New Grant for Catalysis Research at the NSLS

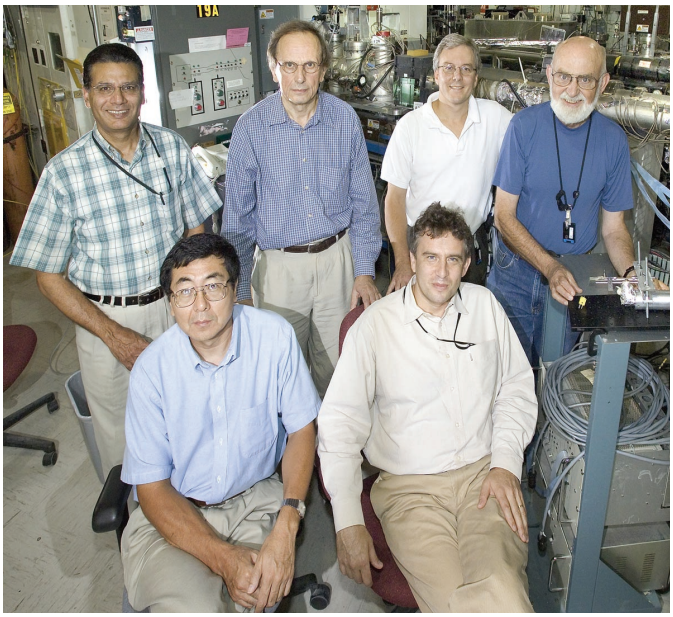
September 28, 2005

A group of scientists was awarded a $900,000 grant by the Department of Energy to create dedicated facilities for catalysis research at NSLS beamlines X18B and X19A. The two facilities will be operated by the Synchrotron Catalysis Consortium, charged with improving and expanding catalysis research by taking advantage of the unique investigation tools available at the NSLS.

Catalysis is a major area of research in the United States because it is very important to U.S. industry, particularly the chemical and petroleum industries. It is estimated to be involved in 90% of all chemical processes and the creation of 60% of the chemical products available on the market. In addition, catalysis is becoming more important to several other fields, including environmental protection, pharmaceuticals and bioengineering, and the development of fuel cells.

The consortium's main investigation tool will be x-ray absorption fine-structure (XAFS) spectroscopy, which measures how a material absorbs x-rays to learn about its molecular structure and electronic behavior.

"XAFS is well suited to studying catalysis, and can often yield more in-depth information on a material's structural, electronic, and catalytic properties than more widely used techniques," said Anatoly Frenkel of Yeshiva University, one of the consortium's principal investigators. "We hope to help make more scientists aware of the advantages of using synchrotron radiation in general, and XAFS in particular, and provide support for scientists who wish to start catalysis experiments at the NSLS."



Some of the key members of the Synchrotron Catalysis Consortium. In the front row, from left, are principal investigators Jingguang Chen and Anatoly Frenkel. In the back, from left, is NSLS scientist Syed Khalid, who runs beamline X18B, and co-principal investigators Radoslav Adzic, Steve Hulbert, and Jonathan Hanson.

The two other principal investigators are Jingguang Chen of the University of Delaware and Radoslav Adzic of Brookhaven's Chemistry Department. Chen said, "Synchrotron techniques are currently underutilized or unexplored by the catalysis community due to various perceived and real barriers. The primary purpose of the consortium is to promote the utilization of synchrotron techniques to perform cutting-edge catalytic research under *in-situ* conditions."

Said Adzic, "This consortium is expected to have a particularly strong impact on the research and development of fuel cell electrocatalysts. Capabilities for *in situ* characterization of electrocatalysts in fuel cell environment under various conditions will be provided by adequate cell designs."

The consortium's co-principal investigators are Chi-Chang Kao and Steve Hulbert (NSLS), Jan Hrbek, Jose Rodriguez and Jonathan Hanson (BNL-Chemistry), David Mullins and Steve Overbury (Oak Ridge National Laboratory), and Simon Bare (UOP, LLC).

The grant will fund new hardware additions and changes at X18B and X19A, allowing scientists to study chemical transformations in catalytic materials over a wide range of energies in real time and at realistic operation conditions. Examples of new devices that will benefit the catalysis-research community are state-of-the-art reactor cells, gas-handling equipment, and detectors. The upgrades will also include the latest advances in beamline instrumentation. All these changes will provide new experimental opportunities for scientists interested in catalysis.

