

ICALEPCS 2019 Proceedings

Foreword

The 17th International Conference on Accelerator and Large Experimental Physics Control Systems (**ICALEPCS 2019**) was held from the 5th October to the 11th October at the New York Marriott at the Brooklyn Bridge Conference Center, located just across the river from Manhattan in Brooklyn Heights. It was hosted by Brookhaven National Laboratory (BNL), home to the Relativistic Heavy Ion Collider (RHIC) and the National Synchrotron Light Source II (NSLS II), both world class and unique particle accelerators that support research in nuclear physics and basic energy sciences. The conference was endorsed by the European Physical Society (EPS), the Physical Society of Japan (JPS), and the American Physical Society (APS). The conference's Local Organizing Committee was advised by two committees made up of members from the three regions – the International Scientific Advisory Committee (ISAC) and the Program Committee (PC). The ISAC was comprised of 38 members and chaired by Karen White of the Spallation Neutron Source (SNS) at Oak Ridge National Laboratory (ORNL). The PC was made up of 47 members and chaired by Seth Nemesure from BNL.

ICALEPCS 2019 had strong attendance with a total of 507 registered participants, including 21 students. CERN was the most represented institute followed by BNL. The breakdown of attendees by region was as follows: 49 from Asia and Oceania, 291 from Europe, Middle East and Africa, and 167 from North and South America.

The ICALEPCS 2019 ISAC chose a theme of diversity, inclusion, and education for this instance of the conference. On Wednesday, following the lunch break, there was a panel discussion on the theme “Breaking Down Barriers to Diversity and Inclusion”. The auditorium was filled to standing room only, with 252 participants! Overall participant demographics, based on how people identified themselves at registration; 62% identified as “Mr.”, 23% identified as “Dr.”, 9% identified as “Miss.”, “Ms.”, or “Mrs.”, 5% chose not to identify themselves, and 1% identified as “Prof.”.

A total of 415 abstracts were accepted. Of these, 4 were selected as invited orals, 110 were selected as contributed orals, 35 were mini-orals with a poster presentation, 17 were speakers' corner presentations, also with a poster, and 249 were poster presentations. For the proceedings, 358 papers were uploaded and processed to be included.

ICALEPCS 2019 put a strong emphasis on quality and diverse keynote speakers. We were very pleased to introduce James Misewich, Associate Lab Director for Energy and Photon Sciences at BNL, who spoke about the history, current scientific achievements, and the future science initiatives at BNL. Jim also discussed the things BNL is doing to improve diversity and inclusion at the lab, which the lab recognizes is a key ingredient to doing great science. We were very privileged to have Florence D. Hudson, the Founder and CEO of FDHint, LLC, speak about *Building the Future Harnessing Advanced Technologies Innovations and Inclusion*. Allison Bishop, Co-Founder and President of Proof Trading, in New York, spoke on *Why Cybersecurity Should Not be Left to the Experts*. Gabriele Vajente, from CALTECH and part of the LIGO Collaboration, spoke on *Gravitational Wave Detectors: Controls at the Femtometer Level*. And, Andi Barbour, from BNL, spoke on *How Data Technology and Computational Power are Advancing X-ray Synchrotron Science*.

The conference themes were chosen by the ISAC. The scientific program was drawn up by the PC. Both committees did an excellent job choosing topics and talks and encouraging experts to present their work. Parallel sessions were necessary, as have been in the past. Out of a total of 23 sessions, 12 were parallel.

There were 10 pre-conference workshops held on the Saturday and Sunday before the conference, as well as the EPICS collaboration meeting held on Saturday. At the EPICS meeting a special celebration was held to commemorate the 30th anniversary of the collaboration.

The workshop themes were: FPGA Development, Cyber-Security, TANGO, PLC Based Systems, Motion Control, Sardana – Scientific SCADA Suite, MRF Timing, MicroTCA Applications, Data Science and Machine Learning, and Containers in Controls. The attendance of the pre-conference workshops was very high, with over 400 participants.

In addition to the above workshops, there were two tutorial themed workshops as well. One focused on using Jupyter Notebook and associated tools for data science and analysis. Two tutorials were included as part of the Data Science and Machine Learning Workshop. Alfredo Canziani from NYU introduced basic concepts of Machine Learning, discussed Classification and a Regression with Neural Networks, and finally explained Unsupervised Learning. Gianluca Valentino from the University of Malta gave a tutorial on Reinforcement learning. These tutorials and the Data Science workshop were very popular. More than 100 people attended this workshop.

