

# CERN: Updates for students and educators

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**03/04/16--06:14: UK launches Institute for Research in Schools** 0  0

[James Gillies](#)



Dr Becky Parker speaking at the launch of the UK's new Institute for Research in Schools. (Image: Matt McCardle)

Every year, Becky Parker, Director of the Institute for Research in Schools (IRIS) and former Head of Physics at the Simon Langton Boys' Grammar School in the southern English town of Canterbury, brings groups of young men and women to CERN as part of the school's approach of involving its more senior students in research. Over recent years, Dr Parker's initiative has blossomed in many ways, with students developing compact

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environmental radiation detectors based on the CERN-developed Medipix chip, deploying a cosmic ray detector network and even building detectors that are currently monitoring astronaut Tim Peake's radiation levels on board the International Space Station. The whole project runs under the banner of [CERN@school](#), and is supported by the UK's Science and Technology Facilities Council, [STFC](#), the [Institute of Physics and SEPnet](#). Students have had the opportunity to work with research teams from companies like Rolls-Royce and Surrey Satellite Technology, and organizations including NASA and ESA - as well of course as CERN, where the school is now part of the [MoEDAL](#) collaboration. The impact has been profound. Although a school for boys, young women are admitted for the final two years, and typically around 1% of all women embarking on physics degrees in the UK come from the Simon Langton every year.

Impressed with Dr Parker's boundless energy and contagious enthusiasm, CERN invited her to give a talk at [TEDxCERN](#) in 2013, hopeful that it would inspire similar initiatives elsewhere. That hope was not unfounded, as Dr Parker explains.

*"The reaction we got to my TEDxCERN talk was phenomenal," she explains, "and it was an important step to where we are today. Without CERN, it's fair to say that the Institute for Research in Schools would not exist."*

The Institute for Research in Schools provides opportunities and support for school students and their teachers to take part in authentic research in school. It is a charitable trust developing a range of research fields within which schools develop their own research projects. Among the Institute's key aims are nurturing the potential and ability of young people to contribute to the scientific community, increasing the uptake of post 16 maths, science and technology courses, increasing applications for STEM subjects at university, especially among girls, enhancing teachers' expertise and job satisfaction in order to retain teachers and recruit more to the profession, and engaging Universities and Industry in sustained interaction with schools. As well as the [CERN@school](#) initiative, which already involves over 50 schools, the Institute also promotes research areas in the biomedical arena with the support of the Wellcome Trust.

[CERN@school](#) shows that you are never too young to contribute to science. And through the Simon Langton's success at providing young people to study STEM subjects at University, it is a clear example of the power of CERN science to inspire the upcoming generation of scientists and citizens.

For more information, visit the [Institute's web site](#).

➔ **03/24/16--00:23: Applications for S'Cool LAB now open** 0  0   

[Alex Brown](#)



Students working in CERN's S'Cool LAB (Image: Jeff Wiener/ CERN)

[Applications](#) are now open for high school physics teachers interested in having their students take part in S'Cool LAB days at CERN between September 2016 and January 2017. S'Cool LAB is CERN's new hands-on particle physics learning laboratory, offering a unique full-day programme of experimental workshops and CERN site visits for high schools students and their teachers from all around the world. Whether it be by building their own cosmic particle detectors, diagnosing a X-ray image or working out the Lorentz force with magnet in hand, students can get to grips with fundamental research and see CERN science for themselves. The deadline for applications is 25 April 2016.

Further information about S'Cool LAB days at CERN is available [here](#), and the application form is [here](#).

➔ **03/29/16--00:29: Geneva Summer Schools** 0 0

[The Geneva Summer Schools Team](#)

Applications are now open for registration for all the

## 2016 [Geneva Summer Schools!](#)

Academic lectures will be combined with visits, round tables and debates in connection with experts of leading Geneva-based International Organisations, as well as top global non-profit institutions and companies. Participants will get the opportunity to experience Geneva's dynamic, multicultural and international environment. They will be exposed to world-class expertise with unique networking opportunities.

