

CHEP 2018: Preface to the Proceedings

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Abstract. The 23rd International Conference on Computing in High Energy and Nuclear Physics (CHEP) took place in the National Palace of Culture, Sofia, Bulgaria from 9th to 13th of July 2018. 575 participants joined the plenary and the eight parallel sessions dedicated to: online computing; offline computing; distributed computing; data handling; software development; machine learning and physics analysis; clouds, virtualisation and containers; networks and facilities. The conference hosted 35 plenary presentations, 323 parallel presentations and 188 posters.

1 CHEP conference series

The CHEP conference series was established in 1985 and ever since, CHEP has been one of the most important events in the field of computing in high energy and nuclear physics. The conference covers a broad set of topics such as online, offline and distributed computing; software development, simulation, reconstruction and analysis packages; data handling, data bases and storage solutions; clouds, virtualisation and containers; networking and facilities. It provides a discussion platform between the physicists, computing scientists and IT engineers, as well as between renowned experts and young researchers. The conference is held every 18 months and the host has been selected on “rotational” principle among locations in Europe, the Americas and Asia/Pacific. The conference focuses on the achievements, ongoing activities, plans and trends in the field. The list of past CHEP conferences is shown in Table 1.

Table 1. Past CHEP Conferences

Name	Dates	Location
CHEP’85	25–28 June 1985	Amsterdam, Netherlands
CHEP’87	2–6 February 1987	Asilomar, California, United States

CHEP'89	10–14 April 1989	Oxford, England, United Kingdom
CHEP'90	9–13 April 1990	Santa Fe, New Mexico, United States
CHEP'91	11–15 March 1991	Tsukuba, Japan
CHEP'92	21–25 September 1992	Annecy, France
CHEP'94	21–27 April 1994	San Francisco, California, United States
CHEP'95	18–22 September 1995	Rio de Janeiro, Brazil
CHEP'97	7–11 April 1997	Berlin, Germany
CHEP'98	31 August - 4 September 1998	Chicago, Illinois, United States
CHEP'2000	7–11 February 2000	Padova, Italy
CHEP'01	3–7 September 2001	Beijing, China
CHEP'03	24–28 March 2003	San Diego, California, United States
CHEP'04	27 September - 1 October 2004	Interlaken, Switzerland
CHEP'06	13–17 February 2006	Mumbai, India
CHEP'07	2–7 September 2007	Victoria, British Columbia, Canada
CHEP'09	21–27 March 2009	Prague, Czech Republic
CHEP'10	18–22 October 2010	Taipei, Taiwan
CHEP'12	21–25 May 2012	New York, New York, United States
CHEP'13	14-18 October 2013	Amsterdam, Netherlands
CHEP'15	13-17 April 2015	Okinawa, Japan
CHEP'16	10-14 October 2016	San Francisco, California, United States

1.1 CHEP 2018 Conference

The International Conference on Computing in High Energy and Nuclear Physics (CHEP) took place in the National Palace of Culture, Sofia, Bulgaria from 9th to 13th of July 2018 with 575 participants, including 56 students. The conference was organized by the Institute for Advanced Physical Studies, Sofia University, Plovdiv University, New Bulgarian University, Burgas Free University, INRNE-BAS, ICT-BAS and Sofia Municipality. It was hosted in the National Palace of Culture. The [National Palace of Culture](#) (NDK), in the heart of Sofia, is the largest multifunctional conference and exhibition centre in South-Eastern Europe. It was opened in 1981 in celebration of Bulgaria's 1300th anniversary. NDK hosts over 300 events per year with one million guests. It is decorated with 80 monumental works of art entwined into the halls and foyers.

It occupies an area of 123,000 m² on eight floors and three underground levels. Additional information can be found on the conference Web page chep2018.org.

1.2 CHEP 2018 Program

The program of the CHEP 2018 conference accommodated plenary sessions and 8 parallel tracks. 27 plenary talks were either given by invited speakers or selected and promoted from the abstracts in the different tracks. The main topics of the plenary talks concerned HPC and cloud computing, machine learning in High Energy Physics (HEP), overviews of experiment software for data acquisition, high level triggering, reconstruction and analysis, experience from astro-particle and neutrino physics, as well as broader subjects like multithreading and vectorization in HEP, use of blockchains, quantum computing, software citation mechanisms. Several presentations covered common and widely used tools and packages in HEP such as ROOT, EOS and CVMFS. There was a dedicated presentation on the ways to implement a successful diversity program in the field of HEP and nuclear physics computing. 323 parallel presentations and 188 posters were shown during the 49 parallel and 2 poster sessions. The conference concluded with 8 summary talks from each parallel track, and a forward look to the CHEP 2019 conference in Adelaide, Australia. The subjects and the keywords describing the details of each parallel track are summarised in Table 2.