In addition, the grant includes funds to hire a beamline staff to run the new facility and provide support for visiting research groups. The budget also includes funds for travel, which will help new user scientists start synchrotron research programs as well as attend catalysis workshops and training courses.

Most components at X18B and X19A will be in place by April 2006. Catalysis users are now being contacted with invitations to start their research program at the NSLS, and the first users will start experiments in February 2006. The grant covers a time span of three years.

— Laura Mgrdichian

EXAFS Course: Theory, Experiment, and Advanced Applications

September 28-30, 2005

X-ray absorption fine structure (XAFS) data collection and analysis courses have been held at the NSLS annually since 2001. While previous courses were aimed at beginners and thus broad in scope, this three-day (September 28-30) course was devoted to one technique: extended XAFS (EXAFS).

Partcipants in the EXAFS course

Participants in this course (32 scientists from U.S. and Canada, representing universities, national laboratories, and industrial companies) had prior familiarity with the basics of the technique and were interested in learning how to correctly design, perform, and analyze EXAFS experiments in application to their research. The course was self-contained, starting with the fundamentals and proceeding to the more advanced topics, including recent theoretical developments, data analysis techniques, and specific applications of EXAFS.

The course consisted of three lecture sessions in the mornings, two hands-on experimental sessions in the afternoons, and one data analysis session during the last day of the course. The organizers identified four areas of interest: nanocatalysis, environmental/bio/geo chemistry, disordered alloys/thin films, and transition metal oxides, and designed several research experiments in each of these areas. Experiments were conducted at eight beamlines.

Lectures were taught by invited speakers: Edward Stern and Josh Kas (University of Washington), Grant Bunker (Illinois Institute of Technology), Anatoly Frenkel (Yeshiva University), Trevor Tyson (New Jersey Institute of Technology), Joseph Woicik (National Institute of Standards and Technology), Douglas Hunter (Savannah River National Laboratory), Scott Calvin (Sarah Lawrence College), and Douglas Pease (University of Connecticut). Among the highlights of the course were two talks, “History of EXAFS” and the “Pitfalls of the Experiment and Data Analysis,” which was taught by Edward Stern, one of the founders of the technique.

Beamline instructors were F. Alamgir (City University of New York), T. Tyson, A. Frenkel, J. Woicik, A. Ignatov (Case Western Reserve University), K. Pandya (Brookhaven National Laboratory), P. Northrup (Brookhaven National Laboratory), W. Caliebe (Brookhaven National Laboratory), S. Khalid (Brookhaven National Laboratory). Data analysis session were led by S. Calvin, A. Frenkel, F. Alamgir, T. Tyson, J. Woicik, S. Khalid and P. Northrup.

The course administrator was Corinne Messana (BNL). The course was possible due to generous sponsorship by the National Synchrotron Light Source, Yeshiva University, and the DOE Synchrotron Catalysis Consortium.

— Anatoly Frenkel

Brookhaven Lab Breaks Ground for New Nanocenter

October 3, 2005

The U.S. Department of Energy’s (DOE) Brookhaven National Laboratory held a groundbreaking ceremony on October 3 for the Center for Functional Nanomaterials (CFN). The CFN will provide researchers with advanced probes and the ability to use new fabrication techniques to study materials at nanoscale dimensions — typically, billionths of a meter, or 1,000 times smaller than a human hair. These materials have different chemical and physical properties than bulk materials and could form the basis of new technologies.

The CFN — one of five Nanoscale Science Research Centers to be built at DOE national laboratories — was designed by HDR Architecture, Inc., of Alexandria, Virginia, and is being constructed by E. W. Howell Co., Inc., of Woodbury, New York. The 94,500-square-foot state-of-the-art laboratory/office facility is expected to attract an estimated 300 researchers from the Northeast annually.

(L to R) Laboratory Director Praveen Chaudhari, DOE Brookhaven Site Office Manager Michael Holland, Battelle Memorial Institute Senior Vice President and Chief Operating Officer Donald McConnell, Associate Director for the DOE Office of Basic Energy Sciences Patricia Dehmer, Congressman Timothy Bishop, CFN Director Robert Hwang, and Associate Lab Director for Basic Energy Sciences Doon Gibbs.