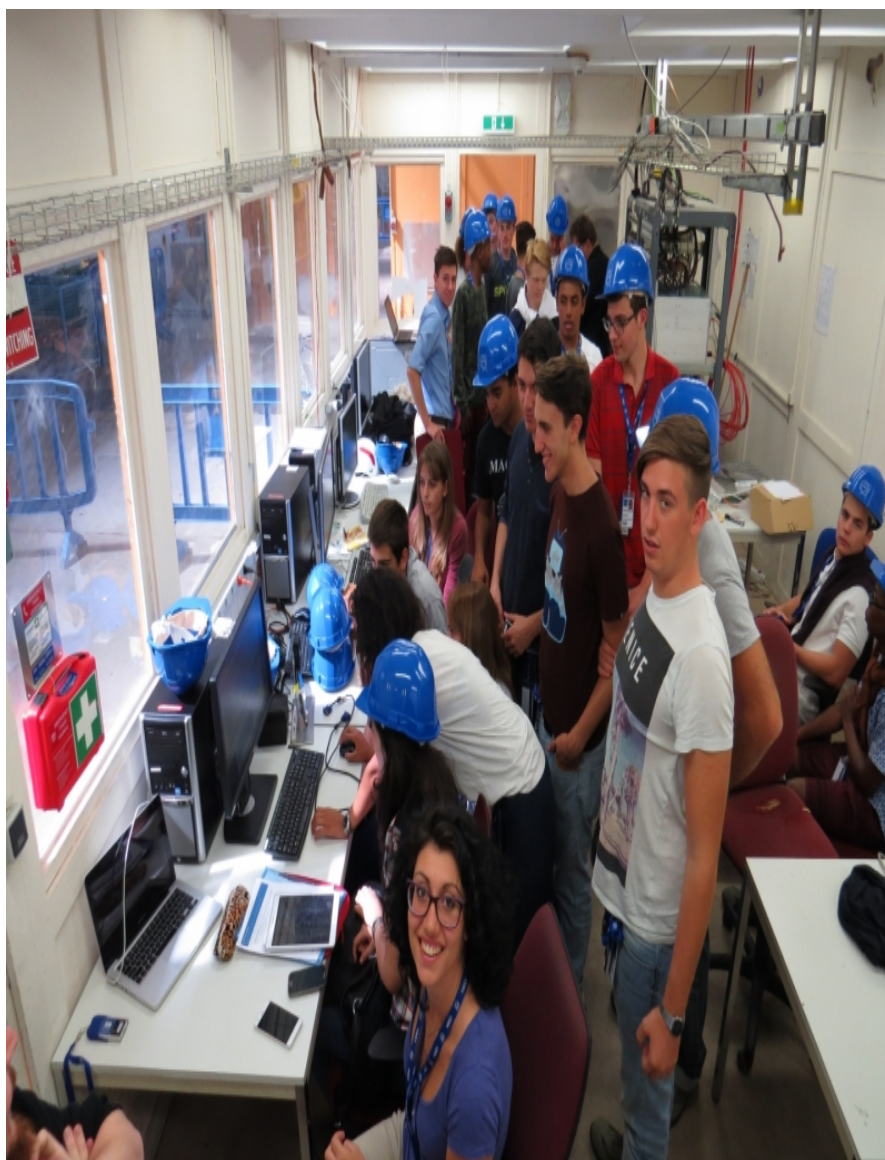
As for previous years, the course materials and lectures are in English and ECTS credits points may be granted by the student's home university (at its discretion). Final application deadline is on May 1st, 2016.

Please visit us on [our website](#) and on [our Facebook page](#). You're welcome to subscribe to [our newsletter](#).

▶ **04/28/16--00:22: [Inventive ideas bring schools step closer to beamline](#)**



[Markus Joos](#)



Students from the Beamline for Schools competition in 2015 look at data from their experiments (Image: Markus Joos/CERN)

Recently 151 teams submitted fantastic proposals for the 2016 [Beamline for Schools](#) Competition. Early evaluation shows huge originality and novelty in the applications, leading to new prizes being created.

Selection of the winners is now underway for the competitions, which will give two teams of high-school students the chance to perform an experiment at a fully functional beam line at CERN.

This year, teams from all over the world sent written proposals, and short videos with a huge range of ideas for how they could use the beamline.

The inventiveness of each proposal, which vary wildly from team to team is often a testament to the coaching given by their fantastic physics teachers.

This year proposals ranged from using CERNs beam to test particle accelerators they've built at school, to physics experiments testing the theory of relativity, to experiments that lead to Nobel prizes just three generations ago. The inspiration for the teams came from a huge range of ideas, such as the potential applications of particle physics in health treatment, as well as testing shielding materials that will protect astronauts on a journey to Mars.

