificial amino acids offers a range of ligand donors and structural motifs not available to biological expression systems. Automated synthesis is used to produce the desired peptide. These peptides can also be used in a building block approach towards the assembly of larger structural motifs. One goal of this project is to discover the important aspects of protein structure that determine the active site properties of known metalloproteins. Another goal is to take advantage of artificial amino acids to produce metalloenzymes with reactivity properties not possible with the twenty proteinogenic amino acids.
**NEW FACULTY**

**SHARON HAMMES-SCHIFFER**

*Shaffer Associate Professor of Chemistry*

B.S., Princeton, 1988

Ph.D., Stanford University, 1993

**THEORY AND SIMULATION OF CHARGE TRANSFER REACTIONS**

**Charge transfer** reactions play a vital role in a wide range of chemical and biological processes. Professor Hammes-Schiffer’s research centers on the theoretical and computational investigation of charge transfer reactions. This research combines the development of new theoretical and computational methods with applications to chemically and biologically important processes. The types of processes studied include multiple proton transfer, proton-coupled electron transfer, and hydride transfer reactions in solution and in proteins. The goal of this research is to elucidate the charge transfer mechanisms and to predict rates and kinetic isotope effects for comparison to experiment.

One focus of the Hammes-Schiffer group is the development of an analytical theory for multiple charge transfer reactions. In this theory, the solute is described with a multistate valence bond model, the solvent is represented as a dielectric continuum, and the active electrons and transferring protons are treated quantum mechanically. Expressions for the free energy surfaces and rates have been derived. This theory has been applied to proton-coupled electron transfer through asymmetric salt bridges and between iron bimimidazoline complexes.

Another focus of the Hammes-Schiffer group is the development of methodology for the mixed quantum/classical molecular dynamics simulation of charge transfer reactions. In this methodology, the transferring hydrogen nuclei are treated quantum mechanically to include quantum effects such as hydrogen tunneling. This methodology has been used to simulate the nonequilibrium dynamics of proton transport along proton wires, which play an important role in the translocation of protons over large distances in proteins. This approach has also been applied to proton and hydride transfer in the enzyme liver alcohol dehydrogenase, which plays a critical role in metabolism.
AWARDS

FACULTY & STAFF

Barry Auman received the 1999 Chemistry Staff Excellence Award. Barry is a Technical Service G4 in the Maintenance Shop.

Stephen Benkovic was awarded the Christian B. Anfinsen Award in 2000.

Philip Bevilacqua was selected as a 2001 Alfred P. Sloan Research Fellow. Phil’s research interests include biophysical approaches to RNA folding, catalysis, and structure, with an emphasis on viral RNAs. Phil also received a Faculty Early Career Development Award (CAREER) from the National Science Foundation in 2000.

Connie Boob was awarded a 10 Year Service Award. Connie is a Staff Assistant in the Undergraduate Program.

A. Welford Castleman, Jr. has been honored with the Jost Memorial Award from the Bunsen German Chemical Society. The award honors the memory of famous kineticist and solid-state chemist Wilhelm Jost and includes a lecture tour of the seven universities in Germany where he spent his career: Berlin, Darmstadt, Goettingen, Halle, Hanover, Leipzig and Marburg. Read more about the Castleman lab in Student Awards.

Dana Coval was awarded a 10 Year Service Award. Dana is a Staff Assistant in the Graduate Program.

Andrew Ewing received the Award for Outstanding Contributions to Capillary Electrophoresis at the 1999 Frederick Conference on Capillary Electrophoresis and the Benedetti-Pichler Award for Advances in Microanalytical Chemistry from the Eastern Analytical Symposium in 2000. Andy was also awarded a two-year creativity extension from the National Science Foundation which was granted for 2001-2002. Andy was one of four recipients this year of the Distinguished Alumni Citation from Saint Lawrence University.

Chris Falzone was recognized by University President Graham Spanier for his contributions to undergraduate teaching. He received a Letter of Recognition in 2000.

Rod Kreuter was awarded a 10 Year Service Award. Rod is the Director of the Chemistry Research Instrument Facility.

Mark Maroncelli has been selected as a Guggenheim Fellow by the John Simon Guggenheim Memorial Foundation. The fellowship will help support a sabbatical leave split between the University of Texas and Penn State, during which time Mark will undertake computational studies of supercritical fluids in collaboration with other researchers.

Theresa Peters has received the Eberly College of Science Staff Award for Excellence in 2000. Theresa is an Administrative Assistant in the department.

A. Welford Castleman, Jr. was chosen for the Simon Guggenheim Foundation Fellow for 2000-2001 and the Physical Science Foundation 2000 Alfred P. Sloan Research Fellow.

Ken Shope was awarded a 25 Year Service Award. Ken is a Technical Service G5 in the Maintenance Shop.

John M. Simpson was chosen for the George W. Atherton Award that honors excellence in teaching at the undergraduate level. John is an associate professor of chemistry at Penn State Beaver.

Eric Younken received the 2000 Chemistry Staff Excellence Award. Eric is a Assistant Research Engineer in the Research Instrument Facility.

Xumu Zhang was awarded a John Simon Guggenheim Foundation Fellow for 2000-2001 and the Physical Science Foundation 2000 Alfred P. Sloan Research Fellow.

STUDENT

Steffen P. Creaser, a postdoctoral fellow in Blake Peterson’s lab, received a three year, $105,000 postdoctoral fellowship from the Komen Foundation for breast cancer research. His funded proposal was entitled “Novel Synthetic Antiestrogen Prodrugs Targeting Tamoxifen-Refactory Breast Cancers.”

Zachary Donahauer, a graduate student in Paul Weiss’ group, was selected as a participant in the Semiconductor Research Corporation’s Graduate Fellowship Program. Zach receives tuition and fees, a monthly stipend and the Department receives an annual unrestricted monetary gift.

Stephen L. Hussey, a graduate student in Blake Peterson’s lab, received a three year, $66,000 predoctoral fellow from the Department of Defense Congres-
sionally Directed Medical Research Program in Breast Cancer. His funded proposal was entitled “Novel Synthetic Antiestrogens that Block Nuclear Estrogen Receptor Function through Plasma Membrane Localization.”

