

Advanced Accelerator Concepts Progress at 11th Workshop

"The best AAC workshop ever," said participants of the 11th Advanced Accelerator Concepts (AAC) Workshop that was held at Stony Brook University (SBU), June 21-26. Sponsored by the Advanced Technology R&D Group, Office of High Energy Physics, within DOE's Office of Science; SBU; BNL; and Advanced Energy Systems of Medford NY, the workshop attracted over 190 participants from nine countries, including 47 students.

"This unprecedented level of attendance reflects the advances being made in this field," said

AAC Workshop Chair Ilan Ben-Zvi, who leads BNL's Accelerator Test Facility (ATF).

Advanced accelerator physics covers long-term research and development (R&D) in accelerator physics, including R&D of new concepts, devices and technologies in accelerator and beam physics. At BNL, this research is carried out mostly at the Physics Department by two groups: the Advanced Accelerator group led by Senior Physicist Robert Palmer and Ben-Zvi's ATF team. The ATF is the first advanced accelerator facility designed and built to serve the

community of advanced accelerator research.

Some of the topics in Advanced Accelerator R&D are laser acceleration of ions and electrons, wake-field acceleration, novel high power radio frequency sources, new diagnostics, free-electron lasers, and high-brightness electron-beam generation.

Laser acceleration methods cover many approaches, such as the use of beam or laser driven plasma wake-fields, electromagnetic structure-based acceleration, and others.

The scientific program of the June workshop included 21 plenary invited talks and eight parallel working groups. The presentations of the plenary talks and the summary of the working groups are available on the workshop's web site at <http://www.bnl.gov/atf/AAC04.htm>.

Talks on some research highlights included Chan Joshi, University of California, Los Angeles, who described accelerating electrons by a plasma wake at SLAC's E164X experiment, where electrons at 28 billion-electron-volts (GeV) gained 4 GeV in 10 centimeters of plasma; Lawrence Berkeley National Laboratory's Wim Leemans, who discussed generating and accel-



Ilan Ben-Zvi, Accelerator Test Facility (ATF) Director, talks with a group of workshop participants who are visiting the facility.



At the Accelerator Test Facility (ATF), Vitaly Yakimenko (left), ATF Deputy Director, explains ATF equipment to Amit Kesar of the Massachusetts Institute of Technology, a workshop participant.

erating electrons by a laser-plasma wake field, achieving over 85 million-electron-volt (MeV) energy with excellent beam quality over a distance of a few millimeters in a tabletop device; and Victor Malka of the *Laboratoire d'Optique Appliquée*, France, who spoke on high beam quality high-energy 170 MeV produced by laser plasma wake-field acceleration.

The workshop program included a visit to BNL, including the ATF, the Relativistic Heavy Ion Collider, and the National Synchrotron Light

Source, a user's facility plenary session at Berkner Hall and dinner, hosted by BSA.

Said Ben-Zvi, "Organizing the workshop to become such a success involved a lot of hard work by many individuals, who included: At BNL, Marcus Babzien, Kelly Bergesen, Karl Kusche, Elaine Lowenstein, Bob Malone, Igor Pogorelsky, Triveni Srinivasan-Rao, Kathy Tuohy, Pat Tuttle and Vitaly Yakimenko; and at Stony Brook, Paul Grannis, the staff of the office of conferences and special events and the Student Activity Center staff."

Litvinenko, Wei Elected APS Fellows

Vladimir Litvinenko and Jie Wei, both of the Collider-Accelerator Department (C-A), were elected Fellows of the American Physical Society (APS). With over 43,000 members, APS promotes the advancement and diffusion of the knowledge of physics in the belief that an understanding of the nature of the physical universe will be of benefit to all humanity. Each year, no more than one-half percent of the society's membership are recognized by their peers for election to the status of Fellow. Litvinenko and Wei were among a total of 215 new Fellows elected in 2003.

Vladimir Litvinenko's Fellowship citation reads: "For fundamental and pioneering contributions to the physics of beams in electron storage rings and free electron lasers, including demonstrating the optical klystron and advancing the short wavelength limit of FEL [free electron laser] oscillators."

An FEL is a research tool that combines the focus of lasers and the intensity of synchrotrons, and it is useful in studying a wide variety of materials and chemical interactions. Litvinenko and his team built a number of FELs based on the design of an optical klystron, an advanced version of an FEL. In 1988 and 1999, their team was the first in the world to extend the range of an FEL to the ultraviolet wavelength and to the vacuum ultraviolet, respectively. This work makes possible a wider variety of experiments in numerous scientific fields.

A frequent guest researcher at BNL, Litvinenko joined the Lab as a senior physicist

in 2003. Currently, he is deputy group leader of the electron-cooling project for the Relativistic Heavy Ion Collider (RHIC), BNL's newest accelerator. The goal of this project is to increase RHIC's luminosity, which would result in more productive particle collisions, and, thus, more data collected in a shorter time. "With the increased luminosity, we will collect five to ten years of data from RHIC in one year," Litvinenko said.

Jie Wei's citation reads: "For his outstanding and creative contributions to the design and development of RHIC and SNS [Spallation Neutron Source]."

Wei started working on the design of RHIC in 1986, when he was a graduate student in physics at Stony Brook University. He joined BNL as a research associate in 1989, and continued to work on various topics in accelerator physics related to keeping the beams of gold ions in RHIC stable and on course. At RHIC, physicists are gaining

insight into the nature of matter as it existed just after the Big Bang.

When RHIC's construction started in 1991, Wei was part of a team of physicists and engineers who analyzed each of the 1,740 superconducting magnets in the accelerator to be sure they were built and functioned according to specifications. Wei placed correction magnets in strategic locations in the collider so that RHIC's luminosity could be improved in the future.

Named a physicist in 1995, Wei, who joined BNL in 1989, is now a C-A research and development manager. Since 1998, he has been

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Vladimir Litvinenko



Jie Wei

Environmental Awards Won By Upton Reserve Developers

Three scientists and an administrator working at BNL have been awarded U.S. Environmental Protection Agency (EPA) Region 2 "Environmental Quality" awards for developing and managing the Upton Ecological & Research Reserve, a 530-acre conservation area located within the Lab.

The awardees are Timothy Green, BNL's Natural Resource Manager; Frank Crescenzo, Deputy Manager of DOE's Brookhaven Site Office; and Peter Kelly and Jeremy Feinberg, visiting wildlife biologists with the U.S. Fish & Wildlife Service (USFWS). The awards were presented at the EPA Region 2 headquarters in New York City on April 23.

Green, Crescenzo, Kelly, and Feinberg were nominated for their "outstanding management of the Upton Ecological and Research Reserve" and "were instrumental in transitioning the forethought of the DOE into a significant habitat reserve that is dedicated to protecting the quality of the Central Long Island Pine Barrens ecosystem."



At the Upton Reserve site are Environmental Quality Award winners: (from left) Frank Crescenzo, Deputy Manager of DOE's Brookhaven Site Office, Jeremy Feinberg, U.S. Fish & Wildlife Service biologist, and Tim Green, BNL's Natural Resource Manager. Peter Kelly, U.S. Fish & Wildlife Service biologist, was not available for the photo.

"We are greatly appreciative of this recognition of the Upton Ecological and Research Reserve," said Green. "The partnership between DOE and USFWS, along with the coordination efforts of Brookhaven Lab, have served to foster a renewed effort for ecological research in the Central Pine Barrens of Long Island."

The reserve has funded several data-acquisition projects, such as a vegetation map of Brookhaven Lab, deer population surveys, and exotic plant invasion studies. Reserve funds have also supported Pine Barrens-related research and have been used to create

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