The proposals are being analysed from now by teams of enthusiastic volunteers, CERN scientists and external specialists, and already the [enthusiasm](#) and creativity of this year's entries is evident:

*"[We want to come to CERN] because it is a place where people meet, cooperate and engage beyond their nationality and their own cultural patterns contributing to the development and to the wellness of society"* **Team Peano**

*"We love physics and we are sure we will leave a mark on history, we are the change we want to see in the world."*  
**Team Ravens**

*"Designing an experiment that discovers new knowledge or confirms the old is the most incredible opportunity we've yet encountered."* **The 5 Sigma project**

*"We have to know who we are, our strengths, our weaknesses, our limits and it is projects like Beamline for Schools that help us do precisely this."*

*This project made us get out of our comfort zone, open our minds, it also made us realise how little we actually know and therefore, it made us curious to learn more about particle physics, a branch we know very little of even now."*  
**30(ns)toBang**

To reward more teams for their effort and excellent work, additional prizes will now be awarded. 30 teams will receive one [CosmicPi](#) particle detector for their school as well as BL4S t-shirts for all team members. The two main winning teams will be also invited to carry out their experiments at CERN in September. All winners will be notified in June.

These prizes are thanks to the support from the Alcoa Foundation, with

additional contributions from the Motorola Solutions Foundation, the Ernest Solvay Fund managed by the King Baudouin Foundation, as well as National Instruments.

➔ **06/13/16--07:04: Winners of 2016 Beamline for Schools competition announced**

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The students undergoing training on the beam line as part of the 2015 competition, the 2016 competition winners will undergo similar training before they start their experiments (Image: Guillaume Jeanneret/CERN)

Sixteen students have won the chance to get behind the wheel of a CERN accelerator beam, to conduct their own experiments. The students are from two teams announced today as winners of CERN's 2016 [Beamline for Schools competition](#).

Two teams of high-school students, Pyramid Hunters from Poland, and Relatively Special from the United Kingdom, have been selected to travel to CERN in September to carry out their own experiments using a CERN accelerator beam. The winners were selected from a total of 151 teams from 37 countries around the world, adding up to more than 1250 high-school students.

The Beamline for Schools competition enables high-school students to run

an experiment on a fully equipped CERN beamline, in the same way that researchers do at the Large Hadron Collider and other CERN facilities. [Students were asked to submit a written proposal and video](#) explaining why they wanted to come to CERN, what they hoped to take away from the experience and initial thoughts of how they would use the particle beam for their experiment. CERN scientists and experts evaluated the proposals based on creativity, motivation, feasibility and scientific method. A final selection was put forward to the CERN scientific committee responsible for assigning beam time to experiments, who chose two winning teams to carry out their experiments together at CERN.

*"I am impressed with the level of interest within high schools all over Europe and beyond, as well as with the quality of the proposals. This competition is very effective in triggering motivation for fundamental physics of young brilliant students at a moment that is crucial for their future career choices",* said Claude Vallee, chairperson of the CERN SPSC committee that chose the winning teams

Pyramid Hunters are seven students from Liceum Ogólnokształcące im. Marsz. St. Małachowskiego, the oldest school in Poland. Their project involves measuring the muon absorption of limestone to help understand data from a muon tomography of the Chephren pyramid from many years ago.

*"I can't imagine better way of learning physics than doing research in the largest particle physics laboratory in the world. I still can't believe it,"* says student Kamil Szymczak. Classmate Kamil Krakowski adds: *"It is fascinating how physics connects with archaeology. I am so glad that research taken in CERN can help to solve the mystery of pyramids. It is a wonderful adventure."*

"Relatively Special" is a team from Colchester Royal Grammar School and comprises 17 students, nine of which will travel to CERN. Their project aims to test the validity of the Lorentz factor by measuring the effect of time dilation due to Special Relativity on the decay rate of pions.

*"My mum asked me "What is your team doing in the competition?" and I replied "Oh, just proving Einstein's Special Theory of Relativity,"* laughs student Achintya Singh.

The first Beamline for Schools competition was launched to coincide with CERN's 60th anniversary two years ago. To date, winners from the Netherlands, Greece, Italy and South Africa have performed their experiments at CERN. This year, short-listed teams each receive a Cosmic-Pi detector for their school that will allow them to detect cosmic-ray particles coming from outer space.

*"We are very happy to be able to offer this experience to high-school students, thanks to support received via donations to the CERN & Society Foundation,"* said Markus Joos, Beamline for School project leader.

➔ **06/20/16--06:38: Applications for S'Cool LAB days in 2017 now open**

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Students at the S'Cool Lab viewing cloud chambers (Image: Jeff Wiener/CERN)

High school teachers are invited apply online now to visit [S'Cool LAB](#) between February and June 2017 for a full-day programme of hands-on, experimental workshops and guided tours.

