Dear Alumni and Friends:

I am delighted that Chemistry remains preeminent within Penn State and in the academic world at large. We were ranked 16th among the chemistry graduate programs by U.S. News & World Report this year. Chemical & Engineering News ranked us 4th nationwide in chemical R & D spending. The faculty and students continue to collect awards and honors, and their research is highly cited. There were several promotions this year. Chris Keating and Mary Beth Williams became associate professors with tenure; Phil Bevilacqua, Juliette Lecomte, and Karl Mueller were promoted to full professors. I am sure that you will join me in congratulating them.

This was also a bumper year for recruitment of new faculty. Lasse Jensen, Tae-Hee Lee, and Will Noid joined the Department as associate professors and we managed to lure away Ray Schaak from Texas A & M University as an associate professor. Squire Booker, Marty Bollinger, and Carsten Krebs moved from Biochemistry & Molecular Biology to 75% Chemistry. Finally, Bratoljub Milosavljevic joined us as the director of the physical chemistry laboratory. We welcome them all. Juliette Lecomte and Chris Falzone moved to Johns Hopkins this fall and will be missed. This year, we will be searching for new faculty in the general areas of synthesis, biological chemistry, and NMR spectroscopy.

Our beautiful building now has a new focal point. Thanks to the generosity of a group of alumni, friends, and faculty, a series of three paintings, Song Cycle by Alexis Portilla, was installed in the atrium. These are the first artworks specifically commissioned by a department at Penn State.

All the exciting work going on in the Department would not have been possible without a dedicated and hard working group of staff members. They too have won their share of awards and recognition. We welcome Lacey Rigg and Amanda Royer as our newest staff assistants, and Phil Stemple as the Department’s new lecture demonstration specialist. On the down side, Rick Smalley, stockroom inventory clerk, retired and Mike Hand, network system administrator, moved from Chemistry to the Huck Institutes for the Life Sciences. Saddest of all was the untimely passing away of Karen Sue Heichel, staff assistant in the undergraduate programs office. They will all be missed.

Great faculty, a talented group of students and postdoctorals, and helpful staff: these are the key ingredients for a great Chemistry department. And it is this combination that makes this such a vibrant place. As I start my fourth year as department head, I feel truly fortunate to be here. My one wish is that you share our pleasure and excitement by visiting us next time you are in the area. As the next best thing, please keep in touch at our newly revamped website: http://www.chem.psu.edu. We would love to hear from you.
Nearly seven hundred K-12 summer camp students, twenty Upward Bound students, twelve young participants of the Four Diamonds Child’s Wish Program, and many undergraduates, graduate students, professors, and local educators: Dr. Jacqueline Bortiatynski, Director of Instrumentation and Lecturer for the Chemistry Department, has a role in directing all of them. Bortiatynski is the Associate Director for the Action Potential Science Experience and participates in the Summer Experience in the Eberly College of Sciences (SEECOS) program with Upward Bound. She is also heavily involved with two student organizations: the Nittany Chemical Society (student affiliate group of the American Chemical Society) and Alpha Chi Sigma (the chemistry fraternity). Both of the student organizations participate in outreach programs such as: a public Halloween show; Central Pennsylvania Festival of the Arts; Space Day and the Four Diamond’s Child’s Wish Program.

Bortiatynski says that her commitment to outreach programs is “…really about getting people excited about science and recognizing it’s there and it’s an integral part of their life even if they have not seen it from that perspective…. it’s also about critical thinking and problem solving. Everybody needs that skill, that’s not just exclusive to scientists.”

The summer science camps are offered through Action Potential Science Experience, a six-week program designed for kindergarten through senior high school students of all levels. Not only do the science camps benefit the student participants, but they also impact all the individuals that make the camps happen. Undergraduate and graduate students act as mentors, assist with curriculum and development, and teach. Faculty members such as Tom Mallouk help develop material for the programs. Local educators teach the program participants. Undergraduates are hired to prep all the labs. Action Potential also provides an opportunity for recipients of grants to satisfy their outreach requirement. “I look at it as a total K-12 package, I don’t look at it as just the kids coming to camp because there are so many connections that the program makes in a lot of unique ways,” Bortiatynski said.

“Within the camps there’s no restriction,” Bortiatynski said, “it’s not that these camps are only offered to kids recommended by teachers, or that these kids have very specific abilities, there is no discrimination on any level. We’re talking a very broad range of abilities and experience and it’s really about science literacy…If you can make it relevant, if you can make it interesting, you can teach anybody science, they just have to have the want,” Bortiatynski said, “and so if we’re really going to make science literacy an important part of the fabric of the educational system we have to find ways, and as scientists I think that’s part of our charge, to find ways to get people excited and to connect, and make them aware of all these things that are there and part of their life.”

SARAH BRUNKER

Above: Visitors to the Chemistry is Magic exhibition at the Central Pennsylvania Festival of the Arts. Photo J. Keighton & L. Dominak.

Left: Student researchers in the summer 2007 Project WISE (Women in Science and Engineering) class weighing material for an experiment.
A Computational Chemist Looks at Biological Questions

Using a combination of theoretical and computational chemistry, Sharon Hammes-Schiffer’s research group seeks to gain a better understanding of how enzymes work and how protons and electrons interact. Trained as a physical chemist in formal theory, Hammes-Schiffer was exposed to experimental biophysics in graduate school but decided it wasn’t for her. “When I started my independent career, it seemed natural to apply what I learned in fundamental physical chemistry to biological questions.” Hammes-Schiffer works closely with experimentalists and says that “our goal is to first reproduce their (the experimentalist’s) data and then to go beyond that and provide new insights, which can help them in turn design new experiments, which can provide deeper insights.”

One of her research projects centers on proton and hydride transfer reactions in enzymes. In this collaborative effort with Steve Benkovic, Hammes-Schiffer says “the questions that we’re trying to understand are: what is the role of hydrogen tunneling in enzymes, and, more importantly, what is the role of enzyme motion in catalysis?” Through a combination of experiments and theory, Hammes-Schiffer says that they have found that “it is actually conformational sampling of the enzyme that gets everything in place for the chemical reaction, which happens very quickly.” They have also studied how making mutations in the enzyme can affect the structure and motion of the enzyme, as well as the catalytic rate of the chemical reaction. This project has relevance to basic applications of protein and drug design.

Another of her research projects involves proton-coupled electron transfer, in which a proton and an electron transfer simultaneously in a single step. “What we want to understand is how the electron and the proton move together and how the environment affects the reaction,” says Hammes-Schiffer. Her group is also looking at the kinetic isotope effect (i.e., the ratio of the rate with hydrogen to the rate with deuterium), and is collaborating with experimentalists who measure magnitudes and temperature dependences of kinetic isotope effects. “We want to understand the mechanisms of these types of reactions, which are relevant to electrochemistry, fuel cells, and solar energy. If we can understand the details of how the protons and electrons move, then maybe we can design better fuel cells.” She also said that this work is relevant to biology, and that “a lot of enzymes and biological processes such as respiration and photosynthesis involve not just electron transfer or proton transfer but both of them, and they’re very strongly coupled. Very little theory has been done on these types of reactions, and we’ve developed a general theoretical framework for understanding what we call proton-coupled electron transfer.” Hammes-Schiffer said that “the goal is to understand the detailed mechanisms and then to be able to design materials and understand biological systems and how they work so we can better control them.”

Hammes-Schiffer enjoys working at Penn State, of which she says, “being in a department with people who have similar interests in science is very stimulating and enjoyable.” When asked about being a successful working mom, she said “It is challenging to balance my family and work obligations, but I would never trade my family life for anything.”

LISA DOMINAK

Above: Schematic diagram of a portion of a network of coupled motions in the enzyme dihydrofolate reductase. The yellow arrows and arc indicate the coupled motions. This picture does not represent a complete or unique network but rather illustrates the general concept of reorganization of the enzymatic environment to provide configurations conducive to the hydride transfer reaction.

Left: Sharon Hammes-Schiffer, Eberly Professor of Biotechnology.
Featured Research

Natural Products from the Laboratory

For years, synthetic chemists have provided humanity with methodologies and chemical precursors for the synthesis of compounds that were previously only available from natural sources such as plants, animals and fungi. Steven Weinreb, the Russell and Mildred Marker Professor of Natural Products Chemistry, is at the forefront of this field and has left a lasting impression on the world of synthetic chemistry. His prominence in the discipline is such that in the summer of 2006 a special symposium was held at the Penn State University Park campus to honor his contributions to the field of total synthesis of heterocyclic natural products. The term “total synthesis” refers to the process of manipulating common chemical compounds towards the goal of creating a product otherwise unavailable, except from its biological source. “If you think about it, all natural products begin with water and carbon dioxide,” Weinreb explains. “While we don’t go all the way down to those basics, we still try to develop techniques that allow us to start with simple, commercially available materials.”