Table 2. Parallel tracks

	Track	Keywords
1.	Online computing	Data acquisition (DAQ); High Level Triggers (HLT); trigger and trigger-less acquisition; data calibration; online reconstruction; filtering and compression; event building; configuration and access controls; detector control systems.
2.	Offline computing	Event generation; simulation and reconstruction; detector geometries; data classification; visualization and data presentation, outreach.
3.	Distributed computing	Computing models; Grid middleware; monitoring and accounting frameworks; security models and tools; distributed workload; high performance computing (HPC) and supercomputers.
4.	Data handling	Storage management frameworks; data access protocols; object, metadata and event store systems; databases.
5.	Software development	Software frameworks; software management, building, testing, quality assurance and distribution; programming techniques and tools.
6.	Machine learning and physics analysis	Algorithms for physics object identification; machine learning systems and tools; data and analysis preservation.
7.	Clouds, virtualization and containers	Cloud, virtual machines and container technologies; anything-as-a-service; private and commercial clouds.
8.	Networks and facilities	LAN and WAN; overlay, private and virtual networks; monitoring and management tools; computing centre infrastructure, management and monitoring.

The slides of the presentations and the PDF files of the posters are available from the Indico Web pages at <https://indico.cern.ch/event/587955/timetable>.

2 International Advisory Committee

The International Advisory Committee (IAC) of the conference was chaired by the three CHEP2018 co-organisers:

Peter Hristov, CERN;
Petya Vasileva, CERN;
Vassil Vassilev, Princeton.

The chairs of the Program Committee (PC) were elected by the IAC and became ex-officio members of the IAC:

Latchezar Betev, CERN, PC Chair;
Alessandra Forti, University of Manchester, Deputy PC Chair;
Maarten Litmaath, CERN, Deputy PC Chair;
Oxana Smirnova, University of Lund, Deputy PC Chair.

The organizers of CHEP2019 became members of the IAC when Adelaide was selected as the next conference lieu:

Paul Jackson, University of Adelaide;
Waseem Kamleh, University of Adelaide.

Table 3. Members of the International Advisory Committee

Name	Affiliation	Experiment
Alessandra Forti	University of Manchester , UK	ATLAS
Amber Boehnlein	JLAB , Newport News, VA, USA	
Borut Kersevan	University of Ljubljana , Slovenia	ATLAS
Daniele Bonacorsi	University of Bologna /INFN, Italy	CMS
David Groep	NIKHEF , Amsterdam, Netherlands	LHCb
David Malon	ANL , Lemont IL, USA	ATLAS
Elizabeth Sexton-Kennedy	FNAL , Batavia IL, USA	CMS
Federico Carminati	CERN , Geneva, Switzerland	

Gang Chen	IHEP , Beijing, China	RE1
Ghita Rahal	CC-IN2P3 , Villeurbanne, France	ATLAS
Graeme Stewart	CERN , Geneva, Switzerland	
Ian Bird	CERN , Geneva, Switzerland	
Jeff Templon	NIKHEF , Amsterdam, Netherlands	
Jerome Lauret	BNL , Upton NY, USA	STAR
Latchezar Betev	CERN , Geneva, Switzerland	ALICE
Maarten Litmaath	CERN , Geneva, Switzerland	
Marco Cattaneo	CERN , Geneva, Switzerland	LHCb
Maria Girone	CERN , Geneva, Switzerland	CMS
Mohammad Al-Turany	GSI , Darmstadt, Germany	
Niko Neufeld	CERN , Geneva, Switzerland	LHCb
Oxana Smirnova	Lund University , Sweden	ATLAS
Patrick Fuhrmann	DESY , Hamburg, Germany	
Paul Jackson	University of Adelaide , Australia	
Pere Mato Vila	CERN , Geneva, Switzerland	
Peter Clarke	University of Edinburgh , UK	LHCb
Peter Elmer	Princeton University , NJ, USA	CMS
Peter Hristov	CERN , Geneva, Switzerland	ALICE
Petya Vasileva	CERN , Geneva, Switzerland	ATLAS

Predrag Buncic	CERN , Geneva, Switzerland	ALICE
Reda Tafirout	TRIUMF , Vancouver, BC, Canada	ATLAS
Richard Mount	SLAC , Menlo Park, CA, USA	ATLAS
Simon Lin	Academia Sinica , Taipei, Taiwan	
Simone Campana	CERN , Geneva, Switzerland	
Stefan Roiser	CERN , Geneva, Switzerland	LHCb
Takanori Hara	KEK , Tsukuba, Japan	BELLE II
Thomas Kuhr	LMU , Munich, Germany	BELLE II
Thorsten Kollegger	GSI , Darmstadt, Germany	ALICE
Tobias Stockmanns	IKP , Juelich, Germany	PANDA
Tommaso Boccali	INFN , Pisa, Italy	CMS
Tomoaki Nakamura	KEK , Tsukuba, Japan	
Vassil Vassilev	Princeton University , NJ, USA	CMS
Vladimir Korenkov	JINR , Dubna, Russia	
Waseem Kamleh	University of Adelaide , Australia	