[S'Cool LAB](#) is an international, particle physics learning laboratory for high-school students aiming to make CERN's scientific programme and technologies understandable through experimentation.

High school teachers interested in bringing students aged sixteen and up to CERN, are invited apply online now. For complete information about S'Cool LAB days at CERN and the application process, [click here to visit the S'Cool LAB website](#).

The deadline for applications is 14:00 CEST on Monday, 27 June 2016.

➤ **06/21/16--02:17: [Bringing CMS to South Korea](#)**

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[Achintya Rao](#)





Prof. Un-Ki Yang, CMS senior scientist from South Korea, welcomed students to the CMS virtual visit (Image: Choi Youngjae/CERN)

Recently, a group of university students from South Korea got the chance to experience the CMS experimental cavern remotely, through the wonder of [a virtual visit](#).

A technical stop, which gave on-site personnel the opportunity to perform maintenance on the Large Hadron Collider (LHC) and the CMS detector, provided a unique chance for students from Hanyang University, Seoul, to gain remote access to it too.

The visit, guided by Dr. Junghwan Goh from Hanyang University, Seoul, was special as Hanyang University joined the CMS Collaboration six months ago, and their representatives wanted to introduce their students, including some undergraduates interested in high-energy physics, to the international collaboration their institute is now a part of.

CMS virtual visits have been formally conducted for nearly two years, connecting schools, universities and science festivals across the globe with researchers at the CMS experimental site just outside Cessy, France. The virtual visits enable people from just about anywhere to engage in face-to-face dialogue with CMS representatives via video conference to learn about the collaboration's research and ask questions directly to the scientists.

While the LHC is operational, the underground tour is restricted to the service cavern, which contains the computing and monitoring racks. But, during a technical stop and with the applicable safety precautions in place, the CMS guides can take the virtual visitors up close to the CMS detector

itself.

"Since I am majoring in a completely different field of physics – condensed matter physics – I had been looking forward to this opportunity to learn more about the very forefront of modern physics," said Gyujin Oh, a doctoral student at Hanyang University.

Seong-Pil Moon, a Masters' student in the Department of Physics added, "when the guide said the muon detector is made, in part, in Korea, I felt very proud. The one hour seemed very short, but was very impressive. I learnt how physicists around the world collaborate and hope to be part of such an international effort myself."

"CMS Virtual Visits continue to foster engagement between members of the collaboration and interested members of the public, especially students, and we look forward to bringing more visitors to Point 5 through these video conferences," said Virtual Visits organiser Marzena Lapka from the CMS Communications Group.

➔ **06/21/16--09:06: Innovation for Change rewards student water leak solution**



AquaSmart, a smart grid system to help identify and solve water leakages, was announced as the winner of the Innovation for Change project (Image: Innovation for Change)OK. „k o ,

Yesterday AquaSmart, a smart grid system to help identify and solve water leakages, was announced as the winner of the Innovation for Change project. Innovation for Change, which [began at CERN in February](#), rewarded the business ideas developed by 50 MBA students of the Scuola di Alta Formazione al Management (SAFM, a business education programme based in Turin) and graduate students of the Polytechnic of Turin.

The ideas had to be based on credible innovative solutions, using available technologies to address global collective needs so that real startups could be borne into the market.

The prototypes and technical solutions were presented and evaluated on 20 June at the Castello delValentino in Turin by four special judges: Vice President of the Agnelli Foundation, John Elkann; the Director General of CERN, Fabiola Gianotti; the Rector of the Polytechnic of Turin, Marco Gilli and the President of SAFM Francesco Profumo.

Other ideas included: automatic sensors that release the right amount of fertilizer in agricultural fields, reducing the impact on aquifers; even a floating greenhouse shaped like a whale that uses solar energy to desalinate sea water and irrigate crops, bringing water to where it is scarce; and solutions for urban construction using algae to purify water, reducing fuel consumption.

After working through the solutions developed by the students, the judges awarded AquaSmart the best business idea. They will receive a special contribution of 50,000 euros, allocated by the Agnelli Foundation as part of the celebrations marking 50 years of operation. The contribution is intended to support the Working Group of AquaSmart to constitute a real startup and start operating on the market.

Besides AquaSmart, the judges also selected Demetra, an automatized agricultural resource management system and Alfie, a vertical algae wall concept for water recycling in urban cities.