Weinreb stresses that in most of his research, the development of the method used to create the desired natural compound is often more important, and interesting, than the product itself. “Discovering how to synthesize a potentially useful compound is very compelling, but by developing new synthetic techniques, we have the opportunity to apply those methods to future syntheses of many other products.” Weinreb’s most recognized creation, known as the “Weinreb amide”, is clear evidence of his scientific approach. The Weinreb amide (R-C\(_3\)O\(_2\)H\(_6\)N) is a highly stable, highly efficient molecule used in the synthesis of ketones from their acid derivatives, a reaction which is frequently used in the total synthesis of various important biomolecules.

Recently, the group has been delving more into the syntheses of natural products possessing high potential for medicinal applications in the fields of cancer research and neurodegenerative diseases. One such project involves the total synthesis of ageladine A. This compound was previously only found in a type of sponge that lives off the coast of Japan. In preliminary biological studies, ageladine A demonstrated potential applications in inhibiting angiogenesis, the process of growing new blood vessels from pre-existing ones. Angiogenesis has been identified as one of the main factors in tumor growth. Thus, the ability to synthetically produce ageladine A without having to harvest it from nature will greatly aid to further research into its medicinal potential in the prevention of tumor growth.

Another molecule currently under investigation is actinophyllic acid, which Weinreb describes as a “unique alkaloid with interesting cardiovascular activity”. More specifically, actinophyllic acid has been found to facilitate fibrinolysis, which is the process of breaking down blood clots so that they may circulate through the human body and be cleaned out by the liver and kidneys. Drugs of this type are often prescribed for those who have suffered either a heart attack or stroke. The ability to synthesize this molecule in the lab will allow medical researchers to fully realize the potential applications of this valuable compound.

DANIEL BLUMLING

Steve Weinreb (right) was honored by former students at a special symposium held during the summer of 2006. Shown with Steve are Sid Hecht and Matt McIntosh.
Awards

Faculty & Staff

Harry Allcock was selected as the recipient of the American Chemical Society National Award in Applied Polymer Science. The award was presented at the Chicago ACS meeting in the Spring of 2007. The Journal of Inorganic and Organometallic Polymers and Materials dedicated a special issue to Harry and his contributions to science (Vol. 16, No. 4, December 2006).

Robert Bernheim has been appointed Chairman of the Physical and Mathematical Sciences panel for the Ford Fellowship Program.

Will Castleman received his third U. S. Senior Scientist Humboldt Award. Rensselaer Polytechnic Institute also honored Will with the Thomas W. Phelan Fellows Alumni Award.

Michael DeRosa, professor of chemistry at Penn State’s Delaware County Campus, was named a recipient of the 2006 Distinguished Service Award from the Eberly College of Science. He joined Penn State as an associate professor in 1989 and was named full professor in 1994. Michael has been involved in efforts to obtain funding for a multidisciplinary science studio to enable the sharing of technology for the teaching of physics, chemistry, and biology laboratories. He is well known as a mentor who empowers his students.

Sharon Hammes-Schiffer’s article, Hydrogen Tunneling and Protein Motion in Enzyme Reactions, published in Accounts of Chemical Research was featured on the ACS publications website as a 2006 Most-Cited Article based on citation data obtained from Thompson ISI. The ACS stated, “2006 Most-Cited Articles are articles published in 2006 receiving the most citations in the same year.”

Mike Hand, System Administrator in the IT group, has received the first Wheeler P. Davey Award. This award was established to recognize the contributions by scientific and technical staff members in the Department of Chemistry. Mike played a key role in moving into the new building, was a vital component in the effort to reorganize the Department’s web site and has been the creative force behind the new on-line graduate student evaluation database.

Carsten Krebs has been selected to receive the Pfizer Award in Enzyme Chemistry. Carsten will receive the honor at the national meeting of the American Chemical Society to be held in Philadelphia in 2008.

Tae-Hee Lee has received a Camille and Henry Dreyfus New Faculty Award. Recipients of this honor are selected on the basis of evidence that they have the potential to produce an independent body of scientific scholarship of outstanding quality and will make significant contributions to overall education in the chemical sciences.

Tom Mallouk was selected as the recipient of the fifth Annual Priestley Prize for Outstanding Teaching in Chemistry. (see the article about Tom on page 9) In addition, Tom was elected a Fellow of the American Association for the Advancement of Science. Election as a Fellow of AAAS is an honor bestowed upon members by their peers. Fellows are recognized for meritorious efforts to advance science or its applications.

Tom was also selected as the 2008 recipient of the ACS Award in the Chemistry of Materials. According to the ACS, in the selection process “particular emphasis will be placed on research relating to materials of actual or potential technological importance, where a fundamental understanding of the chemistry
associated with materials preparation, processing, or use is critical”.

Kate Masters received the 2007 Outstanding Professor Award from the Penn State chapter of Alpha Chi Sigma. This award recognizes faculty members who have made a significant impact on the lives of students.

Theresa Peters, Administrative Manager, has been selected as the 2006 Eberly College of Science Leadership Award winner. This award serves to “honor a staff member or team who demonstrates leadership, high standards of performance, and serves as a positive role model for others.” At the awards ceremony Ayusman Sen praised Theresa’s organizational abilities, knowledge of the Penn State human resources system and her dedication to the Department. Theresa also received her rocking chair in recognition of 25 years of service to the University.

Blake Peterson was elected Honorary Member of the Editorial Board for the journal Perspectives in Medicinal Chemistry.

Ray Schaak has received an Alfred P. Sloan Research Fellowship and a Camille Dreyfus Teacher-Scholar Award. According to the Sloan Foundation, selection procedures for the Research Fellowships are designed to identify those who show the most outstanding promise of making fundamental contributions to new knowledge.

The Camille Dreyfus Award recognizes Ray’s excellence in research and education. The award will support Ray’s work on “Chemical Strategies for the Synthesis of Multi-Metal Nanomaterials: Exploring Uncharted Territory in the Synthesis of Metalurgical Solids.”

Ray was also the recipient of a National Science Foundation CAREER Award, a Beckman Young Investigator Award, and the DuPont Young Professor Award.

Connie Smith was recipient of the 2006 Eberly College of Science Research Staff Support Award. This award is intended to “honor a staff member or team whose dedication in providing staff support to a research group or project is invaluable.” In his remarks during the presentation ceremony, Will Castleman stated “Connie Smith is by far the very best administrative assistant I have had the pleasure of working with during my entire career.”

Paul Weiss has been appointed editor of ACS Nano, a monthly journal about nanoscale science and technology that will begin publication in third-quarter 2007. Paul also received a 2007 Outstanding Professor Award from Alpha Chi Sigma.

Mary Beth Williams was appointed to the Defense Science Study Group (2008-2010). The DSSG selects young faculty members from many of the nation’s top universities to participate in a two-year program that focuses on defense policy; related research and development; and the systems, missions and operations of the armed forces. Mary Beth also received the 2007 Young Investigator Award from the Society for Electroanalytical Chemistry at a special awards symposium at Pittcon.

Student

Pat Conforti, a member of the Garrison group, received the Outstanding Student Poster Award at the 5th International Conference on Photo-Excited Processes and Applications, 2006, held in Charlottesville, VA.

Jocelyn Edathil received one of two Rohm & Haas Graduate Student Travel Awards. Jocelyn is a member of the Peterson research group.

Jack Flicker, a summer 2006 Penn State graduate with a B.S. in Physics and Chemistry,
has been selected as the recipient of the 2006 PennACE (The Pennsylvania Association of Colleges and Employers) JoAnne Day Co-op Student of the Year award.

Elizabeth Gratton, a junior chemistry major, has been awarded the Jean Dreyfus Boissevain Undergraduate Scholarship for Excellence in Chemistry. The Dreyfus Foundation provides this award as a stipend for an exceptional undergraduate to carry out chemistry research with an active faculty member who will serve as a mentor. Phil Bevilacqua will serve as mentor for Elizabeth.

Andrew Latham has been awarded a Graduate Fellowship from the American Chemical Society Division of Analytical Chemistry. Andrew is a member of the Williams research group.