Brookhaven employees and distinguished guests, including local Congressman Tim Bishop and Dr. Patricia Dehmer, Associate Director for the U.S. Department of Energy’s Office of Basic Energy Sciences, attended the ceremony against a backdrop of heavy equipment at the CFN location in the center of Brookhaven’s 5,300-acre site.

“The Center for Functional Nanomaterials will be at the forefront of research that is expected to lead to new technologies, such as faster computers, new communications devices, improved solar energy and new energy alternatives,” Congressman Bishop said. “Long Island is fortunate to have this center here. Everyone reaps benefits when the best minds and the best technology merge to explore the frontiers of science.”

DOE’s Office of Basic Energy Sciences is funding the $81-

million CFN project. The contemporary building, which has a metal and glass exterior, will cost $38 million to build, while specialized equipment, such as electron microscopy facilities and lithography-based fabrication facilities, and engineering and project management will account for the balance of the budget. The facility, which will occupy nine square acres and will accommodate 150 people, will be considered "green," or energy efficient and environmentally friendly, based on the U.S. Green Building Council's rating system. Construction is expected to be completed by March 2007, and experiments are due to begin shortly after that date.

The overarching research goal of the CFN is to help solve energy problems in the U.S. by exploring materials that use energy more efficiently and by researching practical alternatives to fossil fuels, such as hydrogen-based energy sources and improved, economical solar energy systems.

Under the energy banner, CFN studies will focus on three key areas: nanocatalysis, the acceleration of chemical reactions using nanostructures; biological and soft nanomaterials, such as polymers and liquid crystals, in which specialized design is expected to lead to new functions; and electronic nanomaterials that exhibit unprecedented control of electrons, which are expected to lead to new communication and energy-control devices.

— Diane Greenberg

NSLS Users Recognized

October 21, 2005

Each year, a number of NSLS users win prestigious awards in their field of scientific research. The following represent a collection of some of the awards from 2005.

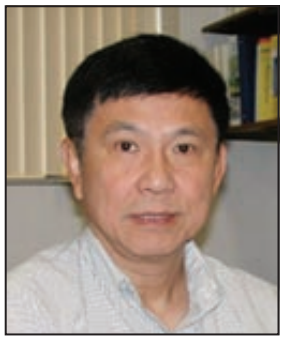
Russell Hemley and David Mao Win the Balzan Prize

Russell Hemley

This year, the International Balzan Foundation Prize for Mineral Physics was awarded to Russell Hemley and Ho-Kwang (David) Mao, both scientists with the Geophysical Laboratory at the Carnegie Institute of Washington.

Hemley and Mao received the award "for the impressive impact of their joint work leading to fundamental breakthroughs, theoretical and experimental, in the field of minerals submitted to extreme physical conditions." Much of their work — particularly their early, pioneering studies — has been, and is currently, performed at the NSLS.

They began working at the NSLS in 1986, using beamline X13A (later renamed X7A) to perform x-ray diffraction studies of materials subjected to extremely high pressures. Later, they helped build X17C — the world's first dedicated high-pressure beamline — and also conducted high-pressure infrared spectroscopy studies at U4IR, U2B, and U2A (the world's only dedicated beamline for that type of research).

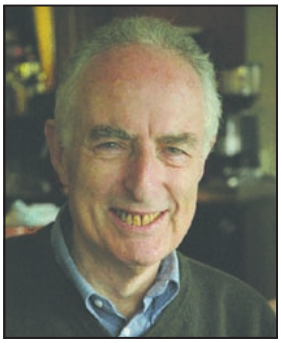


David Mao

"They have operated as a highly effective team," remarked the award committee, "characterized by twenty years of research contributions at the highest level. They have developed techniques which allow them to study the behavior of a wide range of minerals, such as hydrogen, the most abundant 'mineral' in the universe. Their results have deep implications for our understanding of nature."

The prize will be given out on November 11 in Berne, Switzerland at the Swiss Federal Parliament Buildings. Each prize consists of one million Swiss francs (about $773,000), half of which must be used to fund research projects by students and young scientists at the winners' home institution.

Philip Coppens Receives the Ewald Prize



Philip Coppens

Longtime NSLS user scientist Philip Coppens, a Distinguished Professor and Henry M. Woodburn Chair of Chemistry at the State University of New York at Buffalo, was awarded the prestigious Ewald Prize by the International Union of Crystallography (IUCr).

The prize honors Coppens' contributions to developing the fields of electron density determination and the crystallography of molecular excited states. He was also recognized for his commitment to the education of future crystallographers through many courses and workshops.

