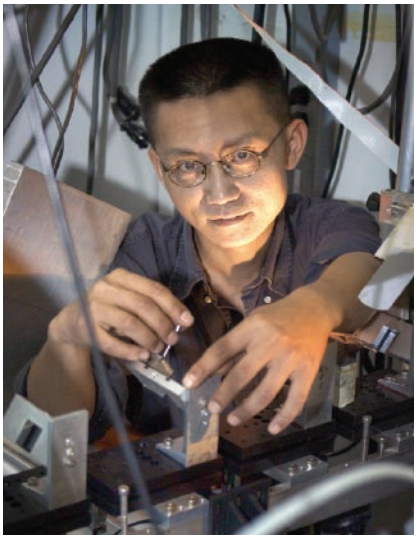
NSLS Physicist, Zhong Zhong, Awarded Tenure

June 1, 2005

BSA granted tenure on June 1 to five Brookhaven scientists. They were: Ivan Bozovic, Materials Science Department; Sergei Lymar, Chemistry Department; James Misewich, Materials Science; Werner Vogelsang, Physics Department; and Zhong Zhong, National Synchrotron Light Source Department.

Tenure appointments are granted by action of the BSA Board after a rigorous selection procedure overseen by the BSA Science & Technology Steering Committee.

In making tenure decisions, the BSA Board is advised by members of the Brookhaven Council, an elected body that advises the Director on matters affecting the scientific staff.



Zhong Zhong

At the NSLS, physicist Zhong Zhong received tenure for his contributions to instrumentation, leadership, and for his innovative and creative original research. "Zhong is widely recognized for his major and creative contributions to the design and implementation of novel x-ray optics and as the co-inventor of a new medical imaging technique that has great potential as a powerful and unique diagnostic tool," said Steven Dierker, Brookhaven's Associate Laboratory Director for Light Sources.

Conducting theoretical and experimental studies, Zhong devised a novel method for focusing high-energy x-rays and also a powerful new tool for fluorescence detection — offering scientists new ways to study previously inaccessible materials. Zhong is also coinventor of diffraction-enhanced imaging, or DEI, a technique that makes use of variations in how tissues refract and/or scatter x-rays, rather than absorption, which can be used to visualize soft tissues as well as bone at considerably lower x-ray doses than traditional radiography. DEI shows promise in diagnosing breast cancer and other soft-tissue diseases. In addition, Zhong serves as spokesperson for two NSLS beam lines, and is expected to help establish a Biomedical Imaging Research Resource at the facility.

According to Dierker, "Zhong's talent and expertise in finding creative solutions to the most challenging optics and instrumentation problems will be especially crucial at NSLS-II, which will present new and difficult instrumentation challenges to take advantage of its world-leading brightness."

Zhong received a B.S. in physics from Beijing University in 1990, an M.S. in applied physics from Michigan Technological University in 1992, and a Ph.D. in physics from Stony Brook University in 1996. He joined the NSLS as a postdoctoral research associate in 1997, and has since been promoted to assistant scientist (1998), x-ray ring manager (1999), associate physicist (2000), and physicist (2002). He has also been an adjunct assistant professor in Biomedical Engineering at Stony Brook University since 2001.

— Karen McNulty Walsh

Crystallization Workshop Gets Top Marks From Participants

June 6-8, 2005

The "Crystallization: Focus on Optimization Techniques, Soluble and Membrane Proteins" course organized by Naomi Chayen (Imperial College of London) and Vivian Stojanoff (NSLS) took place at the NSLS from June 6 through June 8. During those three days, 55 researchers from the U.S. and abroad discussed and experienced hands-on the complexity of the protein-crystal growth process.

Several lectures to introduce the subject and eight parallel practical sessions were held by experts in the field during three days. Neer Asherie (Yeshiva University) discussed "Understanding of the Protein Phase Behavior," Pat Loll (Drexel University) discussed the "Effects of Detergents," Marie Claude Marchand (Nextal) discussed the "Vapor Diffusion Method and

Crystallization Workshop attendees

Optimization Techniques," Gwen Nneji (Imperial College of London) discussed "Non-standard Crystallization Techniques," Petra Fromme (Arizona State University) discussed "Phase Diagrams: A Way for the Rational Design of Membrane Protein Crystallization," and Peter Nollert (deCODE Genetics) discussed "Micro Crystallization Using the Lipidic Cubic Phase Methodology."

The practical sessions also included talks on "Purification Tech-

niques" by Janmeet Anand and Debbie Cohen (GE Healthcare), "The Light Scattering as a Diagnosis of Protein Purity" by Trevor Harvard (Precision Detectors), and "High-Throughput Screening of Crystallization Conditions" by Chris Gawronski (Fluidigm).

The 40 participants were divided into eight groups and rotated through the two-hour practical sessions. The course was designed to allow participants to experience different crystallization techniques and discuss the available optimization tools. The importance of protein purity and knowledge of phase diagrams were stressed in several lectures and practical sessions. Participants had the opportunity to try the different methods on standard or known proteins, such as lysozyme, thaumatin proteinase K, photosystem I, and bacteriordopsin.

