The classroom and beyond
Education support and activities 2012

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This brochure was produced by IOP using sustainably sourced materials.
Scottish Summer School
The Institute, in conjunction with the Scottish Executive and the Scottish Schools Equipment Research Centre, supports the annual Scottish Summer School, a residential course that gives teachers the opportunity to explore contemporary issues in physics education with colleagues and professional scientists.

Meetings and conferences
The Institute supports various one-day meetings and conferences across the whole of the UK and Ireland, providing subject-focused CPD for all teachers of physics. Some of these are organised centrally and others by regional branches or Physics Network coordinators.

Exploring Physics, Uncovering Choice – careers advice and guidance
This workshop pack of activities aims to encourage staff to work together in providing a consistent approach to careers advice and guidance in their school. It will also help teachers to build on their own knowledge of physics-based careers and, in turn, help students to make informed choices based on accurate information.

Get involved

Education Forum
The Institute represents the interests of physics and its members in policy discussions, consultations and responses. The Education Forum allows us to seek the views of the physics education community and involve them in supporting some of our work, in particular with regard to the National Curriculum and public examinations. To join the forum, you must be a member of the Institute or the nominated teacher in an affiliated school or college. Most of the discussions take place online through www.talkphysics.org/forum, with periodic physical meetings. To join the forum, e-mail education@iop.org and put “Education Forum” in the title.

Membership and affiliation
Our affiliation scheme is the simplest way of building a link between your school or college and the Institute. You get the benefits outlined on p3 and it allows the nominated teacher to join the Education Forum.

Becoming an individual member of the Institute takes the relationship to another level. It means that you can become more involved with governance of the Institute and provides you with other benefits, including access to careers advice and chartered status. There are three grades of membership: associate, member and fellow. You can find out more about eligibility and the application process at www.iop.org/membership.

Student teacher affiliation, which is free, is a way of building a bridge between trainees, the Institute’s education department and other teachers (p10). When you leave training you can continue the relationship with the Institute, via one of the routes outlined above.
**Teachers’ continuing professional development**

**Marketing Initiative for Teacher Recruitment (MITRE)**

The MITRE project looks at ways to address the shortage of specialist physics teachers entering the profession. This includes promoting physics teaching as a career to various different audiences, including undergraduate students, IOP members and working physicists, as well as providing support to Initial Teacher Education (ITE) providers to help them market their PGCE physics courses more effectively. In addition, IOP Teacher Training Scholarships have just been launched. These are funded by the Department for Education and offer awards to a hundred outstanding individuals wishing to embark on a physics ITE course in England in 2012. E-mail teach@iop.org for more details.

**Learning to Teach Physics NEW**

This is a new programme supporting novice science teachers as they build their confidence in teaching physics. It was launched at a parliamentary reception in summer 2011 and aims to tackle the science teacher retention issue. Support covers all student, NQT and early-career science teachers in the UK and Ireland. Students’ involvement with the Learning to Teach Physics programme begins with their training period when they receive a booklet highlighting Institute resources and encouraging them to register with the Student Teacher Affiliation scheme. Visit www.iop.org/education/ltt for more information.

**Student Teacher Affiliation**

A dedicated free scheme for all student teachers in secondary science in the UK and Ireland. Student teacher affiliates will receive advice and support throughout the year through a combination of routes, including access to www.talkphysics.org, regular e-mail bulletins and resources to help develop teaching expertise in physics. Our two bloggers, an early-career teacher and a student teacher, share their experiences of teaching at www.iopblog.org/education-2/.

**ITE Centre Affiliation**

ITE centres are able to join the affiliation scheme and receive the same benefits as schools and colleges. See p3 for details of the scheme. Centres can quality for free affiliation if they have a visit from a Physics Network coordinator. E-mail ite.centre.affiliation@iop.org for details on how to apply.

**Physics Teachers’ Network**

The Physics Teachers’ Network was established to encourage the sharing and developing of ideas for teaching physics. The network is run by coordinators, who are current or recently retired teachers. They organise local group activities and INSET, and the network covers the whole of the UK and Ireland. The network has developed a number of off-the-peg workshops, but sessions can be tailored to meet the individual needs of the teachers and pupils in each school. Schools can request a workshop at a time and place to suit them. To find a local coordinator visit www.iop.org/network.