Jiyun Xu, a graduate student in Nicholas Winograd’s research group, received the William Rand Kenan, Jr. Award, presented by Union Carbide Corp. The award consists of a trophy and a honorarium. Jiyun gave a presentation and received the award in South Charleston, West Virginia at the Technical Center at Dow Chemical Company, a subsidiary of Union Carbide.

Karin Zemska, a graduate student in Will Castleman’s research group was selected for a unique honor. She was invited to attend a symposium sponsored by the Nobel Foundation on Cluster Physics, held in Visby, Sweden. Breaking with tradition, this “by invitation only” symposium provided the opportunity for a few selected graduate students and exceptionally promising young scientists to attend.

Maureen Gramaglia, an undergrad student in Chemistry, Physics and Russian Translation won an NSF Fellowship and will be attending graduate school at CalTech. Maureen was a Schreyer Honors College student and won the Paul Axt award from that College. She was also the Chemistry Student Marshal at the May commencement with a grade point average of approximately 3.98. She recently traveled to the San Diego A.C.S. meeting to accept an award on behalf of the Nittany Chemical

OTHER STUDENT AWARDS

The Graduate Student Awards Committee is pleased to announce the winners of this year’s student award competition.

DALALIAN FELLOWSHIPS provide full stipend and tuition for a year plus a monetary award.

Ronald Aungst Funk
Gregory Bakken Jurs

JUNIOR RESEARCH AWARDS are monetary awards in recognition of outstanding accomplishments and promise.

Zachary Donhauser Weiss
Brian Leskiw Castleman
Smita Muddana Peterson
Berkeley Shorthill Glass
Wenjun Tang Zhang

GRADUATE STUDENT RESEARCH AWARDS come from various endowments, specific to certain areas of chemistry.

Edward Brothers Merz
Timothy Cutarelli Feldman
Helen Decornez Hammes-Schiffer
James Gibson Mueller
April Hennis Sen
Sean Hurley Castleman
Stever Hussey Peterson
Gregory Kauffman Jurs
Clay Kellam Allcock
Jeffery Kropf Weinreb
Julie Lapos Ewing
Xichen Lin Weinreb
Benjamin Martin Mallouk
Susan Mattingly Mueller
Chad Meserole Winograd
Shawn Mulvaney Natan
Sheila Nicewarner Allcock
Robbyn Prange Glass
Joseph Raker Mallouk
Raymond Schaak Mallouk
Elizabeth Smith Ewing
**CURRENT NEWS**

**FACULTY & STAFF**

**David Allara** was invited to speak at among other groups, the ACS National Meeting Arthur Adamson Award Symposium in San Francisco, an NSF Workshop on Molecular Electronics in Washington DC and Motorola Corporate Research Labs in Phoenix. In 1999, Dave, along with Tom Malouk and three other partners started a company: the Molecular Electronics Corporation.

**Harry Allcock** was an invited speaker at four symposia at the ACS National Meeting in San Francisco and gave two invited lectures at the ACS Millenial Conference in Wailoloa, Hawaii. Harry also presented the opening lecture at the U.S.-Japan Workshop on Hybrid Inorganic-Organic Materials. His ongoing research resulted in 16 publications, including two book chapters and two U.S. patents: *Phosphorylation of Phosphazenes and Biodegradable Mixtures of Polyphosphazene and Other Polymers*.

**James Anderson** (B.S.'57) was awarded a NSF grant in the amount of $2.5M for the creation of the Penn State Consortium for Education in Many-Body Applications. While on sabbatical during Fall 2000, Jim was invited to speak at the 22nd International Symposium on Rarefied Gas Dynamics in Sydney, Australia, the J. Heyrovsky Institute of Physical Chemistry in Prague, Czech Republic and Free University of Berlin, Berlin, Germany.

**Stephen Benkovic** has been appointed to be a member of the Editorial Advisory Board for both *Organic Letters* and *ChemBioChem*. Among his numerous invited talks were “Dynamics of Enzyme-Catalyzed Reactions” at the 2000 Mesilla Chemistry Workshop in Mesilla, New Mexico, “DNA Replication by the T4 Replication Machine,” at the Instituto Di Richerece Di Biologia Molecolare P. Angeletti in Rome, Italy, “Protein Engineering by Incremental Truncation,” at Biotechnology 2000 World Congress, Berlin, Germany, “T4 DNA Replication Machine,” at ETH, Organic Colloquium, Zurich, Switzerland, and “Assembly and Disassembly of the T4 Holoenzyme,” at the National Academy of Sciences Colloquium on the Links Between Recombination and Replication in Irvine, California.

**Jim Broyles** arrived in January 2000 to assume the newly created position of Executive Officer. In his previous position, Jim was the Director of Laboratories in the Department of Geosciences at SUNY Stony Brook. In this new position, Jim assumes responsibility for all Chemistry Department operations (fiscal, personnel, facilities) and will work to improve the Department’s success in publicity, development and outreach. He also has been working on the new building design committee.

**A. Welford Castleman, Jr.** was a plenary lecturer at a symposium sponsored by the Nobel Foundation on Cluster Physics, held in Visby, Sweden. Will was an invited participant and speaker at a workshop in Egypt, sponsored by the U.S. National Science Foundation as an extension of the earlier Gore-Moubarak agreement, to help formulate a cooperative program in advanced nanoscale materials between Egypt and the United States. Among other major presentations were a keynote lecture at the 15th International Mass Spectrometry Conference in Barcelona, Spain and invited talks at the conference “Atoms, Molecules and Quantum Dots in Laser Fields: Fundamental Processes” in Pisa, Italy. During the year, Will continued his duties as Editor-in-Chief of a Springer Verlag book series in Cluster Science and was appointed to the editorial board of the new ACS journal, *Nano Letters.* Will supervised the research of 5 students from his group who received their Ph.D. degrees during the year.