The IAC had 25 meetings. It elected the chair and deputy chairs of the Program committee, prepared the long list of the track conveners and elected them as members of the Program Committee. Together with the PC, the IAC defined the list of parallel tracks and approved the associated keywords. The details of the program and the distribution of the time slots were prepared by the PC and discussed by the IAC considering the number of submitted abstracts per track. The IAC proposed the invited speakers of CHEP 2018 and selected the list of plenary talks based on the suggested abstracts. The IAC also voted on the proposals for the next CHEP lieu and selected Adelaide, Australia. CHEP 2019 will take place from the 4th to 8th of November 2019. More information can be found on the conference Web site chep2019.org.

3 Program Committee

The members of the Program Committee (PC) were nominated by the IAC and the final composition was approved seeking gender, geographical, experiment and institutional balance. The PC members were responsible for the selection of abstracts, allocation of oral and poster slots, and served as track conveners during the conference. In addition, they organised the editorial reviews of the CHEP 2018 proceedings.

Table 4. List of conveners per track.

Name	Affiliation	Experiment
Track 1 Online Computing		
Adriana Telesca	CERN , Geneva, Switzerland	ALICE
Catrin Bernius	SLAC , Menlo Park, CA, USA	ATLAS
Clara Gaspar	CERN , Geneva, Switzerland	LHCb
Ryosuke Itoh	KEK , Tsukuba, Japan	BELLE II
Track 2 Offline Computing		
Daniel Elvira	FNAL , Batavia IL, USA	CMS
Gene Van Buren	BNL , Upton NY, USA	STAR
Heather Grey	LBL , Berkeley CA, USA	ATLAS
Lucia Grillo	INFN , Milano-Bicocca, Italy	LHCb
Track 3 Distributed computing		
David Cameron	University of Oslo , Norway	ATLAS
Hannah Short	CERN , Geneva, Switzerland	-
Julia Andreeva	CERN , Geneva, Switzerland	-
Ikuro Ueda	KEK , Tsukuba, Japan	BELLE II

Track 4 Data handling		
Costin Grigoras	CERN , Geneva, Switzerland	ALICE
Elizabeth Gallas	University of Oxford , UK	ATLAS
Maria Arsuaga Rios	CERN , Geneva, Switzerland	-
Tigran Mkrtchyan	DESY , Hamburg, Germany	-
Track 5 Software development		
Barthélémy von Haller	CERN , Geneva, Switzerland	ALICE
Maiken Pedersen	University of Oslo , Norway	ATLAS
Philippe Canal	FNAL , Batavia IL, USA	CMS
Patricia Mendez Lorenzo	CERN , Geneva, Switzerland	-
Track 6 Machine learning and physics analysis		
Andrea Rizzi	INFN , Pisa, Italy	CMS
Michela Paganini	Yale University , New Haven, CT, USA	ATLAS
Sergei Gleyzer	University of Florida , Gainesville, FL, USA	CMS
Sofia Vallecorsa	CERN , Geneva, Switzerland	-
Track 7 Clouds, virtualization and containers		
Andrew McNab	University of Manchester , UK	LHCb
Dave Dykstra	FNAL , Batavia IL, USA	CMS
Fabio Hernandez	CC-IN2P3 , Villeurbanne, France	-
Martin Sevier	University of Melbourne , Australia	BELLE II

Track 8 Networks and facilities		
Oksana Shadura	University of Nebraska , USA	CMS
Pepe Flix	PIC , Barcelona, Spain	CMS
Sang-Un Ahn	KISTI , Daejeon, Korea	-
Wei Yang	SLAC , Menlo Park, CA, USA	ATLAS

4 Local Organizing Committee

The conference chairs are very grateful to the members of the local organising committee, whose precious help made the conference a resounding success: Alexander Penev, PU; Anna Yaneva, SU & CERN; Desislava Nikolova, NDK; Evelina Ananieva, MFA; Elitsa Ivanova; Gancho Dimitrov, CERN; Ivelina Todorova, PU; Martin Vasilev, PU; Milena Veneva, FMI – SU; Stoyan Mishev, IAPS; Todor Ivanov, SU & CERN.

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5 Sponsors

We thank the CHEP 2018 sponsors for crucial contributions to the conference success:

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- T-Systems (www.t-systems.com)



- Silver sponsors

- Intel (www.intel.com)



- Chaos Group (www.chaosgroup.com)



- Bulgarian fund for scientific research,



grant DPMNF01/1 (www.fni.bg)

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