Carolyn Lubner has been selected by the U.S. Department of Energy for the 2007 meeting of the Nobel Laureates and Students in Lindau, Germany. Carolyn is a member of the Golbeck research group.

Rebekah McLaughlin, a senior chemistry major, has been awarded a Gates Cambridge Scholarship to support her graduate studies at Cambridge University, U.K.

Amanda Moore won the national Iota Sigma Pi Anna Louise Hoffman Award for Outstanding Achievement in Graduate Research. Amanda also received a Rohm & Haas Graduate Student Travel Award. Amanda is a member of the Weiss group.

T J Mullen of the Weiss group received the 2007 Rustum and Della Roy Innovation in Materials Research Award. TJ has also been awarded a Graduate Fellowship from the American Chemical Society Division of Analytical Chemistry.

Christin Palombo was a first place winner for her poster in the Penn State Computation Day, 2006. Christin is a graduate student in the Garrison research group.

Mike Russo (Garrison group) and Leiliang Zhang (Winograd group) received Student Travel awards from the conference to give talks at the 44th IUVSTA Workshop on Sputtering and Ion Emission by Cluster Ion Beams, 2007.

Isaac Shomer, senior chemistry major and graduate of the Schreyer Honors College, was the Chemistry Department’s standard-bearer at the May 2007 commencement ceremony.

Kari Stone, a member of the Green group, received the 2007 Schering-Plough Science and Innovation Award. Schering-Plough established this award to recognize and promote academic excellence in analytical chemistry. Kari traveled to Schering-Plough with her advisor to receive a $5,000 check and to participate in a symposium with other Science and Innovation Award winners.
Mallouk Awarded 2007 Priestley Prize for Teaching

Tom Mallouk (left) with previous recipients of the Priestley Prize for Excellence in Undergraduate Teaching (left to right) Chris Falzone, John Lowe and Bob Minard. Pshemak Maslak (2003 winner) was not present.

“The Priestley Award is a real honor to me,” says Dr. Thomas Mallouk, DuPont Professor of Materials Chemistry and Physics and the most recent recipient of the prestigious teaching award. “The award depends on recommendations and testimonials from students, who, I guess, think I’m doing something right. When I look at people who have won this award before, they’re people for whom I have tremendous respect.” Initiated in the spring of 2003, this award is given to one outstanding teacher of undergraduate chemistry courses each year, alternating between tenure and nontenure track faculty. Previous recipients of the award are: Pshemak Maslak, Bob Minard, John Lowe and Chris Falzone.

Two results are listed as essential in order to receive the Priestley Award: the increase of both learning and enthusiasm in the classroom. Mallouk accomplishes these by including demonstrations and jokes to “keep the class awake and engaged, and the other thing that is really important is to challenge the students to learn independently. Most of our actual learning really doesn’t occur by listening, you have to do your own. Teachers need to set that up, to inspire their students to make that effort.”

Mallouk began his teaching career at The University of Texas at Austin and has been teaching at The Pennsylvania State University since 1993, where he has taught general chemistry (both the larger sections and the smaller honors sections), inorganic chemistry, solid state chemistry, and electrochemistry. While having stated that the honors freshman class is the most work, Mallouk explained that it is also the most fun to teach. “The students come to every class, and they do all the work. At the end when they write their evaluations, they say things like ‘Wow this course was really hard, but I sure learned a lot.’”

When asked about his philosophy of teaching Mallouk said, “…this is really what the University is about. We’re here essentially to mentor the next generation of scientists who will take over from us”. In order to improve his teaching even more in the future, Mallouk “would like to figure out a way to make the learning experience less passive, have [the students] take more ownership.”

Teaching gives Mallouk the opportunity to engage students’ optimistic attitudes in the classroom, explain concepts clearly to people who are not experts, and “to paraphrase Richard Feynman, the nature of research is kind of one step forwards, two steps back. There’s a lot of failure in research. There are great moments, but in between them there are long stretches of nothing and during those times you can actually have a tremendous amount of doubt about yourself. We all have those moments, and what Feynman said was at those times if you’re teaching and doing a good job then you can still feel good that you’re making an important contribution. I think that’s really true.”

SARAH BRUNKER
The Department of Chemistry welcomes eight new faculty members this fall, five experimentalists, two computational/theoretical chemists and a new member of the chemical education group.

Marty Bollinger, Squire Booker and Carsten Krebs (formerly adjunct members of the Chemistry Department) will move to new labs in the Chemistry Building. Joining Chemistry colleague Mike Green, these faculty members will form the core of a new center of excellence that will focus on metalloenzymes.

Ray Schaak, joining us as a tenured associate professor, was previously in the Department of Chemistry at Texas A&M University. The Schaak research group is working to develop new synthetic strategies for rationally designing complex nanocrystals and solid-state materials.

Lasse Jensen will develop new theoretical methods for understanding molecular systems of broad interest in many areas of physical chemistry, biochemistry and nanoscience. Our other new computational chemist, Will Noid, will establish a research program using computational techniques and theories from statistical mechanics to investigate the structure and dynamics of unfolded proteins.

Tae-Hee Lee uses single molecule biophysical methods to monitor and control the dynamics of enzymatic reactions in order to study the molecular mechanism of several important enzymatic processes such as translation, DNA damage repair and tRNA synthesis.

Bratoljub Milosevlicic is the new Director of Physical Chemistry Instructional Laboratories.
for Tissue Engineering and Drug Delivery,” which was issued this summer. He was invited to participate in an ACS Presidential Symposium at the ACS fall meeting in Boston to celebrate the 40th Anniversary of the founding of the journal, *Macromolecules* and was recently cited as one of the most prolific authors worldwide to publish in that journal. Harry continues to serve on the editorial advisory boards of *Chemistry of Materials* and *The Journal of Inorganic and Organometallic Polymers and Materials*, and *Inorganic Syntheses*.

**Jim Anderson** was granted a continued Humboldt Award by the Alexander von Humboldt Foundation for a year of research in Germany. He plans to collaborate in work in Quantum Monte Carlo methods with Arne Luechow at Aachen University during the fall term 2007. He has begun research in two new areas: mitigation of IED damage, reaction kinetics in multiple-enzyme systems with fluctuations. Jim is the author of a newly published book, *Quantum Monte Carlo: Origins, Development, Applications*, published by Oxford University Press. The book describes an advanced method in quantum mechanics for treating a wide range of problems in science, engineering, and medicine.

**Steve Benkovic** was the 2006 Royal Centenary Lecturer and was also the Oakley R. Vail Lecturer at Wake Forest University. Among his invited talks was a stop at University College London, U.K., where he participated in the Second Institute of Structural Molecular Biology. Steve’s research generated fourteen publications in refereed journals.

**Phil Bevilacqua** reports that he “had the pleasure of speaking last summer at the 60th birthday celebration of my thesis advisor, Professor Doug Turner, and will speak this coming summer at the 60th birthday celebration of my postdoc advisor, Professor Tom Cech.” Phil traveled to Kobe, Japan to speak at the Second International Symposium on Biomolecular Chemistry (ISBC2006). Phil also spoke at the Santa Fe Institute Workshop: Nucleic Acids – The First Billion Years as well as the national meeting of the American Chemical Society in Chicago. Notably, Phil was promoted to professor of Chemistry.

**Will Castleman** participated in the SFB seminar at the Freie University of Berlin, Germany and was a colloquium speaker at the Institute of Molecular Sciences, Okazaki, Japan. He also delivered a talk at the 15th Symposium on Atomic, Cluster and Surface Physics, Obergurgl, Tirol, Austria. Will organized a special feature section of the *Proceedings of the National Academy of Sciences* dealing with Cluster Chemistry and Dynamics. His group’s work on superatom building blocks of nanoscale materials became the subject of numerous news articles. Will was elected Vice-Chair of the Division of Chemical Physics, American Physical Society and serves as Councilor to the Director General of the Institute for Molecular Sciences of Japan.

**Andy Ewing** was awarded a Marie Curie Chair by the European Union to visit Sweden for up to three years and began a partial leave of absence in May 2007. In August 2006 Andy traveled to Copenhagen, Denmark to present a paper at the 26th International Symposium on Chromatography.

**Mike Hand**, Network System Administrator since 2003, has resigned from Chemistry in order to accept a position with Penn State’s Huck Institutes for the Life Sciences. Mike was admired for his technical skills and engaging personality.