**Ken Feldman** was a Visiting Professor at the Université Bordeaux I in 2000. Allied with the Chemistry Department at Universite Bordeaux is The Institute du Pin, a research facility dedicated to the application of France’s forestry resources to furthering economic development in the region. One of his research areas focuses on a class of plant-derived naturally occurring materials called tannins. The French have for a long time been exploring the role of tannins in wine production, wood and paper processing etc. Ken’s interest in the potential medicinal applications of these molecules was new to them, and they invited him to Bordeaux to learn more about this new direction in tannin research. A collaboration is in the works. Also, the possibility of establishing a pipeline for graduate students from Bordeaux to Penn State’s Chemistry Department is being explored.

**Barbara Garrison** and her group organized and hosted the 5th International Conference on Computer Simulations of Radiation Effects in Solids at Penn State in July 2000. Barbara, along with other faculty, received a grant
for $5M from the Air Force Office of Scientific Research to create the Center for Materials Chemistry in the Space Environment.

**Sharon Hammes-schiffer** has been appointed Senior Editor for the *Journal of Physical Chemistry*. Sharon was invited to speak at among other groups, the Gordon Research Conference on Photosynthesis on “Theoretical Perspectives on Proton-Coupled Electron Transfer” in Meriden, New Hampshire, and the Canadian Computational Chemistry Conference in Quebec, Canada.

**Richard Henry** (Ph.D. ’67) was an invited speaker at 2001 Eastern Analytical Symposium.

**Tom Mallouk** implemented two of the Berkeley teaching modules in Chem 13: “Computer Chip Thermochemistry” and “Water Treatment.” Among his invited talks were the Neckers Lecture at Southern Illinois University, Carbondale and the Materials Design Institute Lecture at Georgia Tech. Tom is the 2000 Chair of the Gordon Conference on Chemical Sensors and Interfacial Design, a Member of the Chemical Sciences Council, U.S. Department of Energy and Member at Large of the American Chemical Society Inorganic Division. He continues to serve as the Associate Editor for the *Journal of the American Chemical Society* and is on the Editorial Advisory Boards of *Journal of Solid State Chemistry*, *NanoLetter* and *Advanced Functional Materials*. In 2000, Tom along with Dave Allara (Chemistry), Tom Jackson (E.E.) and Theresa Mayer (E.E.) founded the Molecular Electronics Corporation (MEC), a new company that is dedicated to the commercialization of molecular electronics technology. The company employs several Penn State alumni, including David Kaschak (Ph. D., Chemistry, 1998) and Hjalti Skulason (former Chemistry postdoc).

**Steven Weinreb** is currently President Elect of the International Society of Heterocyclic Chemistry and will be President in 2002-2003. The International Society of Heterocyclic Chemistry is an international scientific organization founded in 1968 and its aims are to promote and disseminate heterocyclic chemistry, a central discipline in organic chemistry of importance to both academic and industrial chemists.

**Paul Weiss** has been appointed to the U.S. National Committee to the International Union of Pure and Applied Chemistry and to the scientific advisory board of Zyvex, LLC, in Richardson, Texas. He was appointed Director of the new Center for Molecular Nanofabrication and Devices here at Penn State. Paul was invited to lecture at among other groups, Kyoto University Venture Business Laboratory in Kyoto, Japan, where he is a Visiting Professor of Electronic Science and Engineering; the First International Symposium on Nano-architectonic Using Suprainteractions in Tsukuba, Japan; Tohoku University Institute for Materials Research in Sendai, Japan; the Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin, Germany; NIST’s Advanced Technology Program, National Meeting-Technologies at the Crossroads: Frontiers of the Future, in Baltimore, Maryland; the 4th International Conference on Biological Physics in Kyoto, Japan; and Connections to the Nano World — NanoScience in a MegaCity, in New York, New York.

**Nicholas Winograd** is on the Scientific Advisory and Review Committee on the Chemical and Materials Chemistry Directorate for Lawrence Livermore National Laboratory and on the National Research Council Associateship Program Review Panel. Nick was invited to lecture at among other groups, Combinatorial Technologies Summit in Princeton, New Jersey and the Pittsburgh Conference in New Orleans, Louisiana.

**Gregory Wert** accepted the position of Supervisor of the Chemistry Stockroom. Greg has worked in the Stockroom for nearly 20 years and has both the experience and insights needed in this position. He plans to maintain the stockroom’s emphasis on customer service.

**Xumu Zhang** is on the editorial board of *Enantiomer*. While on sabbatical, Xumu was invited to lecture at the 32nd Great Lakes Regional Meeting in Fargo, North Dakota on “Developing a Chiral Toolbox for Asymmetric Catalytic Reactions.” He also presented “Chiral

**ARRIVALS**

Please join us in welcoming our new staff members.

**Cindy Anders** started working in April in the MRI Building at Research Park. She is new to Penn State and for Chemistry, Cindy is a Staff Assistant and Service Desk Coordinator for MRI.

**Teresa Beck** started in March as the Receptionist for the department. Her duties include scheduling meeting rooms, reconciling purchasing transactions, posting jobs updating departmental directories. Teresa came from the Computer Accounts Office, Center for Academic Computing at Penn State.

**Ken Brown** is a Lab Preparation Technician in the Stockroom.

**Steve Bumbarger** came to us from the Smeal College of Business and now works for Paul Weiss. Steve handles all the aspects of the daily office procedures and any requests from the undergraduates, graduates and post-docs who work in Dr. Weiss’ lab.
**Current News**

**Joanne Hosband** came to the department three months after receiving her Associates degree from South Hills Business School in June of 2000. She handles office procedures for ten faculty members as well as generating billing for the NMR facility and copier and assists the Chairperson of the Organic/Inorganic Chem seminars.

**Amy Luzier** comes to us from the business world where she worked for twenty-one years in purchasing, expediting and production control. Her duties include providing staff assistance to thirteen faculty members and their lab groups. Amy is a published author and in Chemistry, she is editor of the “Staff Stuff” newsletter and a committee member of this newsletter.

**Albert Rozo** recently started in the new position of Web Coordinator for the department. He comes to us from Entomology’s Honeybee Lab at Penn State where among other duties, he was web administrator.

