



PREFACE

The tenth International Particle Accelerator Conference, IPAC'19, took place at the Melbourne Conference and Exhibition Centre, Melbourne, Victoria, Australia from Sunday to Friday, May 19 to 24, 2019. IPAC'19 was attended by 1,186 delegates from 32 countries on all continents. The total includes 146 industry and exhibitor delegates. Hosted by the Australian Nuclear Science and Technology Organisation (ANSTO). ANSTO was established in 1953 (originally as the AAEC) and is the home of Australia's most significant landmark and national infrastructure for research. ANSTO's infrastructure includes the nuclear research reactor, OPAL; neutron beamlines; the National Imaging Facility Research Cyclotron; the Centre for Accelerator Science and in 2016 the Australian Synchrotron was integrated as a division of ANSTO. The Local Organising Committee (LOC) consisted of 12 staff from ANSTO as well as representatives from Industry and the University of Melbourne.

167 young scientists from all over the globe attended the conference. 79 of these students received travel grants thanks to the sponsorship of societies, institutes and laboratories worldwide. The Americas region grants were sponsored by APS-DB. The Europe region sponsors are: EPS-AG, GSI, CNRS/IN2P3, INFN/LNL, CERN, DESY, PSI, CEA Saclay, ELETTRA, CELLS/ALBA, HZB, ESS, Cockcroft Institute, KIT, SOLEIL, ESRF, STFC/DL/ASTeC, MAX IV, and FZJ. The Asian region was sponsored by IPAC'19 and the Victorian State Government. The organisers of IPAC'19 are grateful to all sponsors for their valued support of students.

The conference was opened by Mark Boland (CLS), Chair of the Organising Committee (OC), The Hon. Martin Pakula, Victorian State Minister for Jobs, Innovation and Trade, and Adi Patterson CEO of ANSTO, who all made welcoming remarks.

Suzanne Sheehy (JAI/UoM) and Massimo Ferrario (INFN) opened the scientific program with presentations, respectively, on 'Meeting Future Challenges in Accelerators: Innovation, Collaboration and Communication' and 'From Dream to Reality: Prospects for Applying Advanced Accelerator Technologies to Next Generation Scientific User Facilities'. The other plenary talks on Monday morning were presented by Susumu Igarashi (J-PARC/KEK), Denis Kostin (DESY) and Lucio Rossi (CERN), respectively, on 'Challenges to Higher Beam Power in J-PARC: Achieved Performance and Future Prospects', 'SRF Operation at XFEL: Lessons Learned after More than One Year' and 'Progress with the LHC Programme at CERN'.

The program was closed with illuminating presentations by Henry Chapman (DESY), 'X-ray Imaging: Faster, Smaller and Brighter'; Leonida Gizzi (INO-CNR), 'Lasers for Novel Accelerators'; and Dong Wang (SINAP), 'Overview of Light Source Developments in Asia'.

36 invited and 51 contributed oral presentations of very high quality were made during the week. The regional distribution of talks was 33% from Asia, 31% from Europe, and 33% from the Americas. The gender ratio for oral presentations was 76% male and 24% female.

The scientific program was developed by the 16-member IPAC'19 Scientific Program Committee (SPC) comprising 8 leads from Asia and 4 deputies each from the Americas and Europe under the leadership of Hitoshi Tanaka (RIKEN). Valued suggestions for invited talks were contributed by the 92-member Scientific

Advisory Board (SAB) representing accelerator laboratories world-wide. Oral sessions were grouped according to the eight IPAC Main Classifications, with Poster Sessions Grouped according to Sub Classifications. The conference program spanned four and a half days, with plenary talks on Monday and Friday mornings and on Thursday afternoon for the Accelerator Awards Ceremony. All other sessions were composed of two invited or contributed talks in parallel.

Four Poster Sessions were held each afternoon on Monday through Thursday, during which 1341 posters from 215 institutions were scheduled for presentation. 167 students from 72 institutions, representing 17 countries, attended IPAC'19, with 79 students supported via the student grant programme. The Sunday afternoon student poster session was again a successful event and saw 130 student posters presented and was judged by a team of 28 judges, organised by Toshiyuki Mitsuhashi (KEK).

