

Secondary schools



**HiSPARC:** enquiry based project for High Schools, a project of  
The Institute for Research in Schools <http://www.researchinschools.org/>

*An opportunity to involve students in real research*



The project is a study of high energy cosmic rays as detected by a particle detector installed in the school. The detector is provided by the HiSPARC collaboration and arrives as a DIY kit that is assembled and placed on the school's roof, with advice and help from the HiSPARC collaborators and researchers here on campus. Students, guided by the University staff and their teachers, access the cosmic ray data using a computer and learn how to statistically analyse in order to discover patterns and answer long standing questions on cosmic rays.

To find out more please visit:

<http://www.birmingham.ac.uk/schools/physics/outreach/Secondary-Schools/HiSPARCproject.aspx>



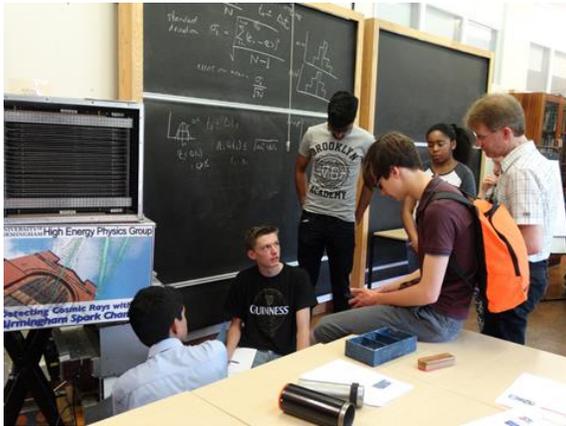


# Physics Experience Week

for students in year 10 and year 11; a selection process applies

**Applications deadline: 31 December 2019**

**Event runs: 22-26 June 2020**



**“It has encouraged me to want to continue Physics in the future and incorporate it into my career.”**

**“I enjoyed Thinking like a Theorist and Scientific communications. I also enjoyed the lecture about nuclear reactions.”**



*For more information please visit:*  
<http://www.birmingham.ac.uk/schools/physics/outreach/Secondary-Schools/physics-experience-week.aspx>



UNIVERSITY OF  
BIRMINGHAM

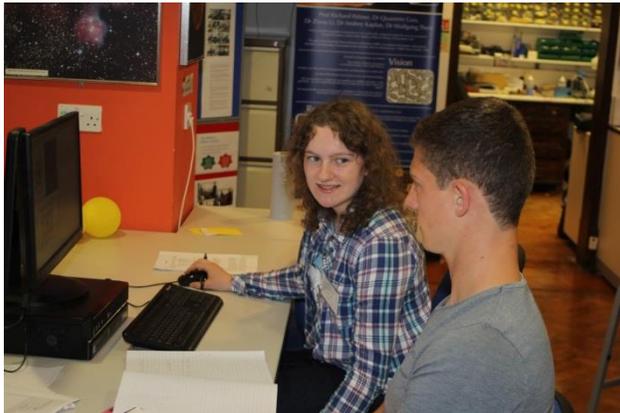
SCHOOL OF PHYSICS  
AND ASTRONOMY

# Residential Physics Summer School

for students in year 12 studying physics and maths (no selection process)

*Applications deadline: 18 May 2020*

*Event runs: 1-2 July 2020*



**“Thank you for a brilliant two days at the Physics Summer School! It was really interesting and I met some great people.”**



- Team challenge activities
- Lectures and workshops
- Rocket Challenge
- Out in the City
- Hands on Lab work in the undergraduate laboratories

***For more information please visit:***  
<http://www.birmingham.ac.uk/schools/physics/outreach/Secondary-Schools/summer-schools.aspx>



# SKYPE links to your classroom

Bring a researcher into your classroom to talk to your students about the research they do, and to answer questions related to the topic they are studying as part of the A Level or GCSE curriculum in the classroom. This is a new initiative to enhance your lessons and illustrate in a real way “how science works”.

We have a number of researchers you can contact directly by e-mail to arrange a SKYPE link of 15 – 20 minutes. Your students should be studying a relevant topic and have their questions prepared in advance of the link. Once the link is made, the researcher will introduce themselves and say a little bit about their work. Then the students will have an opportunity to ask their questions.

Please talk in advance to your school IT technicians and get advice about setting up a link, then e-mail the researcher to set up a time and date.

