

## PREFACE

BNL hosted the 2011 Particle Accelerator Conference (PAC'11) in New York City from March 28 to April 1, 2011 at the New York Marriott Marquis Hotel in New York City, located in midtown Manhattan on Times Square. This was the 24th in the series of Particle Accelerator Conferences that started in 1965 in Washington, D.C., but also is the first of the newly formed regional North American PAC. The regional North American PAC will alternate with the International PAC when it is located in North America on a three-year cycle.

PAC'11 was very successful. Chaired by Thomas Roser, with Vladimir Litvinenko as Science Program Committee Chair, Michael Sivertz as Local Organization Committee Chair and Anna Petway as the Conference Coordinator, it attracted 1040 accelerator scientists, engineers, students, including 162 industrial exhibitors. About 16% of the participants came from Europe and 4% from Asia. The event also continued the traditional strong emphasis on all aspects of accelerator science and technology by providing the opportunity for a large number of oral and poster presentations.

The conference opened on a sober note as Roser and Litvinenko expressed deep sympathy to all victims of the March 11 earthquake and tsunami in Japan and wished all Japanese a fast and full recovery to normality.

Three plenary talks brought to light the role and the future promise of accelerators for fundamental scientific discoveries in high-energy physics, nuclear physics, and photon sciences. Industrial and medical applications of accelerators were given a prime spot in the program. Speakers covered a wide range of benefits that accelerators bring to society: from homeland security to advanced cancer treatment facilities.

Big colliders — the Large Hadron Collider (LHC) at CERN, Switzerland; the Tevatron at Fermi National Accelerator Laboratory; and RHIC — had their traditional spotlight in the program. The audience was excited to learn about steady LHC progress towards its luminosity goals, the top-notch performance at the Tevatron, and new milestones in RHIC's unique polarized proton program. During invited talks about the electron-positron collider at KEK, in Tsukuba, Japan, and the J-PARC facility in Tokai, Japan, a large audience learned first-hand of the devastation to these major accelerator facilities resulting from the March 11 earthquake.

The success and plans of the X-ray Free Electron Laser (FEL) in SLAC National Accelerator Laboratory and the promise of the next cohort of light sources — at NSLS II and MAX-IV in Sweden — dominated the “photon” hemisphere of the conference. Future projects planning to utilize unique features of energy recovery linacs, or linear accelerators, were also presented. They ranged from plans for a traditional incoherent light source at Cornell University and a soft-X-ray FEL source in Thomas Jefferson National Accelerator Facility (JLab) to an X-ray FEL oscillator suitable for eRHIC.

Exciting topics covered in the advanced accelerator section included plasma accelerators that are now demonstrating dramatic progress both in the energy (reaching tens of billions of electron volts in a less than a meter) and the quality of the generated beams. Progress in novel methods of cooling muon and hadron beams was another highlight.

On the engineering side, two dominant themes were progress with superconducting radio frequency accelerators and also with synchronizing accelerator and laser components at the femtosecond time scale. All future accelerator facilities — from the Facility for Rare Isotope Beams (FRIB) at Michigan State University to Project-X, a proposed high intensity proton accelerator complex at Fermilab — were presented at the conference. The wealth and diversity of accelerator research was covered in 147 talks and nearly one thousand posters.

As a new addition to the Particle Accelerator Conference, four excellent one-hour tutorials were added as introductions for junior members of the accelerator science community and, in fact, anyone who wanted to broaden his or her knowledge. The tutorials were very popular, filling the lecture hall at 8:30 in the morning each day.

Following longstanding tradition, PAC'11 held the Louis Costrell Honorary Awards Session, where winners of the APS-DPB outstanding doctoral thesis award in beam physics, and the IEEE-NPSS Particle Accelerator Science and Technology award and doctoral student award and new fellows were presented. The most prestigious award of the ceremony — the APS Robert R. Wilson prize for Achievements in the Physics of Particle Accelerators — was awarded to Yaroslav Derbenev from JLab.

On the evening before the official start of the conference, 90 graduate students participated in a student poster contest. The quality of the posters was so high that the number of the \$500 awards for best posters needed to be increased from two to three this year. PAC'11 offered student travel grants, sponsored by APS DPB and BNL, to 47 student participants. The grants varied in amount, ranging from \$685 to \$1,360.

On Wednesday evening a reception was held for the Women in Engineering and Science, sponsored by IEEE-NPSS, the BNL Diversity Office and Agilent Technologies. The event, attended by about 300 conference participants, was a great success.

One of the many achievements of the conference was the work of the editorial team, led by the two co-editors Todd Satogata and Kevin Brown, which, for the first time, processed and published PAC'11 pre-proceedings online before the closing bell of the conference.

During the conference, Derek Lowenstein, BNL, organized a very successful High School Teachers Day, sponsored by APS DPB. The event was open free-of-charge to high school physics teachers and 31 teachers from the area attended for a day of instruction and hands-on experiments.

Following the conference, approximately 100 conference participants joined a bus tour to BNL where they visited the new electron beam ion source (EBIS) pre-injector and the NSLS-II project, as well as the Accelerator Test Facility and the Energy Recovery Linac test facility.

Thomas Roser



Conference Chair

Vladimir Litvinenko



SPC Chair