**Natalie Willis** started last August as Staff Assistant in the Undergraduate Office. She is in charge of preparing exams, booking rooms and proctors and other administrative tasks for lecture courses in Chemistry.

**Retirements**

**F. Nevin Corl**, chemistry stockroom supervisor, has retired after 45 years of service to Penn State. First hired in October 1955 by the Department of Chemistry as a stockroom clerk, Nevin also worked as a preparation technician and stockroom inventory clerk, a position that required laboratory preparation, and was later promoted to stockroom supervisor. His enthusiasm for his work and his loyalty to the Chemistry Department and the University itself defined Nevin’s tenure at Penn State. He began his career so long ago that he started with the University 11 years before Joe Paterno was named head coach of the football team. “I liked the work and the people in the department,” Nevin said. “I liked the chemistry undergraduate students and graduate students. Plus, getting to know students from all over the world allowed me to travel the world without ever leaving the farm.” Nevin, who grew up on a farm near Fairbrook, Pa., lives in Pine Grove Mills and remains active with neighborhood and service organizations.

**L. Peter Gold**, Professor of Chemistry, has retired from the Eberly College of Science after 35 years at Penn State. As a researcher, Peter focused on high-resolution spectroscopy of small molecules and has had 37 articles accepted for publication in professional journals. In the classroom, he has taught thousands of students in general and physical chemistry courses. Peter has worked as an active member of the Penn State community, serving the University itself, the Eberly College of Science, and the Department of Chemistry with participation in numerous activities. His contributions in those areas include: University Committee on Instructional Facilities, 1997 to 2000; Acting Associate Dean for Commonwealth Educational System and Continuing Education, 1990 to 1991; President of Phi Beta Kappa chapter at Penn State, 1985 to 1986; and an ongoing role as an adviser to chemistry majors in the Schreyer Honors College. In addition, he is a member of the American Chemical Society. Peter received his bachelor’s, master’s and doctoral degrees in chemistry at Harvard University in 1957, 1959, and 1962, respectively. He joined Penn State as an assistant professor of chemistry in 1965. He was named associate professor in 1970 and professor in 1993.

**John Lowe**, Professor of Chemistry, has retired from the Eberly College of Science after 34 years as a researcher, educator, adviser and administrator. John’s research areas included quantum chemical studies of molecular conformation, chemisorption, catalysis and cancer-causing compounds. His research, which included periods of study at Cornell University, Oxford University, and the University of Paris, France, led to more than 50 journal publications and a similar number of invited talks. His commitment as a teacher and adviser is reflected by numerous awards, including the Undergraduate Student Government Teaching Award in 1984, the AMOCO Foundation Outstanding Teaching Award in 1985, and the C. I. Noll Teaching Award in 1991. In 1993, he was appointed as Penn State’s Alumni Teaching Fellow, allowing him the opportunity to assist in efforts to improve teaching practices across the University. In 1998, he was one of the first Schreyer Honors College Faculty Fellows and in 2000 he was named the first recipient of the Schreyer Honors College Excellence in Advising Award as well as the recipient of the Eberly College of Science Alumni Society Distinguished Service Award. John has served as assistant department head for undergraduate education and has been recognized with a Faculty Associates Award in 1997 for his success in fostering faculty morale and innovations. He earned his doctoral degree in quantum chemistry from Northwestern University in 1964, his master’s degree in teaching from Johns Hopkins University in 1959, and his bachelor’s degree in chemistry at the University of Rochester in 1958.

**C. Robert Matthews**, Professor of Chemistry, has retired from the Eberly College of Science after 25 years at
Penn State. Bob’s research interests included investigations of structures and the dynamics of structural changes in biological molecules in solution, in particular the mechanisms by which proteins fold to unique conformations. While here, he received numerous awards including the American Association for the Advancement of Science Fellow in 1999. Of Penn State, Bob says he enjoyed the camaraderie among the faculty in Chemistry and felt it truly is a unified department that works and plays together. He appreciated the opportunity to initiate new graduate courses in biophysical chemistry with fellow colleagues and to play a major role in establishing the connections between Chemistry and the growing biological sciences community at Penn State. Bob is not finished with academia though, as he recently started a new position as Professor and Chair of the Department of Biochemistry and Mo-

OTHER NEWS

GREGORY L. GEOFROY, Head of Chemistry from 1989 to 1990, has been appointed the 14th president of Iowa State University. Since 1997, Greg was the Senior Vice President for Academic Affairs and Provost at the University of Maryland. Prior to this, he served in several positions here at Penn State, including Dean of the Eberly College of Science and Professor of Chemistry. Greg has an extensive publication record in chemistry journals and is a member of the board of directors of the Association of Universities for Research in Astronomy. He was named a Fellow, American Association for the Advancement of Science, in 1991.

HANK FOLEY (Ph.D. ’82) was selected as the head of the Department of Chemical Engineering in July of 2000. Prior to coming to Penn State, Hank served as a professor of chemical engineering at the University of Delaware where he also was Director of the University’s Center for Catalytic Science and Technology. His research areas are nanoporous carbon materials for catalysis and separation, reaction engineering, adsorption and kinetics. Hank holds numerous memberships in professional and honorary societies including Sigma Xi, Phi Lambda Upsilon, Sigma Pi Sigma, the American Institute of Chemical Engineers (AIChE), the American Society for Engineering Educators, the American Association for the Advancement of Science and American Chemical Society. He also was a founding member of the AIChE’s Catalysis and Reaction Engineering Division and served as its chair. Hank has authored more than 80 papers, 12 patents, several book chapters and will soon publish an introductory text on chemical engineering analysis using the software program, Mathematica.

GARY E. McGRAW (Ph.D. ’65) has begun his term as President of the Council for Chemical Research. Since becoming a member of CCR in 1994, he has served on committees, chaired some committees, and acted as governing board chair in 1998. Gary earned a B.S. degree in chemistry from the University of Michigan and a Ph.D. in physical chemistry from Penn State. After pursuing postdoctoral studies at the University of California, Berkeley, he joined Eastman Chemical in 1967 as a research chemist, retiring in 1999 as vice president for technological innovation.