Several participants brought their own proteins and tried the different methods and screening techniques to screen or optimize crystallization conditions. They used plates from Nextal, Hampton Research, Douglas Instruments, Molecular Dimensions, and Jena Biosciences. Several participants characterized their proteins by light scattering using the system provided by Precision Detectors, first finding possible improvements in the crystallization conditions they were using.

Overall, all the participants recommended organizing similar workshops in the future, as this is the only course in the U.S. that offers real experience in protein crystallization.

— Laura Mgrdichian

BioCD-2005

June 20-24, 2005

An intensive weeklong course on circular dichroism (CD) was presented at the NSLS at Brookhaven National Laboratory, from June 20-24.

CD is the difference in absorption of left and right circularly polarized light. It is observed in the spectral regions of absorption of molecules that are chiral, i.e. lacking a center of symmetry. While most CD spectra are small — only a tiny fraction of the total absorption — biopolymers with helical structures, such as proteins, DNA, RNA and polysaccharides, exhibit informative CD spectra.

The objective of BioCD-2005 was to acquaint the participants with the theory of ultraviolet CD spectroscopy, techniques, and instrumentation for acquiring CD data with laboratory and synchrotron-source instruments, as well as computational tools for analysing CD spectra, with special emphasis on determinations of the net secondary structure of proteins.

The motivation for a new course on CD spectroscopy is due, in part, to recent advances in CD spectrometers and accessory equipment, plus the development of new software for data analysis. The initial synchrotron beamlines for CD spectroscopy were built at Tantalus and SURF II, moving to Aladdin and the NSLS, respectively, when these facilities opened. Within recent years, there has been a significant increase in interest in synchrotron radiation CD (SRCD). NSLS beamline U11 is being commissioned as a dedicated facility for UV CD spectroscopy and the Synchrotron Radiation Source at Daresbury (United Kingdom) recently brought beamline 12.1 online in the same role. SRCD instruments are also operating at the Institute for Storage Ring Facilities in at the University of Århus in Denmark, BESSY II in Berlin, HiSOR in Hiroshima, and the Beijing Synchrotron Radiation Facility. Additionally, there are plans for new CD beamlines at the Diamond Light Source in the UK and at SOLEIL in France.

Students attending BioCD-2005 were from the United States, the UK, Sweden, Ireland, Portugal, and Mexico, and included graduate students, postdoctoral researchers, and established investigators from industrial and governmental laboratories. Lectures were presented by Bonnie Wallace and Lee Whitmore (Birkbeck College, University of London), Robert Janes (Queen Mary College, University of London), John Sutherland and Lisa Miller (BNL), and Eugene Stevens (State University of New York at Binghamton). Sutherland, Wallace, Janes, and Miller organized the course. John Trunk, Denise Monteleone. and Michael Appel provided technical support. The hands-on laboratories included data collection on beamlines U9B and U11

BioCD-2005 participants

plus a conventional (lab-based, commercial) CD spectrometer. On-line data analysis of protein structures used the DichroWeb web site, based at Birkbeck College in London.

Topics covered by the workshop included: "Principles of CD Spectroscopy," "CD of Proteins, Analyses of Protein Secondary Structures and Practical Considerations in Measurements of CD Spectra," "Instrumentation for CD and SRCD," "CD Bioinformatics," "Demonstrations of Software for CD Spectroscopy," "Time Resolved Spectroscopy," "CD of Membrane Proteins," "Data Bases for Analysis of CD Spectra," "CD of Nucleic Acids and Polysaccharides (ES)," "Vibrational Spectroscopy," and "Linear Dichroism and Applications of SRCD to Structural and Functional Genomics". The workshop ended with an open dis-

cussion on the future of CD and SRCD in structural molecular biology.

BioCD-2005 was supported by the Office of Biological and Environmental Research within the U.S. Department of Energy's Office of Science, and BNL's Biology and NSLS departments.

— John Sutherland

Changes to NSLS User Access Policy

June 30, 2005

Important changes to operations at the NSLS were incorporated into the NSLS User Access Policy. This policy will support the NSLS in its mission to perform outstanding science in a safe and environmentally friendly manner. The document outlines the general policies for user access to the NSLS and is designed to ensure open and fair access to the NSLS by the scientific community at large, to sustain the highest standards of scientific and technical excellence, and to be responsive and adaptable to varying user needs and funding realities. The policy changes were made after consulting with the NSLS User Executive Committee and were approved by the NSLS Science Advisory Committee.

Facility Beamlines
One major change in the new policy is the creation of "facility" beamlines, which are controlled and managed by the NSLS. At least 75% of the available beam time on each facility beamline will be allocated to general users and one or more contributing users, with at least 50% of the available beam time going to general users.