A significant part of the work for which he received the award is the result of studies at former NSLS beamline X3, which was operated by a collaboration of several SUNY campuses and for which Coppens was principal investigator for many years.

At X3, Coppens developed many of the methods he now uses in his research. Early on, he and his group performed several studies to determine the charge densities in various materials using x-ray diffraction. These experiments provided valuable insight into the properties of crystalline materials and the nature of chemical bonds within molecules and interactions between molecules. In later research, the group performed their first time-resolved studies at X3, using x-rays to determine the nature of molecular excited states that exist for very short

periods but are highly reactive. The first results of this research were published in 2002.

Coppens formally received the Prize during the IUCr's Florence Congress Opening Ceremony on August 23. The Prize, presented just once every three years at the triennial International Congresses of Crystallography, consists of a medal, certificate, and $30,000.

2005 Chief's Honor Award for Distinguished Science Goes to Barbara Illman

Barbara Illman

Research plant pathologist and NSLS user Barbara L. Illman, who is Director of the Institute for Microbial and Biochemical Technology at the Forest Products Lab in Madison, Wisconsin, received the USDA Forest Service's 2005 Chief's Honor Award for Distinguished Science for her studies in four major areas of research.

The award recognizes Illman for her efforts in "applying solid-state physics techniques to forestry problems, invasive species mitigation research, bioremediation research, and contributions to long-term ecological research programs."

At the NSLS, Illman developed techniques for using x-rays to study wood decay, recycling of wood biomass material, and bioremediation of toxic chemicals in the environment. This work led to discoveries about the biochemical mechanisms of brown-rot fungi, the most destructive wood-decay organisms. Nearly 10 percent of the 300 million tons of trees harvested annually in the United States are used to replace wood products damaged by the decay fungi. The discoveries could lead to improved methods for protecting wood from fungi.

Illman's many other achievements include measures to control the spread of highly destructive non-native insects, especially in shipping materials. Roughly half of all international trade goods move in wood crates or on wood pallets or spools, or involve other wood material, creating a major pathway for the spread of invasive insects.

The award was presented to Illman in a Washington, D.C. ceremony by Dale Bosworth, chief of the Forest Service.

Noel Clark: Co-Winner of the APS Oliver E. Buckley Prize

The 2006 American Physical Society Oliver E. Buckley Prize, recognizing "outstanding theoretical or experimental contributions to condensed matter physics," was awarded to Noel Clark, physicist at the University of Colorado and a user at beamline X10. He shares the prize with Robert Meyer of Brandeis University.

The two scientists received the award "for groundbreaking experimental and theoretical contributions to the fundamental science and applications of liquid crystals, particularly their ferroelectric and chiral properties."

Clark and Meyer have made very significant contributions to developing the concepts that underlie the fields of liquid-crystal science and technology. Beyond that, they have designed novel, highly creative experiments that verify these concepts. Their efforts also extend to studies of other complex fluid systems, such as liquid-crystal polymers, colloids, and protein solutions.

Individually, Clark has performed a great deal of significant research. One example is his groundbreaking studies of ferroelectric liquid-crystal display cells that made it possible for display-cell manufacturers to use them in commercial devices. And recently, using freeze-fracture electron microscopy and x-ray diffraction, he studied the liquid crystal phases exhibited by banana-shaped molecules and determined their complex structure, which had perplexed the liquid-crystal research community.

Noel Clark

The Buckley prize was formally awarded to Clark and Meyer on March 16 during the March 2006 APS meeting in Baltimore, Maryland. It consists of $10,000 and a certificate.

— Laura Mgrdichian

Highlights from the COMPRES Sponsored Workshop on Synchrotron Infrared Spectroscopy for High Pressure Geoscience and Planetary Science

November 3-5, 2005

In recent years, infrared (IR) microscopy and spectroscopy have greatly benefited from new synchrotron techniques. New infrared synchrotron radiation sources provide a tremendous improvement in flux on a sample, with well-collimated beams from far- to near-IR that give high spatial resolution with unmatched signal-to-noise. This has opened up new scientific directions in a range of fields, including physics, biology, chemistry, materials science, high-technology, and forensics. One of the most exciting areas, however, is high-pressure geoscience and planetary science. High-pressure synchrotron IR spectromicroscopy is an ideal coupling of the diamond anvil cell device and synchrotron IR radiation. In addition, the technique serves as a useful, if not unique, tool to study minerals quenched from high pressures and temperatures, and natural samples (including natural high-pressure assemblages) at ambient conditions.