JOE MILLER (Ph.D. ’66) was appointed to the National Science Board by the President of the United States. He is a Fellow of the American Association for the Advancement of Science and a member of the National Academy of Engineering and recently retired from DuPont, where he held the post of Senior Vice President of Research and Development and Chief Science & Technology Officer. Joe received his B.S. from Virginia Military Institute in 1963 and his Ph.D. in chemistry from Penn State in 1966.

The following individuals contributed articles that appeared in the New Voices In Chemistry section of Chemical & Engineering News, 79 (13) 2001.

JEANINE A. CONKLIN (Chemistry: The Next Generation, p. 52) is a senior research chemist at PPG Industries. She received a B.S. in chemistry from Penn State in 1990, doing her undergraduate research with Ayusman Sen. She received a Ph.D. from the University of California, Los Angeles, in 1994. She joined PPG Industries in 1996.

CHAD MIRKIN (Nanotechnology: Fact or Fiction, p. 185) is the George B. Rathmann Professor of Chemistry and Director of the Northwestern University Institute for Nanotechnology. He received a B.S. from Dickinson College in 1986 and a Ph.D. in chemistry from Penn State in 1989, working with Greg Geoffroy. He joined the Northwestern faculty in 1991 as an assistant professor.

STEPHAN J. STRANICK (Chemical Microscopy, p. 122) is a research chemist in the Chemical Science and Technology Laboratory of the National Institute of Standards and Technology. He received a B.S. in chemistry from Ithaca College in 1989 and a Ph.D. in chemistry from Penn State in 1995,
adhere to a standard of excellence that will rate us among the highest quality departments in the world.

It is of course a great pleasure to tell you that we have already made great progress towards this goal. Last year we hired three new faculty and this year three more will join us. Beginning in 2000 were Sharon Hammes-Schiffer who we lured away from Notre Dame as an Associate Professor, Richard Koerner coming from a postdoc at Harvard and Susan Zerby, a past Penn State graduate student who had been teaching high school students. Sharon’s interests are in proton-coupled electron transport and molecular dynamics modeling. Richard’s research is in the area of bioinorganic chemistry. Susan was hired as an interim Lecturer and Director of the Physical Chemistry Laboratories and she is so good we have decided to try to keep her as Lecturer.

In 2001, we have Christine Keating, a home-grown Ph.D., Mary Beth Williams coming from a postdoc at Northwestern and Dan Sykes, who we lured away from Wisconsin. Christine’s research interests are in nanoparticles and self-assembly in liposomes to model cell processes. Mary Beth is interested in analytical and biochemical processes in nanodomains. Dan will become Lecturer and permanent Director of the Physical Chemical Laboratories. We are extremely pleased with all the new hires. They represent a major part of the future of this department.

As new faculty and staff arrive with great to do and excitement, we also have long-standing bastions of this department retiring. These departures included several people well known to most of you and more details are in a separate article. John Lowe, Peter Gold, Bill Horrocks and Nevin Corl all officially retired in the last year. I am happy to report, however, that John and Peter have continued an active role in the department’s teaching mission and Bill is still doing research. We appreciate their continuing efforts immensely.

We also are losing three other faculty. Bob Matthews has left to become Department Head at the University of Massachusetts at Wooster. Michael Natan has become Chief Technical Officer at Surromed, Inc. on the West Coast. John Desjarlais will leave this summer to join Xencor in Monrovia, CA. We wish them
'22 Wesley E. Romberger earned two degrees from Penn State and is still going strong at 99 years old.

'30 Stella (Albert) MacDonald is enjoying her retirement. Her recreation consists of bridge, needlepoint and two beautiful cats.

'36 Benjamin Harriman earned two degrees from Penn State. He retired from 3M as a Scientific & Technical Liaison in Europe.

'39 Robert Mercer retired in 1982 and is enjoying traveling the United States looking for rocks and minerals.

'40 Carl Keller is currently retired. He was a pioneer in synthetic rubber production along with Goodrich, U.S. Rubber, Goodyear and Firestone.

'47 E. Michael Lucas has been enjoying his retirement since 1988 and still follows Penn State’s athletic teams.

'48 Henry Tillson received two degrees from Penn State. He and his wife Helen recently celebrated their 50th wedding anniversary with a cruise around the Hawaiian Islands.

'49 Frank Fekete is a semi-retired consultant on polymers, reinforced plastics, molding systems and polymer concrete. He holds over 50 U.S. patents and over 75 foreign patents.

'53 Monis Manning enjoys an active retirement as an independent consultant in solving problems in plastic materials and light management in optical systems.

'57 Arthur Guenther, a research professor at the University of New Mexico, was just elected President of the International Commission on Optics.

'58 Nancy Casterlin Knight Peterson married Harley Peterson in April of 1994.

'63 Donald B. Boyd is currently serving as Editor of the Journal of Molecular Graphics and Modelling for the ACS Computers in Chemistry Division in addition to editing several volumes of reviews in Computational Chemistry.

'63 Ocke C. Fruchtnicht retired from the Civil Service at the U.S. Army Missile Command Research, Development and Engineering Center at Redstone Arsenal, AL.

'64 Roger Tanner has four adult children who have pursued college careers. He enjoys gardening, singing in choral groups, canoeing, and he traveled to Israel for the first time in 1999.

'71 Michael Tomcavage is currently working at Villanova University as a staff chemist, safety officer and hazardous waste manager.

'75 Ching-Ping Wong is currently a professor at the Georgia Institute of Technology and recently received the IEEE Millennium Medal.

'75 Dominick Burlone was elected to the Board of Directors of the Textile Research Institute in Princeton, NJ.

'78 C. Charles Ting is currently the Director of Chemistry at Bertek Pharmaceuticals, Inc.

'79 Barry Lange currently works for Rohm & Haas Co. He left research management to return to research. He has two daughters: one attends Bloomsburg University and the other attended Penn State.

'80 Joseph Ragosta relocated to Tulsa, OK to become President of Oseco. His daughter Kaitlin was born 9/23/98.