Contributing Users
Another major change is the establishment of a new mode of user access, known as contributing users (CUs). CUs are individuals or groups who carry out research at facility beamlines as well as enhance the capabilities of those beamlines or contribute to their operation. CUs typically develop instrumentation in some manner, bringing external financial and/or intellectual capital into the development of the beamlines or making an external contribution to the operation of the beamlines. To encourage involvement, and in exchange for supporting the general user program, CUs may be recognized for their investments by receiving a specified percentage of beam time on one or more beamlines for a period of up to three years, with the possibility of renewal. The first group of CUs will be selected on September 1, 2005.

The new NSLS User Access Policy can be found at: *http://www.nsls.bnl.gov/newsroom/publications/manuals/ppm/.*

— Chi-Chang Kao

NSLS Scientists Recognized by the American Physical Society

June 30, 2005

Three NSLS user researchers —Jan Genzer, Thomas Russell, and Gabriel Aeppli — were honored with prestigious American Physical Society (APS) awards. Additionally, two other NSLS scientists — user Robert Bartynski and the NSLS' own Li-Hua Yu — were elected as fellows of the APS.

"For his highly creative manipulation of surface properties via monolayer and macromolecular films," Genzer, a materials scientist at North Carolina State University, was awarded the Dillon Medal.

The Polymer Physics Prize went to Russell, a polymer scientist with the University of Massachusetts. He was cited "for his pioneering research and fundamental elucidation of the surface and interfacial behavior of polymers."

Aeppli, a condensed matter physicist with University College London, received the Oliver Buckley Prize "for fundamental contributions to experimental studies of quantum spin dynamics and spin coherence in condensed matter systems."

Bartynski, a condensed matter physicist at Rutgers University, was elected "for pioneering experiments to determine the electronic properties of surfaces, especially for leadership in developing Auger Photoelectron Coincidence Spectroscopy (APECS) with synchrotron radiation as a tool for local electronic structure."

Yu, a beam physicist at the Deep Ultraviolet Free-Electron Laser at the NSLS, was elected "for creative contributions to the theory of self-amplified spontaneous emissions and high-gain harmonic-generation, and the experimental demonstration of the high-gain harmonic-generation free-electron laser."

More information on the awards is available at *http://www.aps.org.praw/05winners.cfm.*

— Laura Mgrdichian


Jan Genzer


Thomas Russell


Gabriel Aeppli


Robert Bartynski


Li-Hua Yu

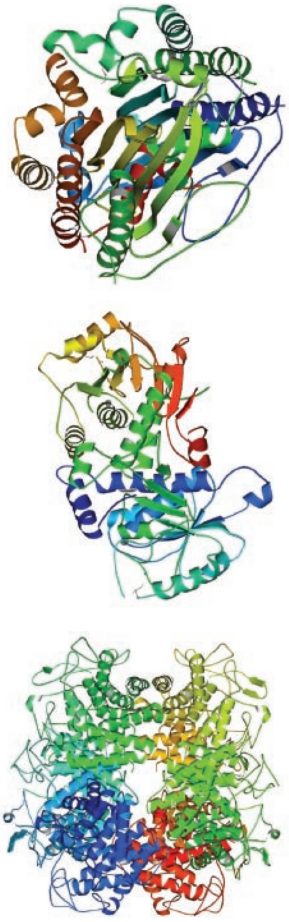
Protein Rush at the NSLS

July 1, 2005

In the spring of 2005, the Protein Structure Initiative (PSI) launched the second phase of its national effort to find the three-dimensional shapes of a wide range of proteins. This is good news for the NSLS, since many of those structures will be determined here. But more importantly, the structural information will help reveal the roles that proteins play in health and disease and will help point the way to designing new medicines.

The highlight of the PSI second phase was the announcement of 10 new research centers, which marks the second half of the decade-long initiative. The centers are slated to receive about $300 million in grants over the next five years.

When the PSI established its pilot centers in 2000, its goal was twofold: to develop innovative approaches and tools, such as robotic instruments, that streamline and speed many steps of generating protein structures, and to incorporate those new methods into pipelines that turn DNA sequence information into protein structures.



Three protein structures determined at the NSLS as part of the Protein Structure Initiative (Images courtesy www.nysgrc.org.)

Now, the focus shifts to production. The new centers will use methods developed during the pilot period to rapidly determine thousands of protein structures found in organisms ranging from bacteria to humans. These efforts will facilitate structure determination on a much larger number of proteins through computer modeling.

The PSI production phase includes two types of centers. Four large-scale centers, established during the pilot phase, hope to generate between 3,000 and 4,000 structures. Six smaller, specialized centers will develop novel methods for quickly determining the structures of proteins that traditionally have been difficult to study. These include small protein complexes, proteins that attach to a cell's outer "skin," or membrane, and many proteins from higher organisms, including humans.

As before, the PSI centers will submit their structures and related findings to the Protein Data Bank, an NSF- and NIH-supported public repository of three-dimensional biological structure data.

