



# SEPnet OUTREACH

Exciting Physics activities on campus and in school



South East Physics Network **Outreach**



## WHAT IS SEPnet?

SEPnet (the South East Physics Network) is a consortium of university physics departments around the South East of England, working together to promote physics and physics qualifications. Each partner university has an outreach team with dedicated physics and physical science activities for delivery on campus and in school.

We provide regional programmes, offered from all our sites, as well as a range of different activities provided by the individual departments.

For more information about our programmes, please visit our website [www.sepnet.ac.uk](http://www.sepnet.ac.uk) or contact your local SEPnet outreach officer.

# GCSE PROGRAMME



The SEPnet GCSE Programme is a series of free activities designed to support the teaching of physics, including modules in core and additional science, at GCSE. The programme includes:

- **GCSE Taster Session**  
A half day activity on a university campus, designed for students who will soon start, or have just begun, their GCSEs. The session includes a short lecture, an exhibition of hands-on activities and a quiz, based around energy and energy resources.
- **Workshops in school**  
Short (1-2 hour) workshops are available in a range of topics relating to the GCSE syllabus. Each school may participate in two workshops a year.

# CERN@school



© Maximilien Brice, CERN

This research project sees school pupils working with the latest technology from CERN to analyse cosmic radiation. Each SEPnet partner is supporting a CERN@school

cosmic ray detector that uses a chip developed at CERN to measure the position and energy of single photons hitting an associated detector. The detectors also pick up alpha, beta and gamma radiation, making them invaluable in the classroom.

To request a CERN@school detector for your school, please contact your nearest SEPnet partner.

# PHYSICS IN SPORT COMPETITIONS



In 2012, each SEPnet partner developed a one day hands-on challenge for teams of KS5 students, based on an Olympic sport.

These competitions are run annually and may also be available on request. Contact your nearest SEPnet partner to learn more.

Resources for running adapted activities in schools, including videos and worksheets are available on the National STEM Library.



# SEPNET MOBILE PLANETARIUMS



© Dr Darren Baskill, University of Sussex

The Universities of Kent, Sussex and Southampton host mobile planetariums that we use on campus and take out to schools.

There are a variety of different shows available, so please contact us or look at the individual websites for more information.

# REGIONAL WORKSHOPS



We have a selection of workshops available from all our institutions:

- In our **LightTAG workshop**, KS3 students will learn about the physics of light and photography, and will have the opportunity to create their own light drawing images.
- **Accelerate!** is an exciting, live-action lecture all about particle physics designed for 11–18 year-olds and the general public. Through a series of hands-on demonstrations, you'll learn how to drive a particle accelerator. It is delivered by all the SEPnet partners and resources can be found here: [www2.physics.ox.ac.uk/accelerate/resources](http://www2.physics.ox.ac.uk/accelerate/resources)
- Our **LEGO workshops** demonstrate key principles in fission and fusion (for KS4 audiences) and particle physics (for KS5 audiences), focussing on curriculum relevant areas and using LEGO to introduce a hands-on element to these topics.  
  
Resources for these workshops can be found here: [ph.qmul.ac.uk/engagement/physics-kits](http://ph.qmul.ac.uk/engagement/physics-kits)

# UNIVERSITY OF KENT

Canterbury, Kent, CT2 7NZ

[www.kent.ac.uk/physical-sciences/outreach.html](http://www.kent.ac.uk/physical-sciences/outreach.html)

University of  
**Kent**

The School of Physical Sciences at the University of Kent has an extensive outreach programme which has contacts with around 18,000 people per year enthusing and inspiring students and the general public to further their knowledge of physics and forensic science. Highlights include:

- A **cryogenics display/talk** – looking into the world of low temperature physics. This is a fun display using dry ice and liquid nitrogen to look at concepts such as expansion and contraction, change of state, superconductivity, boiling points, and material characteristics at low temperatures. It is aimed at inspiring key stage 3 students.
- **Rocket days** – which includes a rocketry talk, and either launching a pre-made rocket or building and launching chemical rockets.
- **Space School** – a residential weekend full of space science and astronomy. Students spend the weekend having lectures from leading space scientists and astronomers, build and launch rockets along with other activities such as designing a space colony and observing with the University telescopes.
- **Lectures from academics** – on topical research subjects such as nanotechnology, structural studies using x-rays and neutrons, life in space and new innovative uses of glass.