**Physics Updates**

These are two-night/three-day residential courses for physics teachers. The lecture component of the programme is devised to update participants on innovations in physics, both pure and applied, as well as curriculum developments. Workshops allow teachers to try new equipment, learn new experimental techniques, try out novel investigations and share their experience. There are three courses a year (usually in March, July and December). Visit www.iop.org/update for application forms.

**Anthony Waterhouse Fellowship**

The Anthony Waterhouse Fellowship, which is worth £2500 over two years, provides an opportunity for current teachers of physics to access funds to help them develop a dormant or nascent idea that will be useful in the classroom. It is generously endowed by Helen Parsons in memory of her brother and his passion for physics. More information is available at www.iop.org/education.

**Physics Education**

A journal containing articles about the teaching of physics, plus news, teaching tips and reviews of textbooks and software. The journal is published six times a year and is largely focused on post-16 teaching. Affiliated schools have free access to the archive online.

**Physics World**

A leading physics magazine published monthly, which will help to keep you in touch with developments in physics as well as providing inspiration for your students.

In addition, affiliated institutions will benefit from:

- discount on Institute conferences and events such as Physics Updates and teacher meetings;
- information on local Institute branch activities;
- priority booking for I’m a Scientist, Get me out of here!;
- posters, resources and careers material produced by the Institute and other organisations;
- access to www.physicsworld.com.

**Affiliated Schools Scheme**

The Institute offers an affiliation scheme for schools and colleges, which costs £45 (£58) a year. International schools that teach the UK curriculum can also join the scheme for £70 a year. This entitles schools and colleges to receive the following publications:

- Classroom Physics – a newsletter published four times a year, with information about events, resources and training, as well as teaching tips and practical ideas focused on the 11–16 age group.
- Physics Education – a journal containing articles about the teaching of physics, plus news, teaching tips and reviews of textbooks and software. The journal is published six times a year and is largely focused on post-16 teaching. Affiliated schools have free access to the archive online.

See p3 for details of the scheme. Centres can qualify for free affiliation if they have a visit from a Physics Network coordinator. E-mail ite.centre.affiliation@iop.org for more details.
www.talkphysics.org is our community and resources website linking teachers of physics at all stages of their careers. It aims to bring together those who want to:

- join with teachers of physics and their supporters;
- learn to improve their teaching;
- help others to improve;
- search for particular groups for focused interaction and support;
- set up their own to work with others on tasks that they decide on.

Talk Physics is the home of our Supporting Physics Teaching (SPT) resources.

**E-mail discussion lists**
The education department supports a number of e-mail discussion lists designed to provide teachers with a forum to share ideas, ask for advice and exchange views. E-mails are sent to all list members and are automatically archived.

Lists include:
- PTNC: Physics Teaching News and Comment – for all those with an interest in the teaching and learning of physics;
- SPUTNIK: Scottish Physics Teaching News and Comment – for debating the big issues facing physics teaching in Scotland as well as exchanging ideas.

**Teachers’ Awards**
The Institute recognises outstanding teachers with their annual Teachers’ Awards. Every year several awards are made to exceptional teachers of physics at secondary level and teachers of science at primary level. Further information and nomination forms are available on the Institute’s website. The closing date for 2012 nominations is 31 May 2012.

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### Careers material and other resources

**Do try this at home – featuring Marvin and Milo**
A set of 24 colourful postcards is available, based on the Interactions feature “Do Try this At Home”. They can be used as teaching resources and they are also available at www.physics.org.

**Marvin and Milo reward cards**
This is a set of six cards that can be sent home to recognise a pupil’s outstanding work in the classroom. The cards feature the popular cat and dog team. They are also available to download from www.iop.org/rewardcards.

**Posters (all ages)**
This is a set of four careers posters showing physicists at work: Physicists Earn, Solve, Create and Design.

**Stickers**
This set of 12 stickers can be used to reward students or teachers. These are intended to encourage students to make use of the resources on www.physics.org.

**Pocket physics**
An A6 booklet listing physics equations and definitions along with diagrams and useful data. A revision and homework aid for students aged 16+, this replaces the Best Pocket Physics Handbook.

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**See the world differently**
A new series of three high-tech interactive posters, to illustrate the wonder and awe that physics can inspire by allowing people to see the world differently. Each poster illustrates and emphasises at least one aspect of seeing the world differently: in a literal sense, in a metaphorical sense and by modelling. The posters change when the conditions alter in the dark, under UV light or when they are heated up. For more information on how to use them go to www.talkphysics.org/world or www.physics.org/world.