The Protein Structure Initiative is funded largely by the National Institute of General Medical Sciences (NIGMS) and also receives funding from the National Center for Research Resources. Both centers are part of the National Institutes of Health.

More on how BNL and NSLS are involved

In 2000, an organization called the New York Structural GenomiX Research Consortium was formed as part of the PSI pilot program. During the pilot period, members of this consortium developed many innovative methods and determined approximately 200 new protein structures. The majority of these structures were deciphered at the NSLS, with about 50 of them being determined by Brookhaven scientists. In fact, two of the consortium's principal investigators are Brookhaven Lab biologists Subramanyam Swaminathan and William Studier.

In the second PSI phase, the Brookhaven group will continue to solve structures at the NSLS and work to improve their methods. Over the five years, the consortium will receive approximately $48 million, with about $9.5 million of that supporting research at Brookhaven Lab.

The consortium's other member institutions are Albert Einstein College of Medicine, Mount Sinai School of Medicine, The Rockefeller University, and Weill Medical College of Cornell University.

— Laura Mgrdichian

Highlights from the 2005 NSLS Summer Sunday

August 7, 2005

An enthusiastic crowd of 700-plus visitors came to the National Synchrotron Light Source on August 7 as part of Brookhaven Lab's Summer Sundays program, crowding the lobby, seminar room, and front patio to see what the NSLS had in store for them. The program welcomes the public to the Lab on several consecutive Sundays in the summer, highlighting a different facility each week.

Out on the patio there were several fun, interesting exhibits

Guests arrived at Berkner Hall, where an NSLS scientist first gave a brief NSLS overview talk and discussed how

Summer Sunday volunteers help young guests build "crystals" out of toothpicks and gumdrops

they use the NSLS to perform their own research. From there, visitors boarded a bus to the NSLS.

There were many things to do and see at the facility. Fifteen hands-on displays were set up in the lobby, seminar room, and patio to show visitors how the NSLS works and teach them about the science performed there. For example, the new "Electron Catapult" display showed visitors how different amounts of energy are required to propel an electron from an atom's "ground state" level to higher levels. This concept is key to many NSLS experiments.

"MC" Gerry Van Derlaske with a happy raffle winner

At the "Crystals: Unlocking the Secrets of Life" display, many kids had a great time building "crystals" from toothpicks and gumdrops — some left with gigantic creations!

Another, always popular display was "Sounds of Silence," where guests watched how a vacuum pump caused Marshmallow Peeps to expand and then, when turned off, to shrivel down to a smaller size than when the experiment began. Guests learned that the shrunken candies were still edible (perhaps even tastier that way).

And at "See the Light," visitors could see actual synchrotron light, guided to the lobby from the experimental floor by a fiber-optic cable.

Upon entering the building, each guest received a quiz with several questions that could be answered by visiting each display. Every finished quiz was handed in and redeemed for an NSLS keychain flashlight and, every half-hour, one quiz was selected raffle-style to receive another prize

Volunteer Ted Feldman shows visitors how the "Electron Catapult" display works

A steady stream of visitors filled the NSLS lobby

— an NSLS baseball cap or BNL polo shirt.

Always a powerful sight for guests are the lobby and second-floor viewing windows that look down over the NSLS experimental floor. Looking down across the expanse of hardware, aluminum foil, and wiring is always fascinating for first-time visitors. At both windows, NSLS scientists were available to answer questions. Large neon numbers placed on the floor clearly labeled various components.

Outside the building, on the patio, NSLS scientists demonstrated how solar cars and water rockets worked, among other fun and interesting toys.

Three successful crystal-builders

The day's success was made possible by many volunteers: Marc Allaire, Michael Appel, Steve Bennett, Mike Buckley, Wolfgang Caliebe, Shailendra Chouhan, John Dabrowski, Elaine Di Masi, Matt Engel, Larry Fareria, Ted Feldman, Ed Haas, Sarah Heins, Steve Hulbert, Anubav Jain, Ariane Kretlow, Kathryn Krycka, Tony Kuczewski, Tony Lanzirotti, Alan Levine, Andreana Leskovjan, William Little, Ebrahim Mahajna, Corinne Messana, Laura Mgrdichian, Laura Miller, Lisa Miller, Eileen Morello, Wendy Morrin, Susila Ramamoorthy, Perumal Ramasamy, Lydia Rogers, Ray Raynis, Meghan Ruppel, Sami Khouri Salameh, Sharadha Sambasivan, Cecilia Sanchez-Hanke, Anne Schirmer, Randy Smith, Peter Stephens, Raji Sundaramoorthy, Tejas Telivala, Heather Turbush, Gerry Van Derlaske, Adele Wang, Gary Weiner, Marty Woodle, Nancye Wright, Lin Yang, and Zhong Zhong.