'92 Todd Garber and his wife Laura had a son, Alexander Seth, 9/7/00.

'93 Enrique Longton will be completing a J.D. degree in 2002.

'96 Wayne Way is currently the Vice President of Technology of Chemir/Polytech Labs, Inc. He is also building a recording studio in his house.

'96 Jason Goodrich is currently enrolled in the University of New Haven Forensic Science/Criminalistics M.S. Program.

'97 Michelle Polinko received her Master’s Degree in 1999 from Villanova and is currently a staff chemist in Drug Metabolism at Merck & Co.

'98 James Ford, a Pharmaceutical Analysis Chemist at Shire Laboratories, Inc., is currently pursuing an M.S. in Forensic Science at George Washington University.

'98 Jeff Bush is currently a graduate student at Florida State University.

'99 Seth Harkins is currently a graduate student at the California Institute of Technology.
DOCTORAL DISSERTATIONS AND MASTER’S THESIS

ALAN GREGORY BAKKEN, “Prediction of Chemical Properties and Biological Activities of Organic Compounds from Molecular Structure and Use of Pattern Recognition Techniques for the Analysis of Data from an Optical Sensor Array.” (Ph.D.) P. C. Jurs


KIMBERLY DAWN BURNS, “Approaches to Molecular Receptors.” (M.S.) J.T.J. Lecomte

ANGELA MARIE CANNON, “Synthesis and Characterization of Phosphazenes as Membranes and/or Ion-Coordination Materials.” (Ph.D.) H. R. Alcocock


PING CAO, “Some Highly Enantiomeric Reactions Catalyzed by Transition Metal Complexes with Novel Phosphines.” (Ph.D.) X. Zhang


HELENE YVONE DECORNEZ, “Theoretical Investigation of Multiple Charge Transfer Processes in Condensed Phases.” (Ph.D.) S. Hammes-Schiffer


CHRISTINE NICOLE ELIA, “Catalytic Oxidations and Polymerization.” (Ph.D.) A. Sen


AUDREY PAIGE FOX, “Applications of Metal Nanoparticle Arrays to Electron Transfer Studies.” (M.S.) M. J. Natan

MATTHEW WAYNE GARRETT, “Structure and Dynamics of Self-Assembled Alkylsiloxane Films on Various High-Energy Substrates.” (M.S.) D. L. Allara


JOSEPH ANDREW GOLL, “QSPR Investigations of Vapor Pressure and Boiling Point using Computational Neural Networks.” (M.S.) P. Jurs

LATA TRICIA GOOLJARSINGH, “Mode of Operation of the De Novo Purine Biosynthetic Pathway.” (Ph.D.) S. J. Benkovic

ROBERT ROBERT GRANucci, “A Novel Class of Naphthyl Calixarenes.” (M.S.) T. E. Glass

THOMAS JOHN HARTLE, “The Incorporation of Phosphazenes into Organic Polymers.” (Ph.D.) H. R. Alcocock


YUTONG JIANG, “Design, Synthesis, and Application of Novel Chiral Ligands for Asymmetric Catalysis.” (Ph.D.) X. Zhang

KARSTEN KOERBER, “Chiral Ligand Synthesis and Application in Asymmetric Catalysis.” (M.S.) X. Zhang

EUNHAE KOO, “Characterization and Chemical Modification of Polymer Thin Films Strongly Adsorbed on Aluminum Oxide Surfaces.” (Ph.D.) D. L. Allara

STEVEN EARL LAREDO, “Formation, Fragmentation, and Ionization Dynamics of Transition Metal-Carbon, Nitrogen, and Oxygen Clusters.” (Ph.D.) A. W. Castleman, Jr


MATTHEW GENE LA PORTE, “The Development of an Amide Oxidation Method and the Enantioselective Total Synthesis of the Securinega Alkaloid (-)-Phyllanthine.” (Ph.D.) S. M. Weinreb


JOHN MARTIN LEAN, “Modular Synthesis of pi-Acceptor Cyclophanes and Photoactive Composites.” (Ph.D.) T. E. Mallouk

JAMES MARTIN LONGMIRE, “Development of Novel Chiral Phosphate Ligands for Asymmetric Catalytic Reactions.” (Ph.D.) X. Zhang

CAROLE KATHLEEN MARS, “Growth and Characterization of Self-Assembled Molecular Monolayers on Gallium Arsenide.” (Ph.D.) D. L. Allara


HEIDI ENGELHARDT MCCLELLAND, “Development of Quantitative Structure-Activity/Property Relationships and the Analysis of Fiber Optic Sensor Array Data.” (Ph.D.) P. C. Jurs

KENNETH MICHAEL MEYERS, “Progress Towards the Total Synthesis of Cephalotaxine and the Harringtonine Alkaloids.” (M.S.) K. S. Feldman

JOHN C. O’NEILL, “Kinetic Analyses of the Folding Reaction of Dihydrofolate Reductase from Escherichia coli Using Spectroscopic Methods and Site-Directed Mutagenesis.” (Ph.D.) C. R. Matthews


MICHAEL PATRICK PENCE, “Approaches to Self-Assembled Enzyme Mimics.” (M.S.) T. Glass
UNDERGRADUATE PROGRAM

ALGAR CRANE PIKE, “Understanding Molecular Desorption and Fragmentation of Molecular Surfaces: An Experimental View of the Cu (100) SCS3 Surface Using Secondary Ion Mass Spectrometry.”
(Ph.D.) N. Winograd

DEBORAH ANN POLVANI, “Synthesis and Pressure Tuning of Thermoelectric Materials.”
(Ph.D.) J. V. Badding

SHERMAN MARK PONDER, “Remediation of Aqueous CR(VI), Pb(II), and TC(VII) by Supported Zero-Valent Ion Nanoparticles and Ion Exchange of CS from Complex Aqueous Streams.”
(Ph.D.) T. E. Mallouk

ROBBYN LOUISE PRANGE, “Polyphosphazenes: Telechelic Polymers and Copolymers.”
(Ph.D.) H. R. Allcock

EMILY ANN SMITH, “Distance Dependence Studies of Gold Film and Gold Nanoparticles on the Plasmon Angle in Surface Plasmon Resonance Spectroscopy.”
(M.S.) M. J. Natan

(Ph.D.) H. R. Allcock

(Ph.D.) W. D. Horrocks, Jr.

