

## PREFACE

The third International Particle Accelerator Conference, IPAC'12, took place at the Ernest N. Morial Convention Center, New Orleans, Louisiana, USA from Sunday to Friday, May 20-25, 2012. It was attended by about 1100 full-time participants from approximately 30 different countries on five continents. IPAC12 was held under the auspices of the Institute of Electrical and Electronics Engineers (IEEE) Nuclear and Plasma Sciences Society; the American Physical Society, Division of Physics of Beams (APS-DPB).

The organizers of IPAC'12 are most grateful for support from Louisiana State University and the U.S. Department of Energy, Office of Science, and additional sponsorship from COSYLAB; DIMTEL; Muons, Inc.

Furthermore, the attendance of 86 young scientists from all over the world was made possible through the sponsorship of societies, institutes and laboratories worldwide (in alphabetical order): APS-DPB; Asian Committee for Future Accelerators (ACFA); CELLS-ALBA; Centro Fermi; CERN; Cockcroft Institute; DESY; Diamond Light Source; ESS; Forschungszentrum Jülich; Helmholtz Zentrum Berlin; Helmholtz Zentrum Darmstadt (GSI); Helmholtz Zentrum Dresden Rossendorf; IEEE, Nuclear and Plasma Sciences Society; IFIC; INFN; IN2P3; JAI; PSI; SOLEIL; STFC Daresbury Laboratory. The organizers of IPAC'12 are grateful to all sponsors for their valuable support.

The conference was opened by Vic Suller, Jeff Corbett, and Kevin Morris, respectively the Chairs of the IPAC'12 Organizing, Scientific Program, and Local Organizing Committees.

Joachim Stohr (SLAC) opened the scientific program with a presentation on *The Scientific Revolution Enabled by X-ray Free Electron Lasers*, followed by *The First Two Years of LHC Operation* presented by Steve Myers (CERN). Closing presentations were given by Hans-Heinrich Braun (PSI) on *The Future of X-ray FELs*, Paul Derwent (FNAL) on *Accelerators for Intensity Frontier Research*, and Rolf Heuer (CERN) on *Physics Results at the LHC and Implications for Future HEP Programmes*.

One hundred and seven invited and contributed oral presentations of very high quality were made during the week, including a fascinating "Entertainment" presentation entitled *LIGO, the Laser Interferometer Gravity-wave Observatory* by Rainer Weiss of the Massachusetts Institute of Technology.

The scientific program was developed by the IPAC'12 SPC. It was a truly international body with members coming 50% from North American and 50% from Europe and Asia. The conference program spanned four and a half days, with plenary sessions on Monday and Friday mornings, and Thursday afternoon. All other sessions were composed of two oral sessions in parallel in the morning and three oral sessions in parallel in the afternoon, with the poster sessions scheduled alone at the end of each afternoon. There were 59 invited talks and 48 contributed oral presentations, as well as 1250 posters and 53 electronic posters (e-posters) scheduled during the lively poster sessions scheduled at the end of each afternoon. These proceedings contain the reports of 1375 contributions.

An industrial exhibition took place during the first three days of the conference. Industrial exhibitors occupied 89 booths and presented their high technology products and services to the delegates in an excellent atmosphere conducive to discussions.

The Best Student Poster Prizes, presented by Jeff Corbett (SLAC) and Kay Wittenburg (DESY), were awarded to Theodoros Argyropoulos (CERN) for his contribution entitled *Thresholds of Longitudinal Single Bunch Instability in Single and Double RF Systems in the CERN SPS* and to Chen Xu (Jefferson Lab

and College of William and Mary) for his contribution entitled *Analysis of High Field Non-linear Losses on SRF Surfaces Due to Specific Topographic Roughness*.

The IEEE/NPSS Particle Accelerator Science and Technology Student Thesis Award, intended to recognize significant and innovative technical contributions to the field of particle accelerator science and technology as demonstrated in a student's doctoral thesis, was presented by Ilan Ben-Zvi (BNL) to Erdong Wang (BNL) "For contributions to the physics of high quantum-efficiency photocathodes."

The APS DPB Outstanding Doctoral Thesis Research in Beam Physics Award, which recognizes doctoral thesis research of outstanding quality and achievement in beam physics and engineering, was presented by Ilan Ben Zvi (BNL) to Daniel Ratner (SLAC) for his thesis *Much Ado About Microbunching: Coherent Bunching in High Brightness Electron Beams*.

The IEEE Particle Accelerator Science and Technology (PAST) Award was presented by Ilan Ben-Zvi (BNL) to two individuals who have made outstanding contributions to the development of particle accelerator science and technology. Hasan Padamsee (Cornell University) was awarded the 2012 IEEE/NPSS PAST Award "For contributions to the science and technology of RF superconductivity." Vitaly Yakimenko (BNL) was also selected as the winner of the 2012 IEEE/NPSS PAST Award "For contributions to high-brightness electron beams and to their application to advanced accelerators and light sources."

The proceedings of IPAC'12 are published on the JACoW site ([www.jacow.org](http://www.jacow.org)). There will be no hard copy volumes. The processing of the electronic files of contributions prior to, during and immediately after the conference was achieved by the JACoW "seasoned experts," who also trained less experienced volunteers from the JACoW Collaboration. The team was composed of 25 persons from laboratories worldwide, many accomplishing several different tasks ranging from IT (setting up the computers and network), to processing of contributions and transparencies, to author reception and cross-checking of titles and authors. Thanks to the work of this dynamic team and the careful preparations and guidance of Cathy Eyberger (ANL), Christine Petit-Jean-Genaz (CERN), and Todd Satogata (Jefferson Lab), a pre-press version with over 1000 contributions was published by the end of the conference. The final version, with the invaluable assistance of Volker Schaa, Chairman of JACoW, was published at the JACoW site just five weeks after the conference. This is yet another impressive record set by the JACoW Collaboration.

The success of IPAC'12 was due in great part to the truly excellent collaboration between the international teams of the OC and the SPC, and the LOC. Membership of the LOC, under the leadership of Kevin Morris (Center for Advanced Microstructures & Devices [CAMD] at Louisiana State University) included the following staff: H. Bellamy (CAMD), R. Cooper (CAMD), L. Day (CAMD), M. Dockery, C. Eyberger (ANL), J. Goettert (CAMD), S. Holmes (FNAL), P. Jines (CAMD), E. Knott (CAMD), D. Launey (CAMD), V. Mitts (CAMD), C. Petit-Jean-Genaz (CERN), A. Roy (CAMD), T. Satogata (Jefferson Lab), J. Scott (CAMD), C. Stevens (CAMD), D. Torres (LSU), and M. White (ANL).

The high levels of participation and enthusiasm shown at IPAC'12 clearly indicate the strong mandate for the International Particle Accelerator Conference series from the worldwide accelerator community. The fourth IPAC will take place May 13-17, 2013 in Shanghai, China. We are convinced that the collaboration between the three regions, steadily enhanced in recent years, will continue to grow to the benefit of IPAC and the accelerator community worldwide.

Vic Suller, Chair of the IPAC'12 Organizing Committee