The three working groups will be awarded the opportunity to participate for free at the European Innovation Academy (EIA), the international acceleration programme for technology startups, that will be hosted by the Polytechnic of Turin from 10 to 29 July in cooperation with partner companies and will bring to Turin mentors from Silicon Valley and 300 talented students from the best universities around the world.

The programme is a collaboration between CERN, the Italian Ministry of Economic Development, the United Nations Development Programme, Barilla, ENEL, Smat and other Italian and international organisations.

📌 **07/01/16--07:23: [Winning Intel ISEF students come to CERN](#)**

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[Andrew Purcell](#)



From 11 to 17 June, CERN hosted the 10 young students who won [the CERN Special Award](#) at [the Intel International Science and Engineering Fair \(ISEF\) 2016](#). These winners were selected from the 1700 high-school students who participated in the competition.

The competition, which is a programme of [the Society for Science and the Public](#), is the world's largest pre-university science competition. It offers high school students from across the globe a chance to showcase their research into a range of fields.

The winners of the CERN Special Award were selected by Maria Girone and Jan Iven of CERN IT Department and Ian Fisk of Simons Foundation at an Intel ISEF event held in Phoenix, Arizona, US, on 17 May.

The CERN Special Award — funded jointly by Intel and the CERN IT Department — is now in its eighth year. [The winning students](#)— aged between 15 and 18 — spoke to researchers at the laboratory and had the opportunity to see exciting technology up close. Sites visited include the [AMS experiment](#), the [Data Centre](#), the [LEIR accelerator](#), the [Synchrocyclotron](#), the [CERN Control Centre](#), and the [Antiproton Decelerator](#). The students also visited several cultural hotspots in the local area, such as Gruyères and Chillon Castle near Montreux.

Sophie Atzpodien, 16, says that what she liked most about the visit was learning about all of the different aspects of the laboratory and how these contribute to fundamental research. “It was an invaluable experience,” she says. “I’d love to return to learn more.”

“The week has changed my outlook on a career in physics,” says Michael Earle, 18. “It all seems so real, so accessible to a student.” Amber Yang,

17, agrees: "It's been an amazing experience; I'm leaving CERN with a completely new perspective on life."

During their time at CERN, the students presented five-minute 'lightning talks' on their projects. These focused on areas from IT to materials science and from robotics to astrophysics. The presentations are available via the event's [Indico page](#).

"The visit is a great experience for us here at CERN too," says Girone, CTO of CERN **openlab**, who co-organised the event with other members of the IT Department. "It's a joy to see these passionate young students come here, absorb lots of new information and ask us tough questions."

➔ **07/19/16--03:33: [Take part in the 2017 Beamline for Schools competition!](#)**



[Markus Joos](#)



The winners of the 2015 Beamline for schools competition participating on a safety training course before performing their experiment at CERN in

2015.

CERN is pleased to announce the fourth annual [Beamline for Schools \(BL4S\) Competition](#). Once again, in 2017, a fully equipped beamline will be made available at CERN for students. As in previous years, two teams will be invited to the Laboratory to execute the experiments they proposed in their applications. The 2017 competition is being made possible thanks to support from the Alcoa Foundation for the second consecutive year.

The [competition](#) is open to teams of high-school students aged 16 or older who, if they win, are invited (with two supervisors) to CERN to carry out their experiment. Teams must have at least five students but there is no upper limit to a team's size (although just nine students per winning team will be invited to CERN). Teams may be composed of pupils from a single school, or from a number of schools working together.

As science-loving mega-celebrity Will.I.Am told us: "If you're interested in science, technology, engineering or mathematics you should sign up: if I was a kid I'd do the same thing."

Previous winners have tested webcams and classroom-grown crystals in the beamline, others have studied how particles decay and investigated high-energy gamma rays. What would you do? Interested? Think of a simple, creative experiment and [pre-register](#) your team in order to receive the latest information about the competition and to hear when the proposal submissions open.

Not sure if you should apply? Don't be scared: a clever idea is all it takes to enter the competition. We can put every team in contact with experts who will help them to refine their ideas, and extensive documentation is available to both teachers and students.

Don't miss this unique opportunity! BL4S does more than just give high school students a chance to play with real, functioning scientific equipment: it exposes a host of students and teachers to particle physics and gives them the chance to be real scientists.

You can find out more about how to apply, about the beamline and facilities, and about previous winning teams on the [BL4S website](#). The deadline for submissions is 31 March 2017.

[Take part!](#)