JONATHAN PAUL TAYLOR, “Novel Fire-Resistant Polyphosphazenes and Phosphazene-Containing Polymers.”
(Ph.D.) H. R. Allcock

CHAD C. TROUT, “Raman Investigations on High Pressure Phases of Carbon Based Novel Networks.”
(Ph.D.) J. V. Badding

FREDERICK G. VOGT, “Development of Advanced NMR Techniques with Applications to Chemical Systems.”
(Ph.D.) K. T. Mueller, A. J. Benesi

DENGMING XIAO, “Design and Synthesis of Chiral Ligands and Their Applications in Asymmetric Catalysis.”
(Ph.D.) X. Zhang

WE CONTINUE TO STRIVE for excellence in undergraduate education. In our last two academic years, sixty-nine students graduated from the program. Of those, forty-two received academic excellence scholarships from endowment funds, thirty-four earned ACS certified degrees and fourteen were invited to join Phi Beta Kappa. Many of our graduates headed for prestigious graduate schools, including Cal Tech, MIT, Harvard, Cornell, Stanford, Illinois, Ohio State and Penn. One outstanding student from our May 2001 graduating class is Maureen Gramaglia, who has had an extraordinary undergraduate career at Penn State. (Read more about Ms. Gramaglia in the Awards section, page 11)

To better assist our undergraduates, we have created the Chemistry Resources Center (CRC). The CRC is a 4,000 sq. ft. facility in the center of our undergraduate laboratory space providing a variety of useful services to chemistry undergraduates. The CRC consists of three special task areas, the instrument room, computer room and tutorial room. The Instrument room is filled with common instrumentation ranging from UV-Vis, IR, NMR, GC, and GC-MS. A full time Ph.D. directs and coordinates the activities of the room and its staff of TAs and undergraduates. The instrument room provides “hands on” training with instrumentation for undergraduate students and is open between 55 and 63 hours per week, providing students the option of analyzing their samples outside of lab time. The computer room has approximately a dozen networked computers, both PCs and Macs and a full suite of software is supported. I.D. cards provide 24/7 access for chemistry majors. The Tutorial room provides free tutoring by TAs and undergraduate chemistry majors. It is open most days from 8:00 a.m. until 10:30 p.m. The tutorial room is cozy, seating about 25 people and provides shelves filled with textbooks, reference books and a collection of the Journal of Chemical Education. Completing the Center are three full-time staff members who assist students with general administrative problems such as drop/add, degree audits etc.

Every year, approximately 1,000 students take introductory and advanced organic laboratories and run/interpret 1H NMR spectral data. Currently, they obtain these data on our aging 80 MHz FT-NMR spectrometers. To update our curriculum to a more problem-based format, we acquired a 400 MHz Bruker AVANCE system (NSF CCLI Program). Three off line terminals with NMR tutorials, an NMR encyclopedia and other software will form our new NMR Learning Center slated to open Fall 2001. The new NMR was made possible by a grant from the National Science Foundation with matching funds from the Department, the Eberly College of Science and Penn State.

Members of the Chemistry Department participated in a number of outreach activities, some involving local public schools. Last year, a group of high school science teachers from the Department of Defense Worldwide School System spent an afternoon with us. This year, a number of department faculty and students spent a day in a State College Middle School conducting Project Flask. Read more about this event in the following article. Also this year, the Nittany Chemical Society ran a day long, hands-on chemistry demonstration and workshop for children at a local shopping mall.

PROJECT FLASK

ON APRIL 11TH 2001, Project Flask presented an Earth Day Program to 130 third and fourth grade students at Park Forest Elementary School in State College, PA. The program, entitled “Don’t ___ CONTINUED ON PAGE 23
The individuals and companies listed on these pages have generously supported the Department of Chemistry either by donating directly to the department or to an individual faculty member’s research.

We are very fortunate that many of you make donations in various amounts directly to the Department of Chemistry. In these times of decreasing support from the State of Pennsylvania and increased difficulty in obtaining federal funds, contributions to the department are increasingly important.

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George Hoenshel Fleming
(B.S. ’30, Ph.D. ’36) Died October 20, 2000, at 93. Dr. Fleming was Professor Emeritus of Chemistry. He received a Ph.D. and bachelor’s degree in chemistry from Penn State University and a master’s degree in chemical engineering from the University of North Carolina at Chapel Hill. He was instrumental in establishing one of the nation’s first and finest departments of microanalytical chemistry. He taught and conducted research in chemistry at Penn State for 30 years until his retirement in 1964. First in 1961 and again in later life, he was cited for his work by the International Symposium of Microchemical Techniques. He was involved in the production of the first organic compound containing heavy hydrogen and in the early development of the production of penicillin. In 1945, in the midst of his teaching career, he and his wife founded Nittany Scientific Service Inc., designing and manufacturing precise and highly sophisticated scientific equipment for the university and industry, including the Penn State forage sampler used by farmers internationally to sample baled forage for nutritional content. He was a member of the American Chemical Society, Alpha Chi Sigma, Beta Kappa and the Penn State Alumni Association.

Frederick W. Lampe
Died November 8, 2000, at 73. Dr. Lampe was Professor Emeritus and a former head of the Department of Chemistry at Penn State. He earned his bachelor’s degree at Michigan State College in 1950 and his master’s and Ph.D. in chemistry at Columbia University in 1951 and 1953 respectively. He joined the Penn State faculty as an associate professor in 1960. He was promoted to full professor in 1965 and became assistant head of the department in 1978. He served as Head of the Department of Chemistry from 1983 to 1988 and retired as Professor Emeritus in 1992. He contributed more than 160 research papers and held five patents. He was a member of the American Chemical Society, Sigma Xi scientific honorary, a fellow of the American Physical Society and served on the board of directors of the American Society of Mass Spectroscopy from 1981 to 1983. After retirement, Dr. Lampe continued to serve as a consultant with the National Institutes of Health and was working with Dr. Harry Alcock, Evan Pugh Professor of Chemistry, Penn State to prepare the third edition of their book, Contemporary Polymer Chemistry. He will be greatly missed by colleagues, family and friends.

