

Three teams of high-school students win the Beamline for Schools competition

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At the end of June the winners of the 10th edition of the Beamline for Schools (BL4S) competition were announced: the team "Myriad Magnets" from the Philips Exeter Academy, in the USA, the team "Particular Perspective" from Pakistan, consisting of pupils from five schools (the Islamabad College for Boys, the Supernova School in Islamabad, the Cadet College in Hasanabdal, the Siddeeq Public School in Rawalpindi and the Cedar College in Karachin) and the team "Wire Wizards", from the Augustinianum school in Eindhoven, The Netherlands. The first two teams will be hosted by CERN in September 2023 to perform the experiments they proposed, while the third will go to the DESY Laboratory in Hamburg to perform its experiment.

BL4S is a competition open to high-school students from all around the world. They are invited to propose a physics experiment that can be carried out using a particle beam at an accelerator. The competition's web site provides a wealth of information about the beamline, the equipment at their disposal for their experiment as well as examples of possible experiments. The participating teams, under the guidance of an adult coach (in most cases a high-school teacher or a researcher) prepare and submit a document describing the experiment they propose accompanied by a short video. An evaluation committee does a first preselection and then experienced physicists and engineers of CERN and DESY select the winners, who are invited to CERN or DESY to perform their experiment, with the help of physicists dedicated to the project.

The BL4S competition was launched in 2014 on the occasion of CERN's 60th anniversary. Given the success of this first edition, the competition continued and reached the 10th edition this year. In 2019, 2020 and 2021, during the long shutdown of the CERN accelerators, DESY stepped in providing a beamline and since then the collaboration between CERN and DESY has been continuing. More than 16 000 pupils from all over the world have participated since 2014, the number of proposals has been increasing and this year, the record number of 379 proposals were submitted from 63 countries.

"We are very happy that one third of the participants of BL4S are girls. This shows that excellence in science is independent of gender", says Markus Joos, BL4S technical coordinator.

"I am always amazed to see what students can do when they are properly coached and motivated. Beamline for Schools is a very interesting educational opportunity for students who are about to choose where to direct their careers", says Margherita Boselli, programme manager of BL4S.

This year's winning proposals cover a wide spectrum. The Myriad Magnets team will build and test a magnet with the Halbach geometry that can produce a dipole or quadrupole magnetic field. The Particular Perspective team will study the beam composition of the T10 beamline at the CERN Proton Synchrotron, and the Dutch team will build a multiwire proportional chamber (MWPC) and study its performance at the electron beam provided by DESY.

Even though the probability of winning is low, given the high number of proposals, the students profit from their participation. They acquire knowledge while researching in a field that they are probably not familiar with, they learn to work in a group, sometimes collaborating with students from different schools or even different countries. *"BL4S provides high school students the opportunity to apply their theoretical knowledge about modern physics in a practical way. In working on their proposals they get a deeper understanding of the microcosm. This often motivates them to study physics or a STEM subject once they enter university"*, adds Markus Joos.



Despina Hatzifotiadou - Senior researcher at the Italian National Institute for Nuclear Physics (INFN), Unit of Bologna, she is member of ALICE, the heavy ion experiment at LHC where she contributed in the design and construction of the Time of Flight array, based on Multigap Resistive Plate Chambers. She is the outreach coordinator of ALICE and represents it in IPPOG. She is also involved in the Extreme Energy Events (EEE) project, which studies extensive showers of cosmic rays.