For more details please visit

<http://www.birmingham.ac.uk/schools/physics/outreach/Secondary-Schools/ask-a-researcher.aspx>



[Dr Tzany  
Kokalova  
Wheldon](#)



[Prof Cristina  
Lazzeroni](#)



[Prof Ilya  
Mandel](#)



[Prof  
Andreas  
Freise](#)



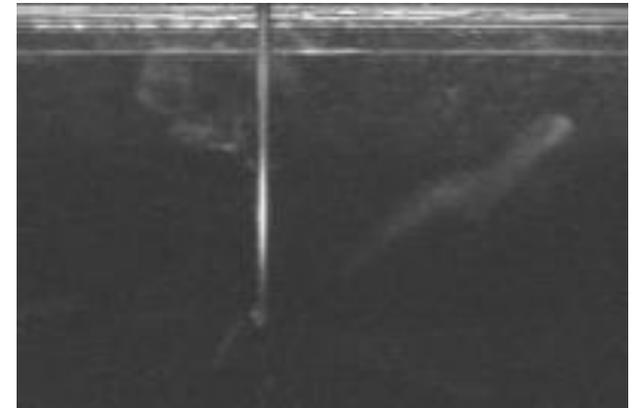
# Cloud chambers for schools

Cloud chambers based on a simple, but effective, design, have been built by members of the [Elementary Particle Physics Group](#) at the [University of Birmingham](#), and are available for demonstrations at schools. A cloud chamber can be loaned for up to two weeks at a time, for a nominal hire cost of £10.00 per week (longer hires are more expensive).

Full details, and general suggestions for experiments and measurements linked to the school curriculum, are given in the [Cloud-Chamber Manual](#).

Teachers may also ask for a researcher from the [Elementary Particle Physics Group](#) to come to their school to give a demonstration of the cloud chamber, and answer questions from students.

For more details about the loan scheme, or to request a demonstration, please contact Prof Cristina Lazzeroni ([cl@hep.ph.bham.ac.uk](mailto:cl@hep.ph.bham.ac.uk)).





# Cosmic Ray Telescopes for schools

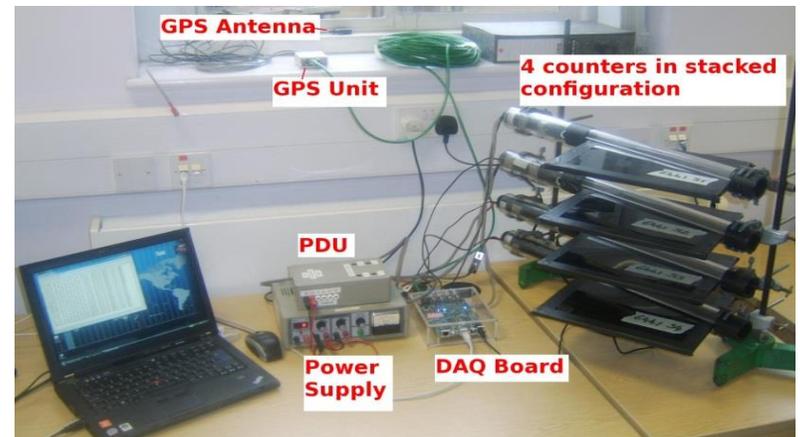
The Birmingham QuarkNet Project in Schools: At the University of Birmingham, we currently have several cosmic ray telescopes which we would like to loan to schools so that they can run a QuarkNet project.

Along with the detectors we will also provide worksheets which have been written by the University of Birmingham. These will provide full details of how to use the detector and will take students through all the different experiments they can carry out.

For more information about the Birmingham QuarkNet project, please contact Dr John Wilson ( [jaw@hep.ph.bham.ac.uk](mailto:jaw@hep.ph.bham.ac.uk) )

For more information on equipment loan please visit:

<http://www.ep.ph.bham.ac.uk/twiki/bin/view/General/QuarkNet>



Primary schools



# Clocks and Gears Workshop

A workshop explaining:

- how clocks worked through the ages; from sundials and hour-glasses to ancient Greek water clocks that used gears
- the mathematics and science of interlocking gears



Hands-on activities:

- making a wind-up clock with fifteen gear wheels
- discovering the scientific pattern between the length of the clock's pendulum and the time of its swing



# Particle Physics Workshop

A workshop explaining:

- How particle physicists discover the constituents of matter through particle collisions
- The families of particles in the standard model
- How particles interact with one another



Hands-on activities:

- making a model of a subatomic particle using simple materials e.g. plastic balls, plasticine, decorations
- Creating an artistic piece (poetry, music, dance, drama etc.) from a particle interaction diagram