Two awards were given at ICALEPCS 2019, the ICALEPCS Lifetime Achievement Award (LAA) and, for the first time, the ICALEPCS Leadership in Mentoring Award. The ICALEPCS 2019 LAA award was presented to Mark Rivers, in recognition of his contribution to the beamline controls and data analysis software framework development at the Advanced Photon Source (APS) at Argonne National Laboratory (ANL) and for his development of sharable control system software that has benefitted many laboratories around the world. The ICALEPCS 2019 Leadership in

Mentoring Award was presented to Kay Kasemir from the SNS at ORNL and Andrew Johnson from the APS at ANL in recognition of the more than two decades that they have dedicated themselves to provide extensive training and mentoring of engineers, not only in the EPICS community but beyond, to teach people how to design and build control systems.

The local organization of the conference was under the responsibility of the Local Organizing Committee (LOC). The LOC was comprised of 10 people, in addition to Seth Nemesure and ourselves. Anna Petway was the conference coordinator and managed all the details related to registration, organizing the social functions, and working closely with Nancy Boyle, the Financial Chair, to ensure we stayed on budget. Gretchen Cisco and Nancye Wright, from NSLS II, were the Exhibitor coordinators and managed the industrial exhibition. Philip Dyer, with help from Todd Satogata, Jefferson Lab, and Caitlin Hoffman, BNL, was the editor and managed the editorial room and made sure the JACoW team was well taken care of. Christina Blas-Cruz was our student program coordinator and also managed and coordinated the workshops with each of the workshop organizers. Frank Naase was our IT Manager, Bryan Callaghan was IT Coordinator, Kyle Kulmatycki provided networking and IT support, and Frank Donato handled the website and other IT support. For speaker prep and oral presentation management we had the help of Oksana Ivashkevych, NSLS II. For the diversity program we had the help of Zeynep Altinbas. Our Twitter account and news feed was managed by Prerana Kankiya. At the conference, for registration and conference support, we had the help of Lynanne DiFilippo, Christine Meyer, Tracy Blydenburgh, and Irene Brown. The Friday afternoon tour was coordinated by Doreen Cantelmo. The BNL tours were organized by Tara Shiels and over 50 folks from NSLS II, RHIC, and the BNL Magnet Division helped with the tours as guides and speakers.

The ISAC accepted the bid for ICALEPCS 2023 to be held in Cape Town, South Africa hosted by the South African National Research Foundation (NRF) and the South African Radio Astronomy Observatory (SARAO).

As co-chairs we would like to thank everyone who contributed to make ICALEPCS 2019 a successful and memorable event. The conference was the result of many people's work and support both financial and moral. It all started in 2015 in Melbourne, AU, when the ISAC of ICALEPCS 2015 accepted the BNL bid to host ICALEPCS 2019 in New York. It continued with ICALEPCS 2017 who sponsored ICALEPCS 2019 with the earnings that remained from ICALEPCS 2017.

We thank all the sponsors and exhibitors who helped finance the conference. We are especially thankful to our Gold sponsor, Tessella, and Silver sponsors, Beckhoff, and RadiaSoft.

The ISAC chair and committee did a great job advising the LOC during the 2 years leading up to the conference. The PC did an excellent job shaping the scientific program. The editors did an excellent job editing the many abstracts and papers to ensure that the papers were of high quality. The delegates made the conference a success by participating with high quality talks and questions. The folks at the Marriott by the Brooklyn Bridge made a special effort to help make ICALEPCS a success and make the delegates feel welcome. A big thanks to BNL, the host institute, and all the colleagues who helped and provided support for ICALEPCS 2019.

We want to thank our JACoW team; Jan Chrin, Isidre Costa, Kelly Jaje, Maggie Loera, Amy McCausey, Raphael Mueller, Kathleen Riches, Volker RW Schaa, and Toshinari Tanaka.

Finally, we would like to thank (1) the proceedings editor, Philip Dyer, for setting up and maintaining the SPMS and ensuring that the Proceedings were ready on time, and (2) the LOC conference coordinator, Anna Petway, both of whom went far above their normal call of duty, and (3) all the LOC members who worked very hard to ensure ICALEPCS 2019 was a success!

We look forward to seeing everyone in Shanghai in 2021 and in Cape Town in 2023!

The Conference Chairs

Kevin Brown
Richard Farnsworth