

Successful Science, Exciting Plans, Record Attendance Characterize This Year's Annual NSLS Users' Meeting

May 20 - 22, 2002

The excellent scientific record of the past year, plans for upgrades of the NSLS, and projects for new light source facilities were all hot topics at this year's Na-

tional Synchrotron Light Source (NSLS) Annual Users' Meeting, held at BNL on May 20 to 22.



Among the speakers at the 2002 Annual NSLS Users' Meeting were: (from left) Satoshi Ozaki, Richard Osgood, Steven Dierker, all of BNL; Patricia Dehmer, DOE; Leemor Joshua-Tor, Cold Spring Harbor Laboratory, NSLS Users' Executive Committee (UEC) Chair-Elect; Simon Bare, UOP-LLC, NSLS UEC Chair; and John Marburger, Presidential Science Adviser and Office of Science & Technology Policy Director.

The meeting, which drew a record attendance of 380 participants coming from all over the world, consisted of a one-day plenary session and eight one-day-long workshops on the latest results achieved at the NSLS in the physical, biomedical, environmental, and instrumentation sciences.

Speakers included: Steven Dierker, NSLS Chair; Richard Osgood, Associate Laboratory Director for Basic Energy Sciences; Patricia Dehmer, Associate Director of Science for Basic Energy Sciences (BES) at DOE; Judith Vaitukaitis, Director of the National Center for Research Resources, National Institutes of Health; and Satoshi Ozaki, Acting Deputy Laboratory Director for Science & Technology. John Marburger, Presidential Science Adviser and Director of the Office of Science & Technology Policy, was the meeting's keynote speaker.

In the plenary session, Ozaki opened the meeting by welcoming the participants and giving an overview of the major Laboratory programs. Osgood followed

with an outline of the re-organization of the material science effort at BNL and the major initiatives within the BES directorate, in particular, a proposed BNL nanoscience center.

U.S. Representative Felix Grucci (R-New York, First District), who was scheduled to speak at the meeting, was detained in Washington. In a message read by meeting chair Leemor Joshua-Tor, Cold Spring Harbor Laboratory, Grucci praised the current and future scientific programs at the NSLS.

In his keynote address, Marburger said, "We are beginning the 21st century with a profound revolution in science based on capabilities in computing and instrumentation. These capabilities have achieved an importance as the foundations of contemporary science that earns them a top priority for support. The National Synchrotron Light Source is one of the key representatives of this new instrumentation."

Dierker highlighted the qualities that make the NSLS such a successful facility. "With more than 2,500 scientists from over 400 institutions per year coming from academic, industrial, and government institutions, the NSLS is a widely used facility," he said. "Not only do we have a large contingent of users, but also, last year, the users produced more than 800 publications based on research performed at the NSLS, 150 of which appeared in premiere science journals."

In terms of budget, Dierker announced that DOE had recently added \$600,000 to the NSLS budget for FY02. An additional \$1.6 million is also contained in the President's FY03 budget request. "Altogether, we



Lonny Berman, BNL, Leemor Joshua-Tor, Cold Spring Harbor Laboratory; Steven Dierker, BNL, Simon Bare, UOP-LLC.



Users' Executive Committee Chair Simon Bare (right), UOP, LLC, presents a photo of the NSLS to Office of Science & Technology Policy Director John Marburger.

are looking at an increase of \$2.2 million next year," Dierker said. "We are very grateful to DOE and Congress, and we are excited about the opportunities that this additional funding will allow."



Patricia Dehmer, Associate Director of Science, Office of Basic Energy Sciences, DOE.



The 2002 Annual NSLS Users' Meeting Organizing Committee includes: (from left) Lisa Miller, BNL; Mary Ann Corwin, BNL; Caroline Kisker, BNL; Nancye Wright, BNL; Dan Fischer, National Institute of Standards & Technology; Lydia Rogers, BNL; Leemor Joshua-Tor, Cold Spring Harbor Laboratory; Lonny Berman, BNL; Anatoly Frenkel, Yeshiva University.