**Barbara Garrison** is in her fifth and final year as an officer in the PHYS Division of the American Chemical Society. During this time, she attended two national ACS meetings per year. During the past year she has given invited talks at international meetings in Konstanz, Germany and Edinburgh, Scotland and at national ACS meetings in Chicago and Boston.

*Ayusman Sen (left) presents Mike Hand with the 2006 Wheeler P. Davey Award for Excellence in Technical Staff Support.*
Sharon Hammes-Schiffer gave more than twenty talks at universities and conferences, including five different Gordon Research Conferences and an international molecular quantum mechanics conference in Budapest. She published numerous papers on a wide range of topics, such as the role of protein motion in enzyme catalysis, proton-coupled electron transfer, and new methodological developments for quantum mechanical studies of electron-proton interactions. She is a co-organizer of the symposium entitled “Quantum Mechanics and Statistical Mechanics: Can One Avoid the Other?” for the American Chemical Society National Meeting in August, 2007.

Mike Joyce, Staff Assistant in the Undergraduate Programs Office, has been promoted to Staff Assistant VI.

Juliette Lecomte was promoted to Professor of Chemistry.

Tom Mallouk delivered nineteen invited talks to university and industry audiences throughout the United States and overseas. These included the Treat B. Johnson Lecture at Yale University, the McGavock Lectureship at Trinity University, a talk in the Invitational Lecture Series at UOP, and a plenary lecture at the 16th International Conference on Photochemical Conversion and Storage of Solar Energy in Uppsala, Sweden. His research resulted in the publication of thirteen articles in refereed journals. The Materials Research Institute cited Tom’s work on catalytic nanomotors, carried out in collaboration with Ayusman Sen and his group, as a “Milestone of Nano at Penn State.” Tom continues to serve as an associate editor for the Journal of the American Chemical Society and as Director of the Center for Nanoscale Science, a National Science Foundation funded MRSEC at Penn State.

Karl Mueller delivered nine lectures at universities and meetings this past year, including the 2007 Varian Lecturer at the University of Ottawa. He also continues to lead the Penn State Center for Environmental Chemistry and Geochemistry, a cross-disciplinary center focused on research and education in environmental chemistry. Karl developed and taught a course this past year on Cyber-Enabled Chemistry, where students learned about such diverse topics as web administration tools, on-line chemical collaborators, building of databases, and three-dimensional visualization tools. Karl was promoted to Professor of Chemistry.

Blake Peterson co-chaired the 2007 Gordon Conference on Bioorganic Chemistry. He presented invited seminars at The New York Academy of Sciences (Chemical Biology Discussion Group), Brown University, University of California, Santa Barbara, University of Kansas, Syracuse University, Mount Sinai School of Medicine, Virginia Tech, Penn State Hershey Medical Center, and University of West Florida.

Lacey Rigg is the newest member of the Undergraduate Programs Office. Lacey will be working as a Staff Assistant supporting the instructional laboratories. Lacey is a graduate of Penn State Altoona where she received an associate’s degree in Business Administration. This is her first job at Penn State University Park.

Amanda Royer joined the Department as a Staff Assistant. Amanda’s primary task is to coordinate all seminars and colloquia. Amanda will also assist in the Undergraduate Programs Office. Amanda is a Penn State graduate (’05, English) and was previously employed by Paradise [sic] Pools and Spas.

Ray Schaak joined the Department in August 2007 as an associate professor of Chemistry. During the past year Ray delivered twenty invited talks at universities, companies and scientific meetings including two Gordon Research Conferences and the Trans-Atlantic Frontiers of Chemistry Conference. Ray’s research group generated twelve publications in peer-reviewed...

Ayusman Sen delivered numerous invited talks to academic and corporate audiences throughout the United States with additional stops in Korea and India. The Materials Research Institute cited Ayusman’s work on catalytic nanomotors, a collaborative effort with Tom Mallouk, as a “Milestone of Nano at Penn State.” Ayusman’s research resulted in the publication of seventeen articles in refereed journals. Dan Larson, Dean of the College of Science, convinced Ayusman to serve an additional three years as Department Head.

Rick Smalley, Stockroom Inventory Clerk in Chemistry for fifteen years, has retired from the University. Rick served at Penn State for more than 25 years. He was known for his friendly manner and his willingness to help all, especially the graduate students.

Phil Stemple is the Department’s new Lecture Demonstration Specialist. In addition to creating the special effects for the undergraduate lecture sessions, Phil will also help with Outreach and special events such as the annual Halloween magic show.

Steve Weinreb was honored at a special symposium held at Penn State in August 2006. Several distinguished visitors from academia and the corporate world traveled to University Park to celebrate Steve’s 65th birthday. In addition, the journal Heterocycles published a special edition (Volume 70, December 2006) containing 63 papers contributed from organic chemists worldwide. Steve’s research resulted in the publication of twelve papers in refereed journals as well as two book chapters.

Paul Weiss gave the Levine Lectures at the University of Pittsburgh Department of Chemistry and was an Eminent Scholar Lecturer at the University of Arizona. He also gave invited or plenary talks at: the 2006 International Conference on Nanoscience and Technology in Basel, Switzerland; the International Workshop on Quantum Measurement and Manipulation at the Molecular Scale in Hefei, China; the Mesilla Chemistry Workshop on Electron Transfer and Molecular Devices in Mesilla, NM; the Institute for Materials Research Workshop on Advanced Materials in Sendai, Japan; PittCon in Chicago, IL; the ACS meetings in San Francisco, CA and Chicago, IL; the Foundations of Nanoscience Meeting in Snowbird, UT; the Nanoscience and Nanotechnology for Biological/Biomedical/Chemical Sensing Engineering Conference International in Hong Kong; the International Scanning Probe Microscopy Conference on Jeju Island, Korea; Hong Kong University; Hanyang University in Seoul, Korea; Seoul National University in Seoul, Korea; Trinity College Dublin in Dublin, Ireland; the University of California at Davis; the University of California at Riverside; the University of Rochester; the University of Texas at Austin; and the University of Texas at Dallas.

He helped organize: the Foundations of Nanoscience Meeting, of which he will now be Program Chair and Technical Co-Chair; Crossover at Penn State; Nanoscience and Nanotechnology for Biological/Biomedical/
New Painting

Chemistry Building Home to New Painting

In March, a committee composed of University faculty and staff commissioned New York-based artist Alexis Portilla to create artwork for the Chemistry Building atrium. The project was funded by donations given to the Department for the purpose of enhancing the new Chemistry Building for the enjoyment of users and visitors, and the work represents the most significant such investment in public art in the entire Penn State system. The finished piece, a three-panel painting titled Song Cycle, was hung in the atrium just in time for May’s graduation ceremony.

Before beginning work on the painting, the artist was given information about the building and its users, but was otherwise given broad latitude to express his artistic vision: “I knew the works would be seen from several vantage points in the lobby and that had a lot to do with the intense or saturated color used and the sharp-edged imagery. It had to look as interesting compositionally from 100 feet away as it did 20 feet away.” Though the art is abstract, Song Cycle includes imagery Portilla drew from forms and figures seen in chemistry. He explains, “I chose to use imagery directly from models in chemistry, atomic orbitals; imagery I found interesting visually. …it was paramount that a “connection” of some kind was fostered between the work and the students and faculty. …They have to see the work every day and it was very important to me that they enjoy it, discuss it, interpret it with each other and have fun doing so.” When asked how he would explain the painting to the “non-artists” who would view it, Portilla responds, “The images from bottom to top are evolving. …The shapes start out as definitive imagery (atomic orbitals) and then change into more ephemeral objects, then float away. …What makes abstract painting so interesting to me is the endless interpretation it has the potential to engage. No two people will see the same things in the work and that’s how I like it."

Alexis Portilla was born in Mexico City as a young child, where he continues to live and work. He received a B.F.A. from the Pratt Institute in Brooklyn in 1987, and an M.F.A. from Columbia University in 1990. His work has been shown in group and solo exhibitions throughout the U.S. and in Hong Kong, and it resides in the collections of over 250 private and corporate collectors including the New York Public Library, Norwest Partners, Sage Hill Partners, and many others.

ELISABETH VOSE

John Emigh (left) and Darren Dixon install Song Cycle in the atrium of the Chemistry Building.
We Can Do That

While many students, staff, and faculty utilize the Research Instrumentation Facility on the first floor of the chemistry building for routine maintenance and repair, few realize the treasures that lie behind these double doors. Rod Kreuter, who has worked at Penn State for more than seventeen years, is one such treasure. He and his staff are ready, willing and able to do much more than simply repair a broken hot plate.