— Laura Mgrdichian

Meet the NSLS Summer Students of 2005

August 31, 2005

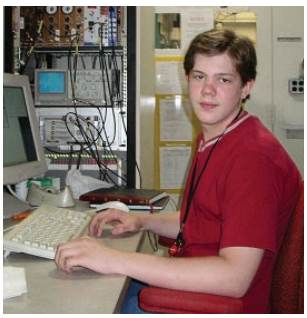
Each summer, a number of high school and college students perform research projects at the NSLS. Most of the students work at the NSLS as part of Laboratory-sponsored research internship programs.

The students work with scientists and engineers from the department in a wide range of research fields: medical sciences, geology and environmental sciences, chemistry, materials science, physics, and electrical and mechanical engineering. The students also attend scientific lectures, tour BNL research facilities, and participate in numerous social activities.

Jeff Borack

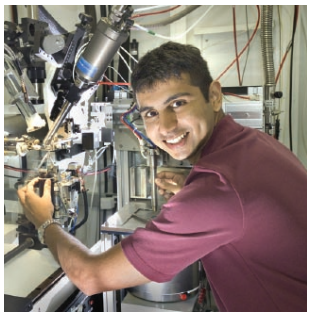
Interested students apply to these programs in the spring and the programs range from six to 10 weeks long. More information and application procedures can be found on the BNL Science Education website at *http://www.bnl.gov/scied/*.

Jeff Borack, now a senior at SUNY Binghamton, spent his summer trying to determine how to differentiate between two forms of chronic lymphocytic leukemia (CLL). In his project, developed by Dr. Nick Chiorazzi from the North Shore Long Island Jewish Hospital and NSLS scientist Lisa Miller, he analyzed B-cells (a type of white blood cell) using an infrared microscope. This research may lead to the development of a new diagnostic tool capable of helping doctors and patients determine which treatment options are best for CLL.



Michael DiBiccari

For the past two summers, **Michael DiBiccari**, a senior at Hauppauge High School, has worked with Elaine DiMasi, studying the growth process of biological minerals. They examined the diffraction patterns of x-rays that reflected off the mineral crystals, which helped them understand how the crystals formed. This research will be helpful in understanding the process of biomineralization.



Anubhav Jain

Anubhav Jain is now a senior at Cornell University. Both this summer and last, he worked with NSLS scientist Vivian Stojanoff, developing software to help automate the process of determining the molecular structure of proteins. This research will help structural biologists get three-dimensional structures of proteins more quickly, allowing scientists to develop treatments

Jean Christian Brutus

Jean Christian Brutus is a sophomore at Stony Brook University. This summer, he worked with engineer John Skaritka in the NSLS design room. His project involved designing a superconducting undulator (a device used in synchrotron rings), manufacturing it, and finding a way to wind and cool down the system. This undulator will be used as an insertion device for the electron accelerator in NSLS-II, the planned NSLS successor.

Gabriel Sanchez

Gabriel Sanchez, a senior at Stony Brook University, worked with mentor Cheo Teng, the NSLS systems administrator. His project involved systems/network administration. The NSLS uses Hewlett-Packard UniX machines to monitor the daily operations and data collection of the particle accelerators. These machines are configured on a network; Sanchez' objective was to successfully add another machine to this existing network. This involved the setup of a Network Information Service, the Domain Name System, and a Network File System.

Theodore Feldman

Theodore Feldman, now a junior at Stony Brook University, worked with Lisa Miller studying compositional changes in developing mouse bone. They used infrared microspectroscopy to study changes in the chemical makeup of bone as it mineralizes by analyzing the infrared spectrum of bone's organic and inorganic components. This work may help elucidate the role chemistry plays in determining bone strength and quality, which may be used to better treat and diagnose osteoporosis and similar bone diseases.

Matthew Engel

Matthew Engel worked with NSLS scientist Marc Allaire on a protein crystallography project. The particular protein he isolated and worked with is from

Ebrahim Mahajna, Mahmoud Simri, and Sami Khouri Salameh

the capsid (protein coating) of a human virus that surrounds its DNA and controls infectivity. Solving the protein's structure will allow researchers to engineer capsids with less ability to produce an immune-system response or even target specific membrane receptors.

Ebrahim Mahajna, Mahmoud Simri, and Sami Khouri Salameh are seniors at Ben Gurion University in Israel. They performed research at the NSLS as part of a U.S. Department of Energy Cooperative Research Program. Simri, working with Vivian Stojanoff, crystallized a protein and determined its structure using x-ray crystallography. Salameh, with Lisa Miller, studied a potential therapy for skin melanoma by imaging skin cancer cells using infrared light. Mahajna worked with Zhong Zhong and Avraham Dilmanian, studying whether diffraction-enhanced imaging could detect early stages of Alzheimer's disease.

— Laura Mgrdichian

NSLS-II Gets CD-0!

September 9, 2005

The Laboratory received fantastic news in September 2005: The Department of Energy granted "Critical Decision Zero" (CD-0) status to National Synchrotron Light Source-II, the planned world-leading NSLS successor. This is the key first step in the long process to make NSLS-II a reality at Brookhaven.