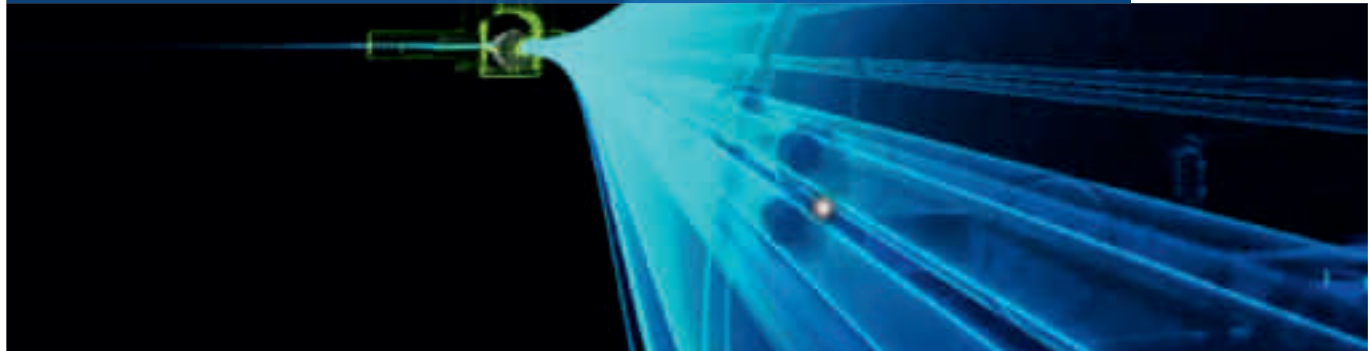


# UNIVERSITY OF OXFORD

Clarendon Laboratory, Parks Road, Oxford, OX1 3PU  
[www2.physics.ox.ac.uk/about-us/outreach](http://www2.physics.ox.ac.uk/about-us/outreach)



© CERN



Oxford Physics endeavours to stimulate interest and learning in physics by sharing our exciting research with schools and the public. We work in collaboration with teachers to organise activities, events and resources to help inspire the next generation of scientists.

Highlights include:

- **Monthly evening lectures**
- **Particle Physics Master Classes**
- **Physics Taster Days**
- **Stargazing Oxfordshire** – astronomy events.
- **Speakers for schools**
- **LHSee android app**

# UNIVERSITY OF PORTSMOUTH

Portsmouth, Hampshire, PO1 2UP  
research.icg.port.ac.uk/outreach  
www.port.ac.uk/departments/academic/sees/physics/physicseducation/



The University of Portsmouth has an active physics outreach programme, delivered by the Institute of Cosmology and Gravitation (ICG) and the new Applied Physics course, which brings together physicists from several departments including Earth and environmental sciences, radiography and the ICG. Highlights include:

- **The annual Cosmology Masterclass** – a one-day event for A-level students that includes an introduction talk, a session on past A-level cosmology questions and a chance to hear about cutting-edge research from a leading cosmologist.
- The ICG runs **Zooteach** workshops using the citizen science project Galaxy Zoo. Students contribute to real research by classifying galaxies and then find out more about the physics behind them. Zooteach teacher workshops are also available.
- **School visits** – visits to the university.
- **CPD training** – training for physics teachers.
- **Public physics lectures** – The ICG, the Portsmouth and District Physical Society and the university's Physics society all organise public physics lectures in Portsmouth throughout the year that are suitable for older students.

# ROYAL HOLLOWAY, UNIVERSITY OF LONDON

Egham Hill, EGHAM, TW20 0EX  
[www.rhul.ac.uk/physics/outreach/home.aspx](http://www.rhul.ac.uk/physics/outreach/home.aspx)



We seek to foster an interest in physics and to show that physics is fun. Our programme of activities has been designed with teachers and learners to ensure that each activity enriches study based on the National Curriculum including the new Diploma. Highlights include:

- **A level masterclasses** – two-day events at our campus for Year 12 students. These include Particle Physics, and new in 2013 Condensed Matter Physics, through university-style lectures, a session in our teaching laboratories and other hands-on activities.
- **Physics Taster Days** – for students who are thinking of applying to do a Physics degree:

hands-on activities in our teaching laboratories, two lectures by scientists about their work and a Q&A with our admissions tutor.

- **Talk Science** – a selection of experiments brought to your school for students to work with. In small groups, they prepare a short talk to explain their experiment to their peers. The best talk receives a small prize.
- **Operation Golden Eagle** – a chance for students to become secret agents for the day and solve scientific challenges. Students are tested, points are awarded for scientific skill and teamwork and prizes are presented to the winning team.

