

# NSLS's Podobedov Wins APS Award For Outstanding Thesis Research

April 21, 2002

Boris Podobedov of the National Synchrotron Light Source (NSLS) Department has won the American Physical Society's (APS) 2002 Award for Outstanding Doctoral Thesis Research in Beam Physics & Engineering.



*Boris Podobedov*

The annual award was established in 1990 by the APS Division of Physics and Beams, and it is currently supported by Brookhaven Science Associates, Southeastern Universities Research Association, and Universities Research Association.

"I am honored to receive this award, which is related to my studies at the Stanford Linear Accelerator Center," said Podobedov. "Since I came to BNL in 1999, I've been applying similar techniques to study beam dynamics at the NSLS rings."

The award, which consists of \$2,500 and a certificate, was announced at an APS meeting in Albuquerque, New Mexico, on April 21.

Podobedov was cited "For an experimental study of the microwave instability in the Stanford Linear Collider (SLC) damping rings using a streak camera to correlate each event to the RF. The development of this sophisticated technique provides a powerful tool for the study of non-linear instabilities above threshold."

Most storage rings, whether used as light sources or high-energy physics accelerators such as SLC, require high beam current. When the current is increased, electrons or other types of stored subatomic particles reach a critical density and various kinds of instabilities tend to occur, which degrade beam quality.

For example, microwave instability affects internal bunch structure - the way in which particles are grouped together in a beam - which is often hard to measure. Using some novel diagnostics as well as an instrument called a streak camera, Podobedov measured the bunch shape evolution of unstable electron and positron beams at the SLC rings. In his award-winning thesis, Podobedov was able to show understanding of the detailed structure of the instability and to identify the mechanism that caused it.

At the NSLS, Podobedov has led a team of NSLS staff in designing and implementing the digital orbit-feedback system. This system stabilizes electron beam motion, which in turn results in more stable syn-

chrotron light for experiments.

Installed in the vacuum ultraviolet (VUV) ring since August 2000, the system measures the displacement of electron orbit due to various factors such as floor vibrations or electrical noise, and then uses small magnets to correct for it. Currently, Podobedov is working on adapting this system for the NSLS x-ray ring. His other projects include work on possible upgrade options for the NSLS, and experimental studies of collective beam dynamics in the VUV ring.

Podobedov received his M.S. in physics from the Moscow Institute of Physics and Technology, Russia, in 1993, and his Ph.D. in applied physics from Stanford University in 2000. He joined BNL in October 1999 as an assistant scientist at the NSLS and was promoted to associate physicist in 2001.

-Diane Greenberg

*[Editor's note: Reprinted with permission from the BNL Bulletin - May 17, 2002.]*

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