These proceedings contain the reports of 1441 total contributions. The regional breakdown is 30% Asia, 26% Americas and 44% Europe. The breakdown by Main Class is as follows: MC1 Circular and Linear Colliders, 105 contributions; MC2 Photon Sources and Electron Accelerators, 289 contributions; MC3 Novel Particle Sources and Acceleration Technologies, 120 contributions; MC4 Hadron Accelerators, 181 contributions; MC5 Beam Dynamics and EM Fields, 202 contributions; MC6 Beam Instrumentation, Controls, Feedback, and Operational Aspects, 198 contributions; MC7 Accelerator Technology, 279 contributions; MC8 Applications of Accelerators, Tech Transfer and Industrial Relations, 50 contributions.

The scientific program was supplemented by a variety of special sessions and events.

A special session on Diversity in Accelerator Physics was held on the Wednesday evening. This event saw two great presentations by Dr. Robert Appleby (UMAN) and Prof. Cordelia Fine (UoM) on different aspects of Diversity and the importance of public engagement in increasing diversity in our field. This was followed by an introduction to a Wikipedia based 'Edit-a-thon' project set up to increase the visibility of our diverse community of accelerator physicists and their contributions to science. Approximately 100 delegates participated in this event.

The Industry Session was held on Wednesday and was based on the theme of building successful partnership between industry and academia. Presentations were given by Lucia Sabbatini (INFN), 'The LATINO Project - An Italian Perspective on Connecting SMEs with Research Infrastructures'; Chris Philpott (Buckley Systems), 'The light at the end of the tunnel: Light Source lessons learned'; Brian Jurczyk (Starfire Industries), 'Developing a Deployable 4-MeV Deuteron RFQ Linac for Industrial and Security Applications: Insights from a Small Business Perspective' and Michelle Shinn (US Department of Energy), 'DOE, Office of Nuclear Physics' Small Business Innovative Research (SBIR) Program'.

The APS again offered a "breakfast and learn" tutorial for aspiring authors and referees on Tuesday morning which was well attended, as well as its traditional 'Meet the editors' event on Wednesday evening, providing delegates with a chance have discussions about the Physical review journals directly with the editors.

The industrial exhibition took place from Monday to Thursday. Industrial exhibitors (62 companies) occupied 67 booths at which they presented their high technology products and services to the delegates. This industrial exhibition area featured a central networking lounge to facilitate discussion and was co-located with the poster areas. It must be acknowledged that the conference would not be possible in its present format without the generous support of the IPAC industry exhibitors and sponsors. 5 learned societies exhibited at desks during the same 4-day period.

IPAC'19 hosted a range of satellite meetings, including SPC meetings of LINAC'19 and IPAC'20 as well as the ARC Imaging CoE, XFEL serial Crystallography workshop 2019 and the NST 4 Health Conference.

The 2019 Asian Committee for Future Accelerators (ACFA) and IPAC'19 were honoured to announce the following awards during the awards session:

The Xie Jialin Prize for outstanding work in the accelerator field, with no age limit was awarded to Prof. Vittorio Giorgio Vaccaro "For his pioneering studies on instabilities in particle beam physics, the introduction of the impedance concept in storage rings and, in the course of his academic career, for disseminating knowledge in accelerator physics throughout many generations of young scientists."

The Nishikawa Tetsuji Prize for a recent, significant, original contribution to the accelerator field, with no age limit was awarded to Prof. Vladimir Shiltsev, "For his original work on electron lenses in synchrotron colliders, his outstanding contribution to the construction and operation of high-energy, high-luminosity hadron colliders and for his tireless leadership in the accelerator community."

The Hogil Kim Prize for a recent, significant, original contribution to the accelerator field, awarded to an individual in the early part of his or her career was awarded to Dr. Xueqing Yan, "For his demonstration of new experimental technique of phase-stable laser acceleration of protons and ions, in overcoming the challenges to producing high-quality beams and leading the way to realising future medical accelerators."

The Mark Oliphant Prize for a student registered for a Ph.D. or diploma in accelerator physics or engineering, or to a trainee accelerator physicist or engineer in the educational phase of his or her professional career was awarded to James MacArthur, "For his contribution to free electron laser electron beam dynamics, especially the analysis of the self-modulation mechanism, and experiments leading to sub-femtosecond pulse generation."

The prizes for best student posters were awarded to Daniel Bafia, (Fermilab & Illinois Institute of Technology) for "Understanding and Pushing the Limits of Nitrogen Doping"; and Nazanin Samadi, (CLS, University of Saskatchewan): "Application of a Phase Space Beam Position and Size Monitor for Synchrotron Radiation".

