



## PREFACE

The fourth International Particle Accelerator Conference, IPAC'13, took place at the Shanghai International Conference Center, Shanghai, China from Sunday to Friday, 12 to 17 May, 2013. It was attended by close to 1000 full time delegates from approximately 30 different countries on all continents. Hosted by the Shanghai Institute of Applied Physics (SINAP) and the Institute of High Energy Physics (IHEP), Beijing, it was supported by the Asian Committee for Future Accelerators (ACFA), the American Physical Society Division of Physics of Beams (APS-DPB), the European Physical Society Accelerator Group (EPS-AG), the International Union of Pure and Applied Physics (IUPAP), the Chinese Academy of Sciences (CAS) and the National Natural Science Foundation of China (NSFC).

Furthermore, the attendance of over 85 young scientists from all over the world was made possible through the sponsorship of societies, institutes and laboratories worldwide (in alphabetical order): ACFA, APS-DPB, CAS, EPS-AG with contributions from ALBA-CELLS, Centro Fermi, CERN, CNRS-IN2P3, DESY, Diamond Light Source, ESRF, GSI, HZB, HZDR, IFIC, JAI, Max Lab, PSI, Synchrotron Soleil and STFC/Cockcroft Institute, and IUPAP. The organizers of IPAC'13 are grateful to all sponsors for their valuable support.

The conference was opened by Zhentang Zhao, Chuang Zhang and Zhimin Dai, respectively the Chairs of the IPAC'13 Organizing Committee (OC), Scientific Programme Committee (SPC) and Local Organizing Committee (LOC).

Wen-Long Zhang (CAS) opened the scientific programme with a presentation on the *ADS Programme and Key Technology R&D in China*, followed by *Challenges Facing High Power Proton Accelerators* presented by Michael Plum (ORNL). The other plenary talks on Monday morning were presented by Mike Lamont, CERN, Victor Malka (LOA) and Zhirong Huang (SLAC) on respectively *The First Years of LHC Operation for Luminosity Production*, *Review of Laser Wakefield Accelerators*, and *Brightness and Coherence in Synchrotron Radiation*.

Inspiring closing presentations were delivered by Dong Wang (SINAP) with *An Overview of Light Source Development in Asia*, Sergio Bertolucci (CERN) on *Recent LHC Physics Results and their Impact on the Future HEP Accelerator Programme*, and Yifang Wang (IHEP) on *Recent Progress of Neutrino Experiments and Requirement to Accelerators*.

Ninety-five invited and contributed oral presentations of very high quality were made during the week, including a fascinating "Entertainment" presentation on the Chinese painting and calligraphy.

The scientific programme was developed by the IPAC'13 SPC. It was a truly international body with members coming 50% from Asia and 50% from Europe and North America. The conference programme 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, with the poster sessions scheduled alone at the end of each afternoon. There were 44 invited talks, 51 contributed oral presentations, and 1300 posters were scheduled during the lively poster sessions at the end of each afternoon. These proceedings contain the reports of 1300 contributions.

An industrial exhibition took place during the first three days of the conference. Industrial exhibitors (83 companies) occupied 91 booths and presented their high technology products and services to the delegates in an excellent atmosphere conducive to discussions.

During the Accelerator Awards Session, the best student poster prizes were awarded to Yichao Mo (UMD, College Park, Maryland) for the contribution entitled *Experimental Study of Soliton Wave Trains in Electron Beams* (TUPWA058), and to Julia Marie Vogt (HZB, Berlin) for the contribution entitled *Studies of Systematic Flux Expulsion in Superconducting Niobium* (WEPWO004).

The prize for an individual in the early part of his or her career, having made a recent, significant, original contribution to the accelerator field, went to Hiroshi Imao of RIKEN, for his realization of the next-generation charge-state stripper using recirculating helium gas. This stripper has made it possible to increase the intensity of uranium-ion beams by an order of magnitude at RIKEN's Radioactive Isotope Beam Factory and has had immense impact on the

field of heavy-ion accelerators worldwide. He also developed a compact and efficient positron accumulator that has led to the successful production of antihydrogen atoms in the ASACUSA experiment at CERN.

The prize for an individual having made a recent, significant contribution to the accelerator field with no age limit, was awarded to Michael Borland of the Advanced Photon Source, Argonne, for his original contributions in creating the ELEGANT program and its self-describing data sets platform. These are widely applied in the design, simulation and analysis of circular accelerators, energy-recovery linacs and free-electron lasers. His algorithms, methods and software have been adopted at many accelerator facilities around the world, for numerous developments in the field of beam dynamics and non-linear optimizations.

The prize for outstanding work in the accelerator field with no age limit was awarded to Shouxian Fang of the Institute of High Energy Physics Beijing. He led the team that constructed the Beijing Electron-Positron Collider (BEPC), China's first high-energy accelerator, and has contributed to the Shanghai Synchrotron Radiation Facility, the China Spallation Neutron Source and the Chinese Accelerator-Driven Subcritical System for nuclear-waste transmutation, as well as to proton-therapy accelerators and to initiating the major upgrade of BEPC (BEPCII). He has also promoted accelerator-based science in China through extensive international collaboration and built up a solid bridge between China and other parts of the world in the accelerator field.

The ACFA/IPAC'13 prizes were presented by the Chairman of ACFA, Professor M. Nozaki, and the Chairman of the Prizes Selection Committee, Professor Jia-er Chen, NSFC and PKU. Zhentang Zhao (SINAP, Shanghai), Chair of the OC, and Chuang Zhang (IHEP, Beijing), Chair of the SPC, presented the student poster prizes.

The proceedings of IPAC'13 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 30 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 Christine Petit-Jean-Genaz, CERN, a pre-press version with 1300 contributions was published at mid-day on the last day of the conference. The final version, with the invaluable assistance of Volker Schaa, Chairman of JACoW, was published at the JACoW site just three weeks after the conference. This is yet another impressive record set by the JACoW Collaboration which is sincerely grateful to the supervisors of all of the editors, releasing them from their usual duties.

The success of IPAC'13 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 Zhimin Dai, SINAP included the following staff: Haixiao Deng, Ying Fan, Xin Han, Zhengchi Hou, Weicheng Hu, Bocheng Jiang, Yongbin Leng, Haohu Li, Yahong Li, Liren Shen, Heping Yan, Lixin Yin, Jungfeng Yu, Wenzhi Zhang, Wei Zhou, SINAP and Christine Petit-Jean-Genaz, CERN.

The high levels of participation and enthusiasm shown at IPAC'13 clearly indicate the strong mandate for the International Particle Accelerator Conference series from the worldwide accelerator community. May future events be even more successful than this one. The fifth IPAC will take place in Dresden, Germany (Sunday to Friday, 15-20 June, 2014). We are convinced that the collaboration among the three regions, steadily enhanced in recent years, will continue to grow to the benefit of IPAC and the accelerator community worldwide.

Zhentang Zhao, SINAP, Chair of the IPAC'13 Organizing Committee