ALD for Light Sources Steve Dierker

Accompanied by Lab Director Praveen Chaudhari and Steve Dierker, Associate Laboratory Director for Light Sources, DOE Brookhaven Site Office Manager Michael Holland announced the news at an NSLS All-Hands meeting on Friday, September 9.

"This is a tremendous step forward for science," said Holland. "The effort that went into this by Steve Dierker and others on the project was tremendous. I thank everyone for their hard work and accomplishments."

Holland noted that as part of the process that leads to CD-1, the next critical decision for the project, the physical site for the facility will be chosen, determining whether NSLS-II will be located at BNL. "There will certainly be a strong case made for NSLS-II at Brookhaven. There is an awful lot of work ahead of us in the next eight to 12 months," he said.

DOE Brookhaven Site Office Manager Michael Holland

In his comments, Chaudhari congratulated the NSLS staff and many others for their efforts in maintaining the NSLS while working to make the case for NSLS-II. "You ought to take a moment and clap for yourself," he said. "It's been difficult to keep the NSLS running and design a new machine. You are going to have to continue to work very hard, but I expect that you can do it."

Dierker called the announcement a "wonderful occasion." He then presented an overview of the history of the NSLS-II project, from the initial idea to the proposal to the major reviews by DOE, as well as the large and successful NSLS-II workshop in March 2004 — all the results of hard, hard work and cooperation. He thanked everyone for helping to achieve this critical milestone and emphasized the continuing teamwork necessary to continue the process and secure the site.

"There is a strong research community in the Northeast and a tremendous density of academic and research institutions," he said. "Moreover, U.S. synchrotrons are far oversubscribed. We need NSLS-II more than ever, or the science and benefits from that science will move overseas."

— Laura Mgrdichian


Lab Director Praveen Chaudhari

Synchrotron Environmental Science III (SES) Meeting

September 19-21, 2005

On September 19-21, the Synchrotron Environmental Sciences III (SES III) conference was held at Brookhaven National Laboratory (BNL). Continuing the tradition established by previous SES conferences held at Argonne National Lab, SES-III brought together the diverse community of scientists who apply

synchrotron-based radiation techniques to study the biological and geochemical aspects of both local and global environmental issues. The conference included two days of topical sessions that addressed the application of innovative synchrotron methods in environmental science along with applications in bioavailability and remediation science. The third day included a workshop on microbeam methods. Attendees reported on environmental science activities conducted at synchrotron facilities worldwide.

The SES meetings are an outgrowth of EnviroSync, a grass roots organization with almost 400 members established in early 1998 to represent the growing multidisciplinary community of synchrotron radiation users who focus on molecular environmental science problems (*http://www.cems.stonybrook.edu/envirosync/history.html*). Stephen Sutton (GSECARS, University of Chicago) has been Chair of EnviroSync since 2002. An EnviroSync open meeting was also held as part of the SES-III conference, during which Richard Reeder (Stony Brook University) was elected as the new EnviroSync Chair and John Bargar (Stanford Synchrotron Radiation Lab) its Secretary for 2005-2007.

Synchrotron Environmental Science III (SES-III) Meeting attendees

BNL Director Praveen Chaudhari opened the SES-III conference with very supportive comments emphasizing the increasingly important role environmental science research plays at BNL and how well suited light sources are to answer the questions asked by environmental scientists. There were also welcoming remarks from Martin Schoonen, Stony Brook University's Associate Vice President for Research, and Creighton Wirick, Chair of BNL's Environmental Sciences Department. Steve Dierker, BNL's Associate Lab Director for Light Sources, then gave an update on the National Synchrotron Light Source (NSLS) and in particular the progress that the NSLS has made in bringing additional beamlines into operation that support environmental science users. He emphasized that this is need driven by the rapidly increasing number of environmental science users at the NSLS and the over-subscription of beamlines that cater to the community. Steve also updated the attendees on the status of NSLS-II, which was recently granted "Critical Decision Zero" (CD-0) status by the Department of Energy (DOE). NSLS-II is a proposed new state-of-the-art medium energy storage ring designed to deliver world leading brightness and flux with top-off operation for constant output. DOE program managers Nicolas Woodward (Basic Energy Sciences – Geosciences Research Program) and Roland Hirsch (Biological & Environmental Research – Environmental Remediation Sciences Division) also gave updates on DOE support for environmental research and how these programs have stressed availability of synchrotrons to earth and environmental scientists. Todd Anderson from the Office of Biological & Environmental Research was also in attendance.