In late 2005, Cary Supalo, a graduate student in Tom Mallouk’s research group, approached Rod for help. Cary wanted to develop a device to aid blind chemistry students. And he had a prototype. The prototype of the SALS (Submersible Audible Light Sensor) was pretty basic and had some shortcomings but like any engineer, Rod thought he could improve the current design.

Rod started the SALS redesign like many other projects: he talked it over with Bob Crable. Bob works with Rod and has a keen eye for a finished product. Bob knows what it takes to get something into a box and into students’ hands.

The new prototype mimicked all of the original functions but was smaller, lighter, much more reproducible, reliable and had more features. It also cost about one tenth as much as the original prototype. This was Rod’s generation 1. He has recently finished generation 5 and his group has produced about forty of them for field testing. Each generation has brought new features and improved performance.

The SALS was a real contribution to the Independent Laboratory Access for the Blind (ILAB) project. Rod was also able to develop a talking spectrophotometer. This device quantifies the red, blue and green content of a substance, translates it into a numerical value and utilizes a speech chip to “translate” this into a spoken color.

In addition to these tools, Rod was interested in designing a talking voltmeter. It was near the holiday season and Rod was so determined to develop one, that he took it home one Friday, worked on it all night and through the weekend and was able to have a functional model Monday morning. This voltmeter caught the attention of the National Federation of the Blind and they now have a licensing agreement to produce the device.

Cary Supalo recognizes the contribution that these tools have made in providing blind students the independence to observe, without the aid of sighted students, experiments as they are happening. Cary’s hope is that the ILAB initiative will “help blind students get into STEM (Science, Technology, Engineering, Mathematics) professions.” The SALS is being developed in many high schools in the country and was used this summer in Youth Slam to give 200 blind students the opportunity to participate directly in science activities. This unique collaboration which blossomed at Penn State has allowed the development of many devices, not just for laboratory use, but for the larger blind community.

Entering Rod’s office may seem intimidating as one is surrounded by circuit boards, devices, papers, all of which Rod has perfectly arranged and catalogued in his mind for easy access. He admits that it’s even worse at home and is grateful for a wife who can live with his somewhat cluttered approach to life. Amidst the sea of electronics, a sincere and benevolent desire to contribute has allowed Rod to say: If you have an idea, we can do that.”

JOCELYN EDATHIL
Graduate Student Profile

Woke Up, Got Out of Bed

A typical day at work…rarely is that the case in graduate school. During the academic year, every day varies with regard to class work, teaching, research, and social time. Ten hours of each week are usually devoted to teaching for first year graduate students; by the second semester, research is just beginning to accelerate, requiring countless hours of tweaking instruments and learning the basics. Classes have their place as well, whether it is auditing a course or fulfilling the departmental writing assignments. As for social time, late evenings are the time to relax with friends, play sports, or to simply regroup for the next day. Weekends are spent in the outdoors and going out with friends to listen to local bands at downtown restaurants. If graduate students Josh Melko (Castleman research group) and Patty Nguyen (Allcock research group) had an average day it would look a little something like this.

CLAIRE FLEEGER

Left: Josh explains how the nanosecond laser beam bombards a metal rod to produce clusters that may have new properties and useful characteristics.

Left: Patty disassembles and cleans her reaction apparatus so she can start a new reaction the following day.
Graduate Student Profile

Left: If you forget the keys to your classroom, someone is always there to help.

Patty is getting ready to prepare her students for the day’s laboratory procedure. She says, “Being put in a position of responsibility (being a TA) is new to me.”

Left: Relaxing in the evenings and on the weekends is one way to keep these great minds sharp for their workdays (Don Gunaratne, right).

Right: For Josh, “the biggest surprise [of graduate school] is the social aspect. I guess I always had this notion that all graduate students do is eat, sleep, and do research. Although my workdays are really busy, if you budget your time right, there is time for social activities.”

Above: After a long day of teaching, grading, class work, and research, it is time to head home and get ready for the next busy day.
During the 2006-2007 academic year 35 B. S. degrees were awarded in Chemistry (22 men and 13 women) including four graduates with honors from the Schreyer Honors College and nine who were inducted into Phi Beta Kappa. Three of our graduates are headed for medical school; eight will enter graduate school and twelve have accepted positions with chemical or pharmaceutical companies. The other graduates were waiting to finalize post-Penn State plans.

Isaac Shomer represented Chemistry as the standard bearer at the spring commencement. Isaac graduated with a 3.82 GPA and received a Post-Baccalaureate Fellowship at NIH. Isaac was a mainstay in the undergraduate instrument room and the organic instructional laboratories.

Penn State’s Chemical education interest group was well represented at the 233rd national meeting of the American Chemical Society in Chicago. Katie Masters and Dan Sykes gave three talks on their innovations in laboratory teaching that connects research with the conventional undergraduate laboratory experience. Jackie Bortiatynski spoke on nanoscience topics in K-12 education. Undergraduate students Ryan Smith and Tim Nowack, partially funded by Joseph A. Dixon travel awards, also participated in this meeting.

The enthusiasm generated at the ACS meeting spurred Jackie, Katie and Dan to apply to host the Biennial Conference on Chemical Education in 2012. This conference is the biggest event in chemical education and typically brings together over 1000 educators from around the country. The last time this meeting was held at Penn State was in 1974 when Roy Olofson organized it.

The Chemical Education Colloquium this year was given by Professor Nicholas Turro of Columbia University. Professor Turro is widely known both for his research in organic photochemistry and for his work in chemical education. He gave a talk entitled “Content, Context and Cognition as Three Structural Pillars for Teaching, Learning and Research in Chemistry.” During his visit Professor Turro also served on the panel of experts for the second annual American Wizard Competition. Eight students, supported by seven faculty sponsors, competed for the wizard’s wand. This year the prize went to Sean Conte for Phil Stemple’s “Colorful Electrochemistry” demo.

In spring 2007 the chemistry education interest group hosted an all-campus chemistry faculty meeting that was attended by 36 faculty members from fourteen Penn State campuses. The purpose of the meeting was to share best teaching practices in lower-division chemistry courses and discuss curriculum coordination among the various campuses within the Penn State system. The meeting was deemed highly successful and will become an annual event.

Once again, the annual fall and spring student poster sessions were a huge success. These sessions allow our undergraduates to showcase the independent work that is done in the instructional laboratory courses (Introductory, Organic, Analytical and Physical Chemistry). The spring session involved 52 posters and 147 students from five different chemistry courses. Each poster was reviewed by at least one faculty member not involved with the course and prizes were given for the best posters in several categories.

The Nittany Chemical Society (student affiliate of the ACS) and Alpha Chi Sigma (the chemistry fraternity) had busy years, with many social events and projects in-
Including hands-on experiments for children at THON 2007, the annual Halloween show and helping to organize the American Wizard competition. New officers of the NCS are Tory Miksiewicz, Chandra Richards, Steven Owens, and Jessica Panico who were elected as the new president, vice-president, secretary, and treasurer for the 2007-2008 academic year.

The Department has lost a valuable and highly esteemed colleague. Chris Falzone has decided to move to the Department of Chemistry at the Johns Hopkins University. In addition to his teaching abilities (2006 Priestley Prize winner) Chris was highly regarded for his dedication to student advising and University service in the Faculty Senate. Everyone will miss Chris’ engaging personality, empathy with students and teaching abilities.

Clockwise from top, left: Jackie Bortiatynski with Isaac Shomer, the Chemistry Department’s standard-bearer at the May 2007 commencement ceremony. Above: Chris Falzone, 2006 Priestley Award winner, has moved to the Johns Hopkins University. Left: Faculty members Ken Feldman (center) and Ray Funk (right) discuss data with undergraduate Liz Gratton at the spring poster session.
Doctoral Dissertations and Master’s Theses

Anderson, Mary Elizabeth, “Chemically Advanced Nanolithography” PH D (Supervised by Paul S. Weiss and Mark Horn)

Biddle, Zachary Mikel, “Synthetic Cell Surface Receptors Designed for Internalization of Macromolecules” M S (Supervised by Blake R. Peterson)


Cheng, Juan, “Developing Molecular Depth Profiling and Dynamic Imaging with TOF-SIMS Cluster Ion Beams” PH D (Supervised by Nicholas Winograd)

Dai, Qian, “New Phosphorus Ligands: Development and Applications in Transition Metal Catalysis” PH D (Supervised by Xumu Zhang)

Davis, Kevin Matthew, “An Investigation of the Photoexcitation Dynamics and Stability of Clusters” PH D (Supervised by A. Welford Castleman, Jr.)