Thomas Saylor Oakwood
(M.S. ’30, Ph.D. ’37) Died April 4, 2001, at 91. Dr. Oakwood was Professor Emeritus in Chemistry. While teaching Chemistry at Vassar College in 1932, he met his future wife, Isabel Mills also a chemistry professor. They were married in 1939 and both taught chemistry at Penn State.

H. Gilbert Ralston
Died April 23, 2001, at 78. Mr. Ralston worked in the Chemistry Department, as a stockroom supervisor, retiring after 23 years of service at Penn State.

James A. Weiss
(Ph.D.’71) Died on March 26, 2001. Dr. Weiss was an assistant professor of chemistry at Penn State Worthington Scranton for 31 years. Jim received his bachelor of science degree in chemistry from the University of Wisconsin and a Ph.D. in chemistry from Penn State. He joined the Penn State faculty in September, 1970 and taught general chemistry and organic chemistry, as well as distance education courses for the University. Most recently, he was awarded the 2000 Campus Advisory Board Award for Excellence in Teaching. The award recognizes a faculty member who has demonstrated innovative and dedicated teaching techniques in his or her academic endeavors. Jim was a member of the American Association for the Advancement of Science, American Chemical Society and Sigma Xi. He is credited with numerous abstracts and papers related to his research and was Merrill Richard Klingler
(B.S. ’52, Ph.D. ’53) Died October 5, 1999. He is survived by his wife Alice Ann, sons Richard and Dan, and granddaughter Aubry.

Robert L. McLaughlin

George S. Olshanksy
(B.S. ’34) Died in early December 1999.
all the best in everything they do. May they always succeed and make us Penn State proud for their time with us.

Of course, as we grow we need to improve the facilities we use. Over the years, as we have grown to one of the nation’s premiere departments, our facilities have been repeatedly inadequate for our combined missions. Chandlee laboratory is becoming unsafe with serious ventilation issues and the department is currently spread over five buildings on central campus and at the Research Park. To meet the obvious needs of the department a new building is just finishing the planning stages under the expert guidance of Barbara Garrison and the Building Design Committee. Ground breaking is expected this fall with an anticipated construction time of two years. I cannot tell you how excited we are about his project and how much it will mean to the department!

The faculty have again garnered many awards and we are extremely proud of them. Read about them in the Awards section of the Newsletter. Several of the staff have also been honored and I would like to honor them again here. In 2000, Theresa Peters won the Ebelyr College of Science Staff Award for Excellence and Eric Younken was given the Chemistry Staff Excellence Award. Ken Shope was honored for 25 years of service, while Connie Boob, Dana Coval-Dinant and Rod Kreuter were honored for 10 years. Congratulations to all!

We welcome new staff assistants Joannie Hosband, Amy Luzier, Natalie Willis, Teresa Beck and Cindy Anders. Albert Rozo joined the department this spring as our first full-time, and much needed, web coordinator. Last but not least, Ken Brown is new in the Stockroom. On any future visits to the department, I am sure all these new staff will join the rest of us in making your visit a pleasant one.

Staff that have been promoted recently include Connie Smith, Judy Flynn and Amy Luzier to Staff Assistants Grade VII, Greg Wert to Stockroom Supervisor and Dave O’Neill in the Maintenance Shop to Grade 4 Technical Service. Congratulations to all on great service that we are happy to be able to recognize.

In related news, I last reported on the aquatic ecosystems given to the HUB-Robeson Center by the Class of 1999. These are up and running and are maintained, in part, by Bob Minard and crew. They are truly stunning and any visit to the HUB should include a stop to view these great displays of underwater nature.

As you can see, the Chemistry Department continues to be extremely active. The new building, new hires and new students are all helping to keep us on a positive slope towards being a truly great department. All these people make writing this column easy and delightful. Please keep in touch. It is as easy as http://www.chem.psu.edu. As always, we wish you well and appreciate your support.

Be An Ecogrinch,” was the result of a collaborative effort between Project Flask and the faculty of E Cluster at Park Forest Elementary School (PFE). The goal of the presentation was to develop a curriculum that would support a plant and animal science unit for these two grade levels. Jackie Bortiatynski, Chemistry Instructor and Andrew Greenberg, Chemistry Education designed the program to engage students in a series of demonstrations that integrate plant and animal studies with environmental science. The demonstrations focus on taxonomy, animal/plant form and function, pollution, ecosystems/integrated pest management and population control. Some of the activities the children participated in were the demonstration of a wet scrubber, an oil spill, the toxicity of household chemicals using brine shrimp, a marsh ecosystem food web, the composition of egg and sea shells and an interactive computer program designed to demonstrate population growth.

I hope that I have been able to impart some of the enthusiasm and excitement that I have for these new projects. I look forward to working with faculty, students, staff and alumni in an effort to create an environment that nurtures excellent research and teaching.
UPCOMING EVENTS
Here are some events where you will have the opportunity to meet fellow alumni, faculty and staff. Please join us.

ACS NATIONAL MEETING
AUGUST 26-30 CHICAGO, IL

CCR ANNUAL MEETING
SEPTEMBER 22-25, CINCINNATI, OH

MARKER SYMPOSIUM
SEPTEMBER 25, UNIVERSITY PARK, PA

JOSEPH PRIESTLY HOUSE HERITAGE DAY
OCTOBER 14, NORTHUMBERLAND, PA

GROUND BREAKING FOR NEW CHEMISTRY BUILDING
OCTOBER 19, UNIVERSITY PARK, PA

SPONSORS DAYS
OCTOBER 17-19, UNIVERSITY PARK, PA

HOMECOMING
NOVEMBER 3, UNIVERSITY PARK, PA

Department of Chemistry
The Pennsylvania State University
152 Davey Lab
University Park, PA 16802-6300
1-814-865-6553

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