Sponsored by COMPRES (the Consortium for Materials Properties Research in Earth Sciences) and the NSLS, the work-

Synchrotron Infrared Spectroscopy for High Pressure Geoscience and Planetary Science workshop participants

shop on Synchrotron Infrared Spectroscopy for High Pressure Geoscience and Planetary Science was held at the NSLS in November. The conveners were Zhenxian Liu and Russell J. Hemley (Geophysical Laboratory, Carnegie Institution of Washington). Thanks to the members of the COMPRES Executive Committee and the NSLS staff for suggesting, promoting, and supporting this IR workshop. It was a great success in terms of the excellence of the lectures, its broad attendance that included many new potential users and student participation, its extensive program, and plenty of hands-on experience for new users. More than 50 attendees took part (this was the maximum allowed by the budget and the size of the lecture room).

The workshop consisted of five sessions designed to accommodate the broad spectrum of attendees, ranging from experts to new users. The Friday morning session was directed toward attendees who were new to the modern IR spectroscopy techniques used in this field, but, for experienced users, it was also a very useful review of the fundamentals and new developments. Q. Williams (University of California at Santa Cruz) gave a thorough overview on IR spectroscopy (and FT techniques in general) and its applications in the Earth sciences. G. Rossman (California Institute of Technology) gave a talk on hydrous components in nominally anhydrous minerals, which was crucially important for users who are interested in the calibration of the water content in minerals. A. Hofmeister (Washington University in St. Louis) discussed the high-pressure far-IR spectroscopy of mantle candidate minerals that are worth pursuing with the synchrotron technique. Finally, J. Tse (University of Saskatchewan, Canada) described theoretical methods for vibrational spectroscopy and many other applications.

The Friday afternoon session was started by L. Carr (NSLS). He gave a very comprehensive talk on Fourier transform spectroscopy techniques using the synchrotron infrared source as well as an overview of the IR programs at the NSLS. There were seven additional speakers (A. Goncharov, V. Struzhkin, and S. Jacobsen, Geophysical Laboratory; D. Klug, Canadian Research Council; H. Scott, Indiana University at South Bend; G. Lager, University of Louisville; and Y. Lee, Brookhaven National Laboratory) who discussed different topics related to the work they have done at NSLS beamline U2A. These talks not only addressed a broad range of problems in the Earth and planetary sciences but also reflected new techniques developed at U2A in past years.

The third session, held Saturday morning, focused on imaging techniques combined with synchrotron sources. L. Miller (NSLS) gave an extensive overview of chemical imaging at high spatial resolution using a synchrotron infrared microscope. Other speakers (L. Wang, Stony Brook University; L. Dobrzhinetskaya, University of California at Riverside; M. Koch-Müller, GeoForschungsZentrum Potsdam, Germany; and S. Clark, Advanced Light Source) gave talks featuring the applications of imaging techniques as well as high-pressure IR studies at other synchrotron sources. The facility tour and hands-on session on Saturday afternoon attracted more than 30 people. At the IR beamline, new users received detailed information on the beamline facility and its capabilities, as well as first-hand experience on how to perform high-pressure IR experiments from beginning to end.

The last session, for student/post-doc experiments at U2A, started right after the workshop. Two students and one post-doc submitted their research proposals and one day of beamtime was allocated per proposal. This new session offered not only a great opportunity to learn how to use the synchrotron IR facility but also a chance to collect valuable data for their research projects. The experiments went very well and the IR data they obtained were very interesting and publishable in scientific journals.

— Zhenxian Liu

The NSLS Remembers Bill Oosterhuis

November 16, 2005

Bill Oosterhuis, Team Leader for Condensed Matter Physics and Materials Chemistry in the U.S. Department of Energy's Office of Basic Energy Sciences, passed away on November 16.

Bill was a true friend of synchrotron radiation science. While at DOE, a position he had held since 1991, he made significant contributions to the field, spearheading several major changes to the Condensed Matter Physics and Materials Chemistry team. These include the creation of the X-ray and Neutron Scattering program, the Theoretical and Computational Materials Physics program, and the Experimental Program to Stimulate Competitive Research.