Earnheart, Kimberly Cossey, “ Attempted Retrocycloadditions of 3,6-Dihydro(2H)1,3-Oxazines and Diastereoselective Synthesis of 2,3,6-Trisubstituted Tetrahydropyranones Using a Novel Prins Cyclization” M S (Supervised by Raymond L. Funk)


Feltz, Robert Joseph, “Synthetic Ribonucleosides as Antiviral Agents and Improved Nucleoside Glycosylation Methodology” M S (Supervised by Blake R. Peterson)

Fleming, David Andrew, “Functional Nanoparticles: Synthesis and Application” PH D (Supervised by Mary Elizabeth Williams)

Gilmartin, Brian Patrick, “Artificial Metal-Chelating Oligopeptides for Duplex Assembly as Inorganic Analogues of DNA” PH D (Supervised by Mary Elizabeth Williams)

Golightly, Justin Samuel, “Formation and Characterization of Nanoparticles via Laser Ablation in Solution” PH D (Supervised by A. Welford Castleman, Jr.)

Hatcher, Elizabeth Rose, “Proton-Coupled Electron Transfer Reaction in Soybean Lipoxygenase” PH D (Supervised by Sharon Hammes-Schiffer)

Hutchins, Benjamin Mitchell, “Nanoparticles as Tools for Directing and Observing Protein Motors” PH D (Supervised by Mary Elizabeth Williams)

Hydutsky, Bianca Will, “The Design and Transport of Zerovalent Iron Particles for Environmental Remediation” PH D (Supervised by Thomas Mallouk)

Hydutsky, Darren Paul, “Ultrafast Dynamics of Solvation and Isotope Effects in Dissociative Processes” PH D (Supervised by A. Welford Castleman, Jr.)

Iyer, Malliga Ramnarayan, “Studies on the Stability and Reactivity of 2,4-Hexa
dydroxydiphenoyl (HHDP)-Bearing Ellag
tannin Monomeric Unit: Allenyl Azide Cy
cloaddition Chemistry Applied toward the Synthesis of Alkaloids” PH D (Supervised by Ken Feldman)

Jeong, Jeannie Hie, “Studies Directed Towards the Total Synthesis of the Marine Alkaloid Haouamine A” M S (Supervised by Steven M. Weinreb)

Karatjas, Andrew George, “Studies toward the Synthesis of TMC-95A and Development of an Enantioselective Pummerer Reaction for the Synthesis of 3,3-Spirocyclic Oxindoles” PH D (Supervised by Ken Feldman)

Kline, Timothy Ryan, “The Design and Control of Catalytic Motors” PH D (Supervised by Ayusman Sen)

Knappenberger, Jane Anne, “Modulation of Thermodynamic and Kinetic Properties in β Hemoproteins: Characterization of a Family of PsaE-Cytochrome b5 Chimeras and Synechocystis sp. PCC 6803 Hemoglobin” PH D (Supervised by Juliette T. J. Lecomte)

Graduate student Andrew Latham received a fellowship from the ACS Division of Analytical Chemistry.
McElwain, Mandi Jo, “A New Glycosylation Methodology through Alkylidenecarbene Intermediates and Intramolecular Allenyl Azide Cycloaddition Chemistry to Provide Transient Azatrimethylenemethane (ATMM) Intermediates En Route to Nitrogen Containing Tricycles” M S (Supervised by Ken Feldman)

McGuiness, Christine Lara, “Molecular Assembly at Bare Semiconductor Surfaces” PH D (Supervised by David L. Allara)

Nagel, Megan Lee, “Copolymerization of Polar and Nonpolar Vinyl Monomers: Mechanistic Insight and Free Radical Polymerization” PH D (Supervised by Ayusman Sen)

Nanayakkara, Sanjini Ushika, “Precise and Directed Assembly and Chemistry at the Atomic Scale” PH D (Supervised by Paul S. Weiss)

Overberg, Jennifer Julene, “SOL/GEL Glass Coatings for DNA Microarrays” M S (Supervised by Carlo G. Pantano)

Pantzar, Lisa Marie, “Luminescent Artificial Oligopeptides and ZN2+-Linked Duplexes” M S (Supervised by Mary Elizabeth Williams)

Paxton, Walter Fred, “Autonomous Motion of Catalytic Nanomotors” PH D (Supervised by Ayusman Sen)

Plante, Jeffrey Paul, “Self Assembled Tweezer-Type Metalloreceptors for the Recognition of Nucleotides” PH D (Supervised by Timothy Glass and Ken Feldman)

Reilly, Nelly Moore, “Fundamental Study of Noble Metal and Transition Metal Oxide Clusters in the Presence of CO: Insight into Mechanisms of Heterogeneous Catalysis” PH D (Supervised by A. Welford Castleman, Jr.)

Singh, Anurima, “Synthesis and Characterization of Polyphosphazenes for Surface and Biomedical Applications” PH D (Supervised by Harry R. Allcock)

Small, Yolanda A, “Molecular Dynamics Simulations and Quantum Mechanical/Molecular Mechanical Methods for Proton and Hydride Transfer in the Enzyme Dihydroorotate Dehydrogenase” PH D (Supervised by Sharon Hammes-Schiffer)

Smiley, Edward James, “Molecular Dynamics Simulations of Atomic and Cluster Bombarded Surfaces” PH D (Supervised by Nicholas Winograd)

Stoermer, Rebecca Louise, “Barcoded Metal Nanowires for Multiplexed DNA Hybridization Assays” PH D (Supervised by Christine D. Keating)

Stone, David A, “Development of Phosphazenes-Based Materials for Advanced Applications” PH D (Supervised by Harry R. Allcock)

Swalina, Chester W, “Dynamical Electron-Proton Correlation in the Nuclear-Electronic Orbital Framework” PH D (Supervised by Sharon Hammes-Schiffer)

Szakal, Christopher Wayne, “Advancing ToF-SIMS with a Buckminsterfullerene Ion Source” PH D (Supervised by Nicholas Winograd)

Uche, Uzodinma Nnaemeka, “Analysis of Poliovirus-RNA-Dependent RNA Polymerase (3D POL) Catalysed Incorporation of Nucleotide Analogues on Symmetrical Substrates” M S (Supervised by Craig E. Cameron and Juliette T. J. Lecomte)


Wilson, Matthew Clifford, “Investigations in Quantum Monte Carlo” PH D (Supervised by James B. Anderson)

Wittenberg, Nathan James, “Strategies for Elucidating the Biophysical Mechanisms of Exocytosis Using Liposomes and PC12 Cells” PH D (Supervised by Andrew Ewing)


Yan, Yongjun, “Development of Efficient Phosphorus Ligands for Transition Metal Catalyzed Reactions” PH D (Supervised by Xumu Zhang)

Graduate student Kari Stone, recipient of the 2007 Schering-Plough Science and Innovation Award for excellence in analytical chemistry.
Alumni Profiles

Richard Silverman:
Born in Philadelphia, Pennsylvania, Richard Silverman began his time at Penn State in a rather unorthodox manner: having graduated from high school mid-year, he began taking courses at the University Park campus during the spring semester. As was the convention in the mid-sixties, young Silverman’s housing options were quite limited. “[I was] living in old army barracks, which were the freshman dorms at the time,” he recalls. However, despite the meager housing and the criminal lack of football games, Silverman enjoyed the term so much that he decided to remain at Penn State to earn his bachelor’s degree in Chemistry.

After graduating Magna Cum Laude with a B.S. in chemistry, Silverman left Penn State to join the Army for several years, during which time he was awarded the Commendation Medal for meritorious service in 1971. He then went on to earn his Ph.D. in organic chemistry at Harvard University, followed by a postdoctoral position at Brandeis University where he studied specific enzyme inactivation. When he began his independent research as an Assistant Professor at Northwestern University, he was able to combine his experience in organic chemistry and enzymology, thus beginning his work on the “design, synthesis, and investigation of selective enzyme inhibitors.” This research particularly focused on enzymes with applications in the medical field.

To this day, Silverman continues his research at Northwestern, where he is not only the John Evans Professor of Chemistry, but also a Professor of Biochemistry, Molecular Biology, and Cell Biology. His current interests have gone beyond enzyme inhibition and the main research in his laboratories focuses on the design of small molecular therapeutics for neurodegenerative diseases, as well as antimicrobial and antitumor agents. In fact, Silverman developed Lyrica, now distributed by Pfizer, which is utilized in treating both neuropathic pain and epilepsy.