Two special awards were presented at IPAC'19 in remembrance of Greg LeBlanc, Head of accelerator science at the Australian Synchrotron and LOC chair, who sadly passed away in December 2018. The two awards are for a significant and original contribution to IPAC'19: by an individual in the early part of his or her career (up to five years after their terminal degree); and by a technical staff and/or operator. They were awarded to Dr. Tessa Charles "For her research in the theory and analysis of the first measurements of the caustic nature of trajectories in bunch compressors." and Dr. Filippou Toufexis. "For his work in radio-frequency devices, including crab cavities, radio-frequency undulators, and W-band parallel-coupled power extraction structures."

The proceedings of IPAC'19 are published on the JACoW site (www.jacow.org). The processing of the electronic manuscripts was achieved on-site by the 30 strong JACoW team from 24 different institutions prior to, and during the conference. The team, led by David Button (ANSTO), and Volker RW Schaa (GSI), includes "seasoned experts" who also trained less experienced volunteers.

The JACoW Collaboration is formed by electronic publishing experts and technicians volunteered by laboratories worldwide. Tasks performed by the proceedings office include: author reception, processing of contributions and transparencies, checking that references are formatted to journal standards, and cross-checking of titles and authors. Setting up the computers and internet network, presentations management and poster session management were a collaborative effort between the LOC and JACoW. Thanks to the work of this dedicated team, a pre-press version with all on time author's submissions published totalling more than 1,200 contributions by the last day of the conference. The final version was published at the JACoW site just weeks after the conference. This is yet another impressive record set by the JACoW Collaboration, which

is sincerely grateful to the supervisors of each of the team members for releasing them from their usual duties.

IPAC'19 would also like to acknowledge the brilliant contribution of two new tools developed by ANSTO, to assist authors and editors. These tools allowed the search and generation of JACoW paper references from a complete database of all JACoW papers, and the identification of technical and formatting errors in Word DOCX contributions. These tools are now known as the JACoW Reference Search & Generation Tool, and the JACoW Cat Scan Editor Tool. These tools have both been made available to the entire JACoW conference community, educating authors and assisting editors, and to further improve the sustainability of the conferences and JACoW. We believe these tools will have a bright future.

A new feature of IPAC, introduced on a trial basis at IPAC'17, is light peer review of a limited number of papers for publication in a volume of an Institute of Physics conference proceedings. A white paper defining the review criteria and process was developed by Koscielniak & Bogacz. Papers are reviewed by the SAB, while the SPC under the leadership of the Scientific Publication Board chair, performed the function of editorial board. Due to the untimely death of the Scientific Publication board chair, Yong Ho Chin, early in the year, Alex Bogacz once again stepped into the role, aided by members of the SPC. Candidate papers were submitted two weeks in advance of the normal deadline to allow a cycle of review, revision, and final review. Over 237 papers were submitted, many were revised, and 220 were approved. Todd Satogata managed the review process within the JACoW SPMS database.

The success of IPAC'19 was due in great part to the strong collaboration between the international teams of the OC, SPC and the LOC. Membership of the LOC included the following:

Rohan Dowd (ANSTO): LOC Chair and SPMS Administration

Eugene Tan (ANSTO): LOC Co-chair and Student Programme manager

Nicole White (Nicole White Projects): Event Project Support and Scientific Secretary

David Button (ANSTO): Proceedings Manager

Alan Cowie (ANSTO): IT Manager

Nick Hauser (ANSTO): IT Manager

Mike Lafky (ANSTO): Technical Tour Manager

Jaye Muir (ANSTO): Public Affairs

Kerry Hayes (ANSTO): Industry and Sponsorship

Dieter Pelz (RFCURRENT): Industry and Sponsorship

Dean Morris (ANSTO): Conference Support

Roger Rassool (UoM): Conference Support

It is clear that on this tenth conference of the series that IPAC remains a focus for the coming together of the worldwide accelerator community and the fruitful exchange of ideas, unbounded by nationality, experience or background. Being the first of this conference series to be hosted in the Southern hemisphere, it was especially pleasing to see a strong participation from the international community, despite the extra distance.

The eleventh IPAC will return to the Northern Hemisphere in the European super-region and will take place in Caen, France.

Rohan Dowd (ANSTO) Chair of the IPAC'19 Local Organising Committee