Bill Oosterhuis

Before joining the DOE, Oosterhuis he worked for 17 years at the National Science Foundation, where he was a section head for its

Division of Materials Research. During this time, he became a driving force for progress during the U.S. transition from first-generation to second-generation synchrotrons.

Similarly, while at DOE, he provided support and guidance as third-generation synchrotrons were developed. As a result of his presence during these years, he is widely credited for playing a major role in the growth of synchrotron radiation research. Upon his death, he leaves behind this important legacy.

Bill is remembered for his overall passion for science, and materials research in particular, his finely honed sense of progress and forward-thinking, and, more personally, his pervasive optimism and ability to earn the trust of others. He will be missed by many.

— Laura Mgrdichian

BNL Establishes NSLS-II Project In Light Sources Directorate

December 9, 2005

Steve Dierker

In the fall of 2005, Laboratory Director Praveen Chaudhari named Steve Dierker, Associate Laboratory Director (ALD) for Light Sources, as Project Director of the newly established National Synchrotron Light Source II (NSLS-II) Project. The move was triggered by the Lab's recent success in getting DOE approval for "Critical Decision Zero" (CD-0, Approval of Mission Need) for NSLS-II, the planned world-leading successor to BNL's NSLS. NSLS-II will meet critical scientific challenges of the future, provide state-of-the-art technology for research — complementing BNL's Center for Functional Nanomaterials — and play a pivotal role in fostering economic growth in the northeastern United States.

CD-0 is the first of five Critical Decisions that the project will need to achieve in order to progress through the successively more detailed stages of conceptual design, preliminary design, and final design, followed by construction, and then operations. While the site for NSLS-II is not formally selected until the next Critical Decision (CD-1, Approved Alternative Selection and Cost Range), BNL believes that there are strong reasons for citing NSLS-II at BNL.

"At Brookhaven, we have long experience and deep technical knowledge in the synchrotron light source field, along with an excellent infrastructure, demonstrated support from potential facility users of national and international standing, and an extraordinarily skilled and experienced workforce," states Dierker. "For these and other reasons, we believe NSLS-II should be located here at BNL."

NSLS-II will be a major project, with an estimated cost of $800M, and will employ up to 200 people during the peak of construction. The NSLS-II Project organization is being created in the Light Sources Directorate to put in place the management systems and infrastructure required to execute this complex undertaking. Building upon the groundwork laid by NSLS staff, the first task of the new organization will be to develop the documents required for CD-1, including a Conceptual Design Report and more refined cost and schedule estimates.

As NSLS-II Project Director, Dierker will retain his position as ALD for Light Sources and step down as Chair of the NSLS Department. Chi-Chang Kao, the current NSLS Department Deputy Chair, was named Interim NSLS Chair and assumed his new responsibilities in mid-January, 2006.

The NSLS-II Project Office is housed in Building 817. The organization plan is well under way, and includes an Administration & Finance Office, headed by an Associate Director for Administration & Finance; and three technical Divisions — Accelerator Systems, Experimental Facilities, and Conventional Facilities — each headed by a Division Director. Several advisory committees are being formed to provide broad perspective and expert advice, including an NSLS-II Advisory Board and advisory committees for each of the three Divisions.

Each Division will be responsible for design and construction activities within its specialty area, and will be staffed with a range of specialty groups. Many of these positions are expected to be filled by existing Lab personnel. With an estimated annual operating cost of $90M, the staff required to operate NSLS-II will be about twice as large as that required to operate the present NSLS, adding about 200 new positions to the Laboratory.