Recent accomplishments in the Silverman labs include the development of several new inactivators and inhibitors of brain aminobutyric acid (GABA) aninotransferase. Typically, this ability manifests itself in compounds that are useful in both the treatment of addiction and as anticonvulsants. Further successes have been made in studies relating to treatment for neurotoxicity and stroke, as well as promising results in the synthesis of an analog to a Chinese herbal medicine (celastrol) which has recently been found to aid in the prevention of neurodegeneration.

Silverman is married and is the proud father of three. He is the author of over 230 scientific publications, the recipient of more than 60 honors and awards for contributions to science and teaching, the owner of 38 patents, and an editor for 6 scientific journals in his field. Further information can be found at his research website http://chemgroups.northwestern.edu/silverman/index.htm and he can be contacted directly at his (very witty) email address, Agman@chem.northwestern.edu.

Chad Mirkin:
Chad Mirkin arrived at Penn State in 1986 after earning his bachelor’s degree in chemistry at Dickinson College. Studying under Professor Gregory L. Geoffroy, he completed his Ph.D. in organic Chemistry in 1989. Mirkin went on to an NSF postdoctoral fellowship at MIT. In 1991 he became a chemistry faculty member at Northwestern University, where he remains to this day. He is currently the Director of the International Institute for Nanotechnology, the George B. Rathmann Professor of Chemistry, Professor of Medicine, and Professor of Materials Science and Engineering.

Some of the more notable research performed in Mirkin’s laboratories has had profound repercussions on the world of nanoscience. Dip-pen nanolithography was developed in his lab (circa 1999) and it continues to be utilized in numerous applications, mostly focusing on the deposition and manipulation of compounds on surfaces with nanoscale precision. Other studies in Mirkin’s group concentrate on the controlled assembly of nanoparticles utilizing the specific binding nature of DNA. This manner of assembly grants researchers the ability to influence the structure and composition of nanoparticles, allowing them to tailor the inherent properties of the nanoparticles for use in numerous applications, including bio-sensing and separation technologies.

Mirkin is the founder of the nanoscience-focused journal, Small, and also is on the editorial board for sixteen other journals. He has authored more than 290 scientific articles and holds 325 patents (60 issued). The research performed in his group has led to the founding of two companies, NanoSphere and Nanolink, both aimed at bringing developing nanoscience technologies into commercial application and production. His accomplishments have been touted by over 50 awards from around the world and he is currently one of the top-ten most cited chemists in the entire field. Further, he was recently named the most-cited nanomedicine researcher in the world.

For more information regarding current research in the Mirkin group, as well as more detail regarding Mirkin’s career, visit their website http://chemgroups.northwestern.edu/mirkingroup/.

 DANIEL BLUMLING
'54 (Ph.D.) Alan Schriesheim has been named a Penn State Distinguished Alumnus. The Board of Trustees presents the Distinguished Alumni Award, Penn State's highest honor, to graduates whose professional achievements, personal qualities, and community involvement exemplify the goals of Penn State. Schriesheim was the director of Argonne National Laboratory from 1983 until 1996. Prior to joining Argonne, he worked for Standard Oil—better known as Esso and then Exxon—for 27 years. He was general manager of Exxon Engineering and director of the Corporate Research Laboratory. During his tenure at Exxon, he won the American Chemical Society's award for research in petroleum chemistry.

'60 (Ph.D.) Stanley R. Sandler, a 52 year emeritus member of ACS, recently revised an article for the Kirk-Othmer Encyclopedia of Chemical Technology, Sulfur Compounds. He is teaching chemistry at Delaware County Community College in Media, PA.

'73 (B.S.) James Fried is Director of Export Sales for Wikoff Color Corporation in Fort Mill, SC. He recently received an Export Achievement Award from the South Carolina/U.S. Department of Commerce for the company's success in developing international market sales in new markets and increasing sales in existing markets.

'78 (Ph.D.) Stephen Di Biase has been selected to receive an Outstanding Science Alumni Award from the Eberly College of Science. Stephen serves as the Senior Vice President and Chief Scientific Officer for the Research Development and Engineering Department at JohnsonDiversey. This role is responsible for research and development efforts yielding business growth through technology and innovation. Before joining JohnsonDiversey, he spent 26 years with the Lubrizol Corporation, where he held a variety of leadership positions, including general management roles.

'81 (B.S.) Nicholas Basta has been promoted to Professor of Soil and Environmental Chemistry in the School of Environment and Natural Resources at the Ohio State University.

'82 (Ph.D.) Henry C. “Hank” Foley has been appointed Dean of the College of Information Sciences and Technology (IST) of the Pennsylvania State University. In his role as dean, Foley will be responsible for providing leadership in undergraduate and graduate education, research, and solutions services to a wide array of IT organizations. The dean also plays an important role in coordinating the educational programming for IST across all undergraduate campuses of the University.

'82 (Ph.D.) Angelos Scopelianos has been named an Outstanding Science Alumnus by the Eberly College of Science. Angelos is the Vice President, R&D for the “Center for Biomaterials & Advanced Technologies” (CBAT) at Johnson & Johnson. CBAT is an applied research and early product development organization whose mission is to provide the various J&J companies with new proprietary biomaterials, as well as cell based and controlled release technologies leading to novel and proprietary products.

'82 (Ph.D.) Gail Folena-Wasserman was given the lifelong title of Alumni Fellow, the highest award given by the Penn State Alumni Association. Gail is currently senior vice president of development at MedImmune, Inc. Her responsibilities include oversight of analytical development, and cell culture and purification process development for biologicals. She also oversees clinical manufacturing and quality control for investigational products, technology transfer to commercial operations and product life cycle support.

'84 (Ph.D.) Carl Michael Dicken retired as VP for pharmaceutical development after twenty years of service with Elan Pharmaceuticals. He is now teaching high school chemistry and coaching boys’ soccer at Westminster Academy in Fort Lauderdale, FL. Carl’s wife Debbie (’83, M.A. Applied Math) works in the finance office of Target. Son Scott is an undergraduate student in education at Penn State.

'99 (Ph.D.) Jim Kushmerick, now at NIST, was awarded the 2006-2007 NIST Chapter of Sigma Xi Young Scientist Award for Excellence in Scientific Research.

Our Emeritus Faculty members were honored at a November 2006 reception. Front row, left to right: John Lowe, Herman Richey, Tom Wartik, Joe Dixon; Back row, left to right: Bob Minard, Gordon Hamilton, Peter Jurs, Roy Olofson, Bob Bernheim.
'01 (B.S.) Julianne Wolfe (Ware) for the past two years has been working for the Medical Examiner of Allegheny County as a forensic toxicologist. In April 2006 she and her husband welcomed a son, Caleb Michael, into their lives.

'02 (Ph.D.) Yaroslava Yingling joined the Materials Science and Engineering Department at North Carolina State University in Summer 2007 as an Assistant Professor.

'04 (Ph.D.) David Proctor accepted a postdoctoral fellowship in Professor David Lilley’s laboratory at Dundee University in Scotland.

'06 (Ph.D.) Rieko Yajima is a Senior Program Associate in the Research Competitiveness Program of the American Association for the Advancement of Science.

'06 (Ph.D.) Sanjini Nanayakkara is a postdoc with Prof. Dawn Bonnell at the University of Pennsylvania. Sanjini had a baby daughter, Ashlee.

First year chemistry graduate students, September 2007.

In Memoriam

'54 (B.S.) John E. (Jack) Hampford, age 75 of Trumbull, died Friday, March 23, 2007 at Cambridge Manor, Fairfield. He was the beloved husband of the late Clare (Tee) Malarky Hampford. Born in Pottsville, Pa., he was a graduate of Pottsville High School, Class of 1950 and a two time state champion gymnast. He graduated from Penn State University, Class of 1954 with a Bachelor of Science Degree in Chemistry. He also competed in gymnastics at Penn State and in the 1952 Olympic Trials. He has been a Trumbull resident for 39 years. Mr. Hampford was founder and chairman of Hampford Research, Inc. in Stratford, a 25-year-old manufacturer of specialty chemicals. He was a member of SOCMA (Synthetic Organic Chemical Manufacturers Association), and past president of the Connecticut Rubber Group. He was honored as a dedicated Alumni Fellow of Penn State University and a Golden Tee recipient at the Cardinal Shehan Center, Bridgeport where he was a former Board Member. He was a member of the Founder’s Club at Manhattanville College and a longtime supporter of the Mercy Learning Center of Bridgeport. He was a member of Brooklawn Country Club for 30 years and an avid golfer who traveled the world to play. He was also a collector of vintage automobiles. Survivors include his loving children, Kate Hampford Donahue and her husband, Joe, of Trumbull, John E. Hampford Jr. of Milford, Anne Hampford of Easton, Martin Hampford of Shelton and Tim Hampford and his wife, Lori Carroll, of Trumbull; sister, Barbara Devlin of Schuylkill Haven, Pa.; nine grandchildren, Katy, Grace, and Jimmy Donahue, Johnny and Will Hampford, Amelia, Clare, Maeve, and Norah Hampford; and many nieces and nephews. In addition to his wife, his brother, James Hampford, predeceased him. Published in the Connecticut Post from 3/24/2007 - 3/25/2007.