Gordon Brown (Stanford University) opened the scientific presentations of the first day with an overview of recent environmental science activities that have been made possible by using synchrotron-based approaches, as well as future possibilities. The first day's sessions also included talks by Ken Kemner (Argonne National Lab), Neil Sturchio (Univ. Illinois), Sanjit Kumar Ghose (GSECARS, Univ. Chicago), David Shuh (Lawrence Berkeley Lab), and Lynda Soderholm (Argonne National Lab). Talks on the first day focused on the use of innovative synchrotron based techniques in biogeosciences and how studies of mineral surfaces can employ x-ray standing wave imaging, resonant anomalous x-ray reflectivity, and crystal truncation rod scattering. There were also discussions about the application of soft x-ray emission spectroscopy, resonant inelastic x-ray scattering, and extended x-ray absorption fine structure investigations in the study of actinides. The first day concluded with a poster session.

Sessions on the second day included a number of talks on the application of synchrotron techniques to biological-environmental systems. Topics included metal ions in living systems, the structural chemistry of bacteriogenic manganese oxides, the reduction of U(VI) by Fe(II) at cell surfaces, and the application of synchrotron infrared microspectroscopy to environmental studies. There were also discussions of the use of multiple synchrotron x-ray techniques in the study of plant-metal-soil interactions, the effect of microbial siderophores on Pb speciation and adsorption, and the application of synchrotron micro-diffraction in prediction of environmental risks associated with arsenic-bearing mine wastes. Attendees also heard about the benefits of combining x-ray and neutron scattering techniques for obtaining fundamental information about processes of importance to environmental sciences. Speakers included Graham George (Univ. of Saskatchewan), John Bargar (Stanford Synchrotron Radiation Lab), Maxim Boyanov (Argonne National Lab), Stefan Vogt (Argonne National Lab), Lisa Miller (Brookhaven National Lab), Ryan Tapperro (Univ. of Delaware), Bhoopesh Mishra (Univ. of Notre Dame), John Parise (Stony Brook Univ.), Heather Jamieson (Queen's Univ., Canada), and Matthew Ginder-Vogel (Stanford Univ.). The day's sessions concluded with a classic Long Island clambake, where attendees gorged themselves on fresh lobsters, clams, and mussels well into the evening.

The meeting concluded with a workshop on the application

of microbeam methods to environmental sciences. Workshop speakers included Steve Sutton, Daniel Grolimund (Swiss Light Source), Matthew Marcus (Lawrence Berkeley Lab), Mary Gilles (Lawrence Berkeley Lab), and Chris Jacobsen (Stony Brook Univ.). The speakers described beamlines at the Advanced Photon Source, Advanced Light Source, National Synchrotron Light Source, and the Swiss Light Source and applications of hard x-ray microbeam fluorescence, absorption, diffraction, and tomography techniques and soft x-ray spectro-microscopy techniques for characterization of environmental materials.

Overall, the meeting proved to be a rousing success, and everyone looks forward to SES-IV in the near future. This workshop was co-sponsored by EnviroSync, the National Synchrotron Light Source, the Center for Environmental Molecular Science (Stony Brook Univ.), Brookhaven National Laboratory, Stony Brook University, the National Science Foundation, and the Department of Energy.

— Antonio Lanzirotti

The 2005 NSLS Barbeque Wraps Up the Year

September 23, 2005

The unusually warm, sunny weather of September 23 did not hint at the cool autumn days to come, but did make for an enjoyable 2005 NSLS Barbeque. However, it was the NSLS staff members in attendance, particularly the service and spotlight-award winners, that made the event memorable.

NSLS Chairman Steve Dierker

Service Awards
Nick Gmur and Dennis Carlson were honored for 30 years of service at Brookhaven Lab, and 25-year awards went to Shu Cheung, John Klug, Gloria Ramirez, and Peter Zuhoski.

In the 20-year category were Erik Johnson, Eileen Morello, Mihai (Mike) Radulescu, Lydia Rogers, David (Peter) Siddons, and Yong-Nian Tang. Mary Anne Corwin and Zhijian Yin celebrated 10 years.

Not available to receive their awards at the barbeque were Wayne Rasmussen, for a very impressive 40-year award; John Bohenek for 25 years of service; Sorin Pop, Leonard Pharr, and Madeline Hughes for 20 years; and Syed Khalid and Elio Vescovo for 10 years.

Spotlight Awards
The Spotlight awards are tributes to NSLS staff members who have shown exceptional dedication to their jobs during the year. This year, the winners were: John Aloi, nominated by Bob Casey; Angela Bowden, nominated by Laura Miller; Michael Caruso, nominated by Gary Nintzel; Bob Kiss, nominated by Gerry Van Derlaske; Patrick Moylan, nominated by Ed Haas; Dennis Poshka, nominated by Anthony Kuczewski; John Vaughn, nominated by Gloria Ramirez; and Zhijian Yin, nominated by Peter Siddons.

Steve Dierker presents a 30-year service award to Nick Gmur

John Aloi: John installed and commissioned a complex request-tracking system for the User Science Division that keeps a more accurate record of requests. The system, a significant programming effort one would expect to take several months, took John just a month and a half. This effort involved many late hours, during which John experimented with and tested the system. Now, jobs are easier to monitor and requests are handled much more efficiently.