Approximately 40 of the 55 posters at the NSLS Annual Users' Meeting poster session, organized by Lisa Miller (NSLS) were the work of students and postdocs.



Dierker also discussed some changes under way at the NSLS that will improve support for current and future users. One major change has been an administrative reorganization, to provide better coordination for project management and to place greater emphasis on support for user science. "We expect these changes to increase productivity and to enable our users to obtain better research results," he said.

In announcing longer-term plans, Dierker first hailed a recent achievement by one of the near-term future light sources, the deep ultraviolet free electron laser (DUV-FEL). Last February, the DUV-FEL generated light at 400 nanometers (billionths of a meter) by a process called self-amplified spontaneous emission process.

By fall, Dierker added, the DUV-FEL is expected to provide radiation at 88 nanometers, to be used in pioneering chemistry experiments. To advance be-

yond current NSLS performance by increasing beam brightness while reducing pulse length, Dierker announced plans for a new facility, which would benefit from two technological approaches.

One, based on an ultra-low emittance storage ring, would provide about a factor of 10,000 increase in brightness. The other, called Photoinjected Energy Recovery Linac (PERL), would produce high brightness and very short pulse lengths.

"The design would start with an ultra-low emittance storage ring and evolve toward a PERL approach as that technology develops," Dierker said. The new facility would be located adjacent to the x-ray ring.

During her presentation on the current programs managed by DOE-BES, Dehmer was enthusiastic about the current and future projects at the NSLS. "Steve Dierker has done a tremendous job over the



(From left:) Mark Chance, Albert Einstein College of Medicine; Judith Vaitukaitis, Director, National Center for Research Resources, National Institutes of Health; Patricia Dehmer, DOE; and Richard Osgood, BNL.



(From left:) Stefan Kycia, LNL, Campinas, Brazil; Cam Hubbard, Oak Ridge National Laboratory; and Peter Stephens, Stony Brook University.

past year in rethinking the challenges that face the NSLS," she said.

Another new project discussed at the meeting was a center dedicated to the study of the infinitesimally small. Called the Center for Functional Nanomaterials, or Nanocenter for short, this new BNL facility has received a "very strong thumbs up" from initial reviews by DOE-BES, according to Ozaki.

The Nanocenter will be organized similarly to the NSLS, including laboratory clusters, user and visitor laboratories, and training and seminar facilities, and is expected to be built close to the NSLS and the Instrumentation Division.

"The NSLS and the Nanocenter will be portals to each other," said Osgood, who masterminded the Nanocenter project. "We envision both of these facilities as helping each other maintain a strong and vigorous user base."

"Brookhaven's Nanocenter will be a bold departure from business as usual in the research communities of materials sciences and chemistry," Dehmer commented. "We are trying to change the face of small science by locating a lot of disciplines in one place, so that, if scientists want to pursue a research program that mixes chemistry, biology and materials science, then they can do it."

Marburger, in his keynote address, outlined some of the new changes facing science in the 21st century.

"Scientists are opening the doors to a new kind of science," Marburger said. "Never before had we been able to relate properties of large-scale matter and



Lunch under the "big top" next to Berkner Hall on Tuesday, May 21.

big things made of atoms to the detailed atomic structure. Now, we can, and the prospects are truly exhilarating.

"I look forward to seeing what comes out of this Laboratory, as well as others that I fully expect society to continue to support," he added.

During the workshops and part of the plenary session, scientists presented current research and future light source projects. They addressed topics as diverse as the use of synchrotrons in the environmental sciences, the study of ultra-fast processes with x-rays, nanoscale materials, membrane protein crystallography, catalysis, materials processing, synchrotron micro-spectroscopy and imaging, and the development of more advanced light source detectors.

— Patrice Pages

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Hiroshi Takahashi (left), BNL, and Rick Bradanick, VAT Inc.



(From left:) Janos Kirz, Stony Brook University; Thomas Vogt, BNL; Richard Osgood, BNL; and Peter Paul, BNL Interim Director.