— Liz Seubert

2005 NSLS Tours

1/11/2005	Infotonics Technology Center and Javelin Assoc., Rochester Federal Subcontracting Initiative
1/24/2005	City College of New York
1/28/2005	Islip School District Science Faculty
2/17/2005	Rochester Institute of Technology
2/24/2005	United States Department of the Navy
2/25/2005	Hofstra University, Society of Physics Students
3/18/2005	BNL Employee Tour
3/28/2005	City College of New York
4/4/2005	Stony Brook University Undergraduates
4/6/2005	League of Women Voters - Suffolk County Brookhaven Chapter
4/7/2005	University of Connecticut
4/14/2005	Charterhouse School
4/15/2005	Congressman David Hobson
4/21/2005	Queens College
4/28/2005	DOE Facility Managers Conference
4/29/2005	Suffolk Community College
4/29/2005	Nassau Community College - Physics & Engineering
5/5/2005	The Roundtable at Stony Brook University
5/6/2005	City College of New York - IEEE Chapter
5/10/2005	Suffolk Community College
5/10/2005	Suffolk County Commissioner of Public Health Services
5/12/2005	Senator Schumer's Staff
5/12/2005	Invision
5/13/2005	Literacy Volunteers of America
5/17/2005	NASA Users' Workshop
5/26/2005	SUNY at Farmingdale - Institute of Retirement and Learning
6/6/2005	Stony Brook University Research Experience for Undergraduate (REU) Students
6/7/2005	OEP Summer Program Students
6/20/2005	DOE - Materials Science Review for BES
6/20/2005	Nuclear Chemistry Summer Students
6/24/2005	DOE Contractor Attorneys Conference
6/28/2005	Stony Brook University - BioPrep Program
7/6/2005	Columbia University REU Students
7/11/2005	Stony Brook University - Garcia Center for Material Science
7/12/2005	SUNY - REU Physics & Chemistry Program

2005 NSLS Tours

7/13/2005	Korean Ministry of Government Legislation (MOLEG)
7/14/2005	Stony Brook University - Masters in Business Administration
7/21/2005	New York State Community College Summer Program
7/21/2005	Columbia University (Summer Chemistry Program)
7/27/2005	BNL QUARK.NET Summer Program
8/8/2005	Mt. Sinai Rotary Club
8/9/2005	Dr. Rohatgi - DOE Review
8/9/2005	Senior Advisor for Science and Engineering Workforce, NSF
8/12/2005	U.S. Army Recruits
8/15/2005	Senator Clinton's Washington Staffers
8/16/2005	Industrial Center Workshop
8/23/2005	Richard Gelfond
8/25/2005	IBM Group
9/14/2005	New York State Assemblyman Philip Ramos
9/16/2005	DOE - Materials Science Review for BES
9/28/2005	Merchant Marine Academy - Nuclear Engineering and Physics
9/28/2005	SUNY at Stony Brook - Biomedical Engineering Program
9/30/2005	Atomic Energy Regulatory Board
10/7/2005	Small Business Administration
10/19/2005	Green Mens Club
10/25/2005	SUNY at Stony Brook - Cytotechnology Group
11/4/2005	Suffolk Community College
11/7/2005	Green Mens Club
11/9/2005	United Federation of Teachers (retired)
11/10/2005	U.S. States Department Tour - Kazakhstan Visitors
11/14/2005	Chinese Academy of Sciences, Shanghai Institute of Applied Physics
11/15/2005	Dr. Alan Friedman, Director & CEO, New York Hall of Science
11/16/2005	Quark.Net Physics Teachers
11/22/2005	SUNY at Stony Brook - Physics Department
12/2/2005	Green Mens Club
12/6/2005	Columbia University
12/12/2005	Southern Methodist University
12/12/2005	Office of Science and Technology Policy (OSTP)
12/15/2005	Rensselaer Polytechnic Institute

2005 NSLS Workshops

1/25/2005	Synchrotron Light for Powder Diffraction
3/1/2005	X6A Workbench: Hands-On Training in Synchrotron Crystallography
4/5/2005	RapiData 2005
4/18/2005	Strain-Mapping Workshop
4/26/2005	X6A Workbench: Hands-On Training in Synchrotron Crystallography
5/10/2005	Workshop on Intense Coherent THz Pulses
5/23/2005	Nanomagnetism: Materials and Probes
5/23/2005	Synchrotron Imaging of Biominerals
5/23/2005	The Impact of Cryogenic Specimen Automounters on the Future of Macromolecular Crystallography
5/25/2005	Spectroscopic Studies of Nanoscaled Systems
5/25/2005	Application of SAXS to Biological Structures
5/25/2005	*In-Situ* Kinetic Analyses in Environmental and Chemical Systems
6/6/2005	Crystallization Workshop
6/20/2005	BioCD-2005
7/12/2005	X6A Workbench: Hands-On Training in Synchrotron Crystallography
9/19/2005	Synchrotron Environmental Science III (SES) Meeting
9/28/2005	EXAFS Course: Theory, Experiment, and Advanced Applications
10/25/2005	X6A Workbench: Hands-On Training in Synchrotron Crystallography
11/3/2005	COMPRES Sponsored Workshop on Synchrotron Infrared Spectroscopy for High Pressure Geoscience and Planetary Science