# QUEEN MARY, UNIVERSITY OF LONDON

Mile End Road, Mile End, London, E1 4NS  
[ph.qmul.ac.uk/engagement/outreach-activities](http://ph.qmul.ac.uk/engagement/outreach-activities)



Our aim is to encourage more students to take physics as a subject at degree level by widening access to university researchers and providing engaging, interactive activities for a range of age groups. Highlights include:

- **Physics Academy** – a week long summer school will allow attendees to investigate a specific area of physics before presenting a short talk to their own teachers and our academics.
- **Cassini Scientist for a Day Competition** – through writing a 500-word essay, young scientists are invited to take control of the Cassini spacecraft for a day.
- **Physics taster days**
- **Academic speakers in schools**

# UNIVERSITY OF SOUTHAMPTON

University Road, Southampton, SO17 1BJ  
[www.phys.soton.ac.uk/outreach](http://www.phys.soton.ac.uk/outreach)

UNIVERSITY OF  
Southampton

Photograph by Andy Vowles

The University of Southampton is committed to delivering a wide-ranging outreach programme with all activities provided free to schools – suitable for Primary through to College levels. Highlights include:

- **Speakers for Schools** – covering astronomy, particle physics, nanotechnology and photonics from 'Rocks from Space and the Death of the Dinosaurs' to 'The Higgs Boson'.
- **Physics and Astronomy Workshops** – available in Astronomy, Particle Physics and Photonics. From 'the Solar Walk' – which paces out the scale of the distance between planets, through to Holography Workshops.
- **The Light Express Laser Roadshow** – with demonstrations which explain the science behind the internet.
- **Resources for Teachers** – History of the Universe CD, a journey back to the Big Bang; An Electromagnetic Spectrum Resource Pack of quizzes and information sheets for GCSE students.
- **The Newtonian Legacy** – a free e-book by Prof Nick Evans: a racy crime drama involving particle physics. (16+ years).
- **Science and Engineering Family Day** – the annual award-winning event in March in Science Week: hands-on activities for the whole family.

# UNIVERSITY OF SURREY

Stag Hill, Guildford, GU2 7XH  
[www.surrey.ac.uk/physics/schools](http://www.surrey.ac.uk/physics/schools)



The University of Surrey runs a range of activities for schools and colleges to enthuse and inspire students about physics and raise awareness of the opportunities in physics. Highlights include:

- **Academic speakers** – researchers visit schools with talks on a range of subjects from nuclear physics to lasers.
- **Physics taster days** – including a lecture and a practical session in our undergraduate labs.
- **Physics competition** – a one day hands-on challenge activity for teams of KS5 students.
- **Balloon rockets** – workshop for KS2-3.
- **Bespoke activity days** – both in school and on campus.



# UNIVERSITY OF SUSSEX

Brighton, BN1 9RH  
[www.sussex.ac.uk/physics/outreach](http://www.sussex.ac.uk/physics/outreach)

**US** University  
of Sussex



The University of Sussex offers a wide variety of outreach offerings, many of which are closely related to our research strengths in astronomy and particle physics. Highlights include:

- **Masterclass days** – in both particle physics and, new in 2013, astronomy.
- **Research Lab tours** – your students can witness inspirational cutting-edge physics research first-hand.
- **Schools-lab experiment days** – run by our visiting award-winning teacher David Daniels. These days consist of a series of experiments specifically designed for either GCSE, AS or A2 level physics students, and includes a 30 minutes research talk (aimed at the appropriate level) by one of our researchers in the department.
- **Bespoke days** – to schools and colleges. Either we can visit you for the day, or you can visit us. A selection of activities can be selected from our web site, and once we know your expected arrival and departure time, we can put together a timetable which specifically suits your preferences.
- **Lectures** – Institute of Physics South-Central branch series of lectures, held monthly during term time on Tuesday evenings.

# CONTACTS

For information about regional programmes and what SEPnet can offer you, contact:

**Director of Outreach** – [outreach@sepnet.ac.uk](mailto:outreach@sepnet.ac.uk)

For information about specific events, please contact your nearest SEPnet officer:

**University of Kent** [kent.outreach@sepnet.ac.uk](mailto:kent.outreach@sepnet.ac.uk)

**University of Oxford** [oxford.outreach@sepnet.ac.uk](mailto:oxford.outreach@sepnet.ac.uk)

**University of Portsmouth** [portsmouth.outreach@sepnet.ac.uk](mailto:portsmouth.outreach@sepnet.ac.uk)

**Royal Holloway, University of London** [rhul.outreach@sepnet.ac.uk](mailto:rhul.outreach@sepnet.ac.uk)

**Queen Mary, University of London** [qmul.outreach@sepnet.ac.uk](mailto:qmul.outreach@sepnet.ac.uk)

**University of Southampton** [southampton.outreach@sepnet.ac.uk](mailto:southampton.outreach@sepnet.ac.uk)

**University of Surrey** [surrey.outreach@sepnet.ac.uk](mailto:surrey.outreach@sepnet.ac.uk)

**University of Sussex** [sussex.outreach@sepnet.ac.uk](mailto:sussex.outreach@sepnet.ac.uk)



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[www.sepnet.ac.uk/outreach](http://www.sepnet.ac.uk/outreach)