Angela Bowden: For five weeks in April and into May, Angela worked under the pressure of a tight deadline to bring the NSLS into compliance with a Department of Energy "Corrective Action" item. She volunteered to learn two new computer programs, and then used them to create more than 3,000 safety warning labels for hazardous equipment on the NSLS experimental floor. All the labels were accurate and completed before the deadline.

Michael Caruso: Caruso is recognized for providing invaluable assistance to the NSLS Vacuum Group over the past several years. Notably, he helped develop a coating process that greatly reduces the time necessary to coat a ceramic chamber, and then used the method to titanium-coat three ceramic chambers. He demonstrated excellent knowledge and skills in vacuum processes, and all three chamber coatings proved to have excellent mechanical and electrical properties.

Bob Kiss: In response to a Brookhaven Lab directive, Bob crafted and implemented new and improved procedures for the NSLS Hoisting and Lifting program. He created new check-out sheets tailored for equipment at each beamline, came up with an NSLS-specific rigging-training program, took control of 49 NSLS overhead cranes by preventing unauthorized people

A group of NSLS staff members watch the awards ceremony

from operating them, and assigned to each beamline a person responsible for hoisting and lifting activities at that beamline. These actions helped make the NSLS experimental floor a safer place.

Patrick Moylan: Pat demonstrated exceptional initiative and written skills by putting together Worker Qualification and Training forms for the Mechanical Tech Group, which falls outside of his own training and work area. On top of that, he put together a training program designed to enhance on-the-job safety in the x-ray ring tunnel for workers who need unescorted access to the tunnel. He then presented that training to all NSLS staff, to inform them of potential hazards in the tunnel.

Dennis Poshka: By starting up a verification and maintenance routine for the facility beamline user interlock systems, a project he undertook on his own accord, Dennis uncovered many beamlines in which legacy interlocks were disconnected or inadequately instrumented. Identifying these interlocks prevented a potentially huge loss of equipment and greatly added to the measure of safety at the NSLS.

John Vaughn: After a period of repeated beam dumps on the x-ray ring in 2004, caused by random trips of a faulty power supply, John assisted in several studies to trace the origin of the trips in the power supply. When nothing surfaced, he set up diagnostics, and logged and charted events to establish a correlation between the trip frequency and the x-ray ring maintenance periods. These efforts led him to a solution after months of efforts by other staff members did not.

Zhijian Yin: Zhijian installed and commissioned a complex request-tracking system for the User Science Division over a very short time period. He discovered an open-source software package that fit the needs of the division and successfully incorporated it into the existing email, web, and database servers. This complex task involved many extended hours of experimenting and testing to make sure the software worked properly. Since then, more than 100 requests have been tracked without problems and the system has proved to be easy to use and efficient.

— Laura Mgrdichian

SBU Student Wins First Dr. Mow Shiah Lin Scholarship

September 27, 2005

Yuanzhi Tang, a graduate student in the Department of Geosciences at Stony Brook University (SBU), won the first annual Dr. Mow Shiah Lin Scholarship. The Asian Pacific American Association (APAA) at the Lab initiated the scholarship, which consists of $1,000 and a plaque, to honor the late distinguished Brookhaven Lab scientist for which it is named.

Mow Shiah Lin began his career at BNL in 1975 as a postdoctoral fellow and advanced to co-lead a research team working with an environmental remediation company to use selected bacteria to convert toxic oil wastes, such as used motor oils, into useful products. In 2001, Lin shared the R&D 100 Award, given by R&D Magazine to the top 100 technological achievements of the year, for a technology to recover silica from geothermal brine. Lin died suddenly due to a brain aneurysm at the height of his career in 2003, and his fellow employees, friends, and family contributed funds to establish the scholarship.

With Mow Lin Scholarship winner Yuznhi Tang (fifth from left) in the photo are: (from left) Susan Eng Wong, co-coordinator, APAA; Thomas Butcher, BNL scientist and head of the scholarship selection committee; Satoshi Ozaki, BNL scientist/administrator and APAA advisor; Beth Y. Lin, APAA co-coordinator and widow of Mow Shiah Lin; Lucinda Lin, daughter of Beth and Mow Shiah Lin; Richard J. Reeder, Director, SBU Center for Environmental Molecular Sciences and thesis advisor for Tang; Samantha Lin Alvarado, daughter of Beth and Mow Shiah Lin; Marie Van Buren, member of the APAA scholarship committee, and (front, center) Josephine Alvarado, granddaughter of Beth and Mow Shiah Lin.

In honor of Lin's research, achievements, and inventions, the scholarship will be granted annually to an Asian immigrant with a student visa who is matriculating toward a graduate degree at an accredited institution of higher education in environmental science, biology, or chemistry, in remembrance of the manner in which Lin began his career.

Tang's research at SBU involves the use of various analytic techniques — including x-ray imaging at the NSLS — to study the mechanisms of the reaction of contaminants in natural environments, especially reactions at the interfaces of minerals and water.

— Diane Greenberg