'48 (M.S.) '51 (Ph.D.) Henry C. Tillson, 83, retired from Hercules Inc., died on October 25, 2006. He received his S.B. in Chemistry from MIT in 1944. He was living in Freehold, N.J. at the time of his death. His survivors include his wife, Helen Hannan Tillson, two daughters and six grandchildren.

Antoinette M. (Toni) Shapiro, 91, died on March 7, 2007, at her Harvest Hill home in Lebanon, Pennsylvania. Toni and husband Ed established the Shapiro Professorship in Chemistry.

Karen Sue Heichel, 47, Staff Assistant in the undergraduate programs office, died on September 13, 2007. Karen Sue, who joined the Department in 2001, was primarily responsible for providing administrative support to the laboratory instructional courses. She enjoyed painting, gardening and all activities with her grandson. Karen Sue was working on a Bachelor degree in Fine Arts at Penn State. She will be missed by all of her friends and colleagues.
The individuals and companies listed on this page have generously supported the Department of Chemistry either by donating directly to the Department or to an individual faculty member’s research.

**Individual**

Harry R. and Noreen E. Alcock  
Steven H. Anderson  
Becky W. Andrews  
Tamie D. Baggett  
William C. and Christie Heritage Baird  
Rouvain M. and Edna Bension  
James L. and Alexandra Broyles  
Mark S. and Deborah A. Connolly  
John and Nancy Deane  
Ronald E. and Patricia A. Distefano  
Angelo and Theresa D’Orazio  
William J. and Carol L. Drawe  
Donald W. and Evelyn Graulich Emerich  
Stephen H. and Joan S. Feairheller  
David A. and Thuy Huong Flosser  
Nancy Frees Fountain  
Sarah-Jane V. Frankland  
Marian Coppersmith Fredman  
Samuel G. Fredman  
Alan J. and Suzanne Stano Freyer  
Peter F. and Julia A. Gavin  
John and Caro Ann Germann  
Stephen J. Germusa  
Wayne L. and Elizabeth J. Gladfelter  
Jonathan Gold  
Edward J. and Jacquelyn Goldstein  
Abner D. and Roslyn Goldstein  
George W. Goodloe  
Robert H. Graham  
Wassyl and Susan R. Halzencenko  
John E. Hampford  
William and Mary Everitt Hanagan  
Nicholas T. Hartman  
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Charles D. and Virginia S. Jones  
James F. and Ellen S. Kahn  
Joseph T. and Suzanne Keiser  
Eric H. and Tara Keiter  
Jeffery L. and Cynthia M. King  
Andrew R. Kleinberg  
Jacob J. and Deborah P. Kleinschuster  
Mary Lou Kohout  
Victor C. Ku  
Barry K. and Jan A. Lavine  
Michael L. Levin  
Richard and Patricia Neidig Lewis  
Mildred M. Maguire  
Geoffrey P. and Debbie Malafsky  
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Dean F. and Barbara B. Martin  
Robert S. and Linda K. Metzger  
Joseph A. Miller and Rachel Wood  
Charles P. and Dorothy A. Neidig  
William N. and Christy Neidig  
William R. and Connie L. Nicholson  
Roy A. Olafson  
William A. Pavelich  
Thomas A. Pavlosky  
Kirk P. and Carolyn Pendleton  
Ruth S. Pioch  
Jeffrey S. and Elizabeth C. Ross  
Paul A. and Debra O. Sabatino  
Bill and Vianne M. Sakoda  
William A. and Joan Legg Schreyer  
Frances Thompson Sellers  
Erin D. Sheets  
Anthony J. and Heand Johns Silvestri  
Kathleen E. Simmons  
Susan E. Strong and John R. Stillian  
H. Campbell Stuckeman  
Danny G. Sykes  
Matthew E. Szapacs  
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Dear Alumni and Friends,

The chances are great that this is not the first article you look for when opening the Chemistry Newsletter. I suspect then that you have already read about the many wonderful events that have been happening in Penn State Chemistry. It is important to note, however, that we could not have gotten here without a little help from our friends.

By almost any measure our Department continues to be one of the most prestigious chemistry programs in the world. Our faculty members are conducting innovative, creative research in many areas critical to society. Look for example at the work being done in the development of new materials. Other researchers are working on some of the fundamental mechanisms underlying basic cellular processes. Based upon the external research funds generated, prestigious prizes received and publications in respected journals, our Department’s faculty members are clearly at the top.

The same can be said of our students and staff members. The articles in this issue of the Newsletter highlight some of the prizes and awards received over the past year. Our graduates continue to move into positions with some of the best universities and corporations in the country. Our staff members provide critical administrative, scientific and technical support for research and teaching. In this issue of the Newsletter there is an article describing the imaginative collaboration between Chemistry’s Research Instruments Facility and the National Federation of the Blind.

I must also mention the innovative and dedicated members of our instructional program. The faculty members who presented papers at the chemical education (CHED) section of the Chicago ACS meeting received tremendous positive feedback from their colleagues. Many in the chemical education community are surprised that a large research department such as ours offers an innovative, student-centered program in undergraduate education.

In May 2007 we installed three paintings in the atrium of the Chemistry Building. The three canvases that comprise this piece, Song Cycle, are beautiful. You can read more about the artist and his vision for the work in the article by Elisabeth Vose. These paintings are a major addition to the building and campus. In fact, this is a unique achievement within the Penn State University system.

To me, what makes this installation especially pleasing is that it was made possible by donations from alumni and friends of the Department. During the planning stage an account was created to accept donations that were to be used to enhance the building, making it more inviting to visitors and those who work here. I think that Song Cycle certainly fulfills the objective of the enhancement fund. I urge all of our friends and alumni to make a point of visiting the Chemistry Building and viewing the new acquisition.

If you do have a chance to visit the campus I also urge you to take time to meet some of our students. Many of our alumni have taken an undergraduate course that is designed to help our majors choose a career path. The course, The Professional Chemist, engages the students with chemistry majors who have gone on to careers in academia, industry, professional school (law, medicine, dentistry) and other jobs that one might not associate with a major in chemistry. I invite you to contact me (jbroyles@chem.psu.edu) if you are interested in talking to the students, either in a classroom setting or an informal venue such as lunch or coffee.

In his article, Ayusman Sen talks about how successful the Department has been this year in recruiting new faculty members. The recruitment and retention of top faculty members are vital components behind our efforts to enlarge our current, successful research programs in materials, energy, and environmental chemistry.

We are also always looking for outstanding students for our graduate program. How can you help? Penn State alumni send many of our best students to us. If you are in academics or work with student interns in an industrial laboratory, please let them know about the exciting research program at University Park.

We also welcome your support in the form of a gift to either a directed fund or a general gift to the Department. Our College’s Development Office is very good about matching potential donors with programs that connect to their interests and passions. In addition to supporting research and graduate education, donor gifts are important to our undergraduate program. If you wish to direct a gift to the Department of Chemistry please contact the Development Office at (814) 863-8454.

On behalf of Penn State Chemistry I would like to thank our many individual and corporate donors. Without your support and encouragement we would not have been able to realize the wonderful accomplishments that you have read about in this issue of the Newsletter.
Upcoming Events
Here are some events where you will have the opportunity to meet fellow alumni, faculty and staff. Please join us.

MARKER LECTURES
Laura Kiessling, Univ. of Wisconsin

ROHM & HAAS LECTURE
Tim Swager, MIT
October 18, 2007
University Park

ACS NATIONAL MEETING
April 6-10, 2008
New Orleans, LA

CCR ANNUAL MEETING
April 27-29, 2008
St. Louis, MO

ACS NATIONAL MEETING
August 17-21, 2008
Philadelphia, PA