For a fifth consecutive year, the annual symposium of the High-Energy Physics Technology Transfer Network (HEPTech), fostered by CERN, brought together early-stage researchers in high-energy physics and related scientific domains to help them transform their research ideas into marketable innovations. The symposium took place on 11–15 June, and was hosted by the brand-new ELI–ALPS research institute in Szeged, Hungary. Sixteen young researchers from 10 European countries had the chance to meet six experienced professionals, entrepreneurs and technology-transfer experts from the business world to learn how science can impact society.

Along with the traditional topics, such as entrepreneurship in physics, negotiation skills, intellectual-property protection and investor readiness, several new topics were introduced this year. These included the specifics of "open innovation" in a knowledge-based economy and how to conduct research in a scientifically responsible way.

A special session was dedicated to the creation and funding of spin-offs, during which delegates were introduced to the principles of entrepreneurship as well as to grant schemes for financing start-ups and to the importance of the geographical definition of their potential markets.

The story of the creation and growth of Raspberry Pi – an affordable, credit-card-sized computer designed to be used in educational environments – revealed how developments in research were transformed into successful marketable products. The story also addressed issues concerning the development of a commercially sustainable product, such as the role of competition and improvement of the product to meet users' needs.

Topics relating to intellectual property and patent applications triggered lively discussions, with special attention paid to intellectual-property rights in an open-innovation system. The exposure to win–win negotiation techniques allowed delegates to discover their own negotiation styles, and a great challenge for participants was the preparation of five-minute pitches of research projects to attract investors' attention. The last day of the symposium saw the early-stage researchers delivering their pitches before a panel of experts who gave them constructive feedback.

This year's HEPTech-symposium participants qualified their experience as "a high-quality environment for developing business skills", "a perfect place for networking and learning", and "an outstanding opportunity for bridging the gap between science and business".

Eleonora Getsova, HEPTech.

CERN openlab goes to Europe's premier computing event

Maria Girone

From 24 to 28 June, more than 3400 members of the scientific computing community gathered in Frankfurt, Germany, for the annual ISC High Performance conference. The event showcases the latest developments in a host of fields related to high-performance computing (HPC) and features a significant industry show, with more than 150 companies and research organisations exhibiting. It also plays host to the biannual announcement of the "TOP500" list of the world's fastest supercomputers, with Oak Ridge National Laboratory's Summit supercomputer taking this year's top spot following a five-year period of domination by the Chinese machines Tianhe-2 and Sunway TaihuLight.

Maria Girone, CTO of CERN openlab, gave the keynote talk for this year's conference. CERN openlab is a unique public–private partnership between CERN and leading companies such as Intel, Oracle, Siemens and Huawei to make research carried out at CERN and other laboratories possible. Girone's talk, titled "tackling tomorrow's computing challenges today at CERN", discussed the schedule of upgrades for the LHC – which will culminate in the operation of the High-Luminosity LHC (HL-LHC) in around 2026 – and how this will result in a host of new challenges (*CERN Courier* November 2017 p5). Using current software, hardware and analysis techniques, the required computing capacity when the HL-LHC comes online is likely to be roughly 50–100 times higher than today, with data storage expected to enter the exabyte (10^{18} bytes) regime. Girone ended her talk by highlighting a range of specific areas – such as machine learning and data analytics – where collaborative R&D efforts with industry are either already taking place or hold significant future potential, and social-media posts about the talk reached an audience of more than 100,000.

Members of CERN openlab's management team, which is led by Alberto Di Meglio, held meetings with a range of existing and potential partner companies, including D-Wave, Google and Cray. The event also saw Sofia Vallecorsa of the CERN IT department awarded the prize for best research poster in the category "programming models and systems software". Her poster presented work carried out through a CERN openlab project with Intel to explore the feasibility of using deep-learning algorithms for the simulation of particle transport in the
LHC experiments.

Andrew Purcell, CERN.

PhD training programme for southeastern European students

BS2018 School

Since its foundation in 2003, the Southeastern European Network in Mathematical and Theoretical Physics (SEENET-MTP) has organised scientific training and research activities in the Balkan and neighbouring regions. The fifth and "closing" school of the first cycle of one such activity, High Energy and Particle Physics: Theory and Phenomenology – BS2018, was held in Niš, Serbia on 3–9 June.

In 2015, CERN and SEENET-MTP launched a joint PhD training programme aimed at students from southeastern European countries (*CERN Courier* April 2018 p52). The main part of the programme consisted of a series of one-week schools for PhD and advanced MSc students in high-energy physics, and in 2017 the programme became part of a general agreement of cooperation between CERN and SEENET-MTP.

At BS2018, Sergey Sibiryakov (CERN) gave an introduction to cosmic-structure formation and Kyriakos Papadodimas (CERN) introduced the AdS/CFT correspondence and black holes. Paolo Creminelli (ICTP) taught cosmology and inflation, and Lasha Berezhiani (LMU/MPI) gave an introduction to supersymmetry. The organisers owe a special gratitude to Emilian Dudas (CPHT), who agreed to cover the Standard Model course and gave a brief introduction to string phenomenology, and also to Ignatios Antoniadis (AEC/LPTHE), who completed the latter course. Alexei Starobinsky (Landau Institute) was a special guest lecturer and gave the closing lecture on inflation and its present status.

Around 40 students from 10 countries attended the school and each had the opportunity to present their work through oral and poster sessions. The school was followed by the seventh edition of the Balkan Workshop, BW2018 – Field Theory and the Early Universe, on June 10–14, which was attended by 51 scientists from 15 countries and comprised around 30 lectures.

The EPS and SEENET-MTP jointly marked their anniversaries: 50 years of the EPS (for the SEE region) and 15 years of the network.

The next cycle of the joint PhD training programme is expected to start in Ioannina in Greece in the spring of 2019.

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