**The Exp series**
The Explore/Expand/Experience career series is a set of modern, targeted careers resources that span the 11–19-year-old age group. Additional resources to help integrate their use in the classroom are available from www.iop.org/education/careers.

**My Physics Course**
The new website www.myphysicscourse.org is a guide for students considering physics at university in the UK and Ireland. It lists all accredited physics degree courses and typical grade offers. It is unique in the number of ways that students can search or compare courses. Not only can students look up a particular university, they can also browse courses by subject combinations, or by distance from a given postcode. Degree listings are also still available in print as Physics on Course.
Resources for the classroom

Teaching advanced physics?
Looking for resources to teach physics to students aged 16–19? Go to www.tap.iop.org for detailed lesson plans with extensive coverage of all UK courses.

The website for all your physics needs www.tap.iop.org

Teaching Advanced Physics (TAP)
This website covers almost all of the post-16 content for A-level specifications in England and Wales and Advanced Higher in Scotland. It provides teaching tips for key concepts, as well as lesson plans, experimental details and questions for pupils. It will be particularly useful for newly qualified teachers in their early years of teaching and for non-specialist teachers. It is one of the largest free resources of its type, with everything fully downloadable as Word documents to be customised by teachers. Visit www.tap.iop.org.

Teaching Radioactivity
These resources help support the teaching of radioactivity, enabling teachers to give students a more authentic and engaging experience of ionising radiations and sub-atomic particles. They include a television programme in which the presenter leads a group of teachers through a series of activities that illustrate the properties of ionising radiations, as well as animations and a background radiation worksheet to use in the classroom. The resources are available on our website and on DVD.

Physics and Ethics Education Project
www.peep.ac.uk is an interactive website and virtual learning environment for secondary school science teachers and their students. This teaching resource has been developed to highlight the moral, ethical, social, economic, environmental and technological implications and applications of physics.

Teaching Astronomy and Space
These resources aim to support the teaching of astronomy and space to 11–16 year olds and are built around a series of five television programmes. Within the programmes there are sections to use with students, where astronomers talk about their work in an inspiring and engaging way, as well as guidance and advice on setting up and managing practical activities with students. The activities are supported by full teaching notes. The resources are available on our website and on DVD.

PRACTICAL PHYSICS

Practical Physics
Together, the Institute and the Nuffield Foundation have developed the Practical Physics website to help all teachers of physics share their skills and experience of making experiments and demonstrations work in the classroom. The website includes information on apparatus, procedure and teaching notes, together with general guidance on teaching approaches. The website also includes a section on “How science works”. Visit www.practicalphysics.org.

The MODEL project: practical physics at work
This DVD resource aims to provide engaging and relevant practical experiences for students aged between 14 and 16 years. It includes ideas for practical physics activities, student instructions and worksheets, plus guidance for teachers and technicians. The practical activities are supported by video sequences showing how some people use physics in the jobs they do. Links to the relevant UK specifications are included.

Are you a good scientist?
This is a poster and set of questions for use with students, highlighting safe and ethical approaches to scientific work. The resource is intended to act as a stimulus for teaching about science, as well as helping students to understand the importance of behaving ethically in terms of their own work.

Teaching Medical Physics
The resources that have been available for a few years are being fully revised and updated for 2012. These will include practical ideas and teaching notes for various diagnostic imaging techniques and radiotherapies. The materials will be free from www.teachingmedicalphysics.org.uk and on DVD, along with the 2011 Schools lecture “From X-rays to Antimatter – the science of seeing inside your body”.

The Virtual Physical Laboratory (VPLab)
Developed with the National Physical Laboratory, VPLab software contains more than 180 simulations and interactive experiments for teaching physics to 14–19 year olds. Currently this resource is provided free of charge to teachers who attend a demonstration at Physics Teacher Network sessions or Institute INSET events.

SimPhysics
Four interactive games are available to use for teaching energy, space and sound to 13–16 year olds. The games are designed to help students to engage with the physics that they need to use to solve problems and win the games. They are downloadable from the Institute’s website, along with supporting teaching notes.

Physics in Concert
This resource is based on the Ashfield Music Festival activity (p8) and incorporates many of its features, but it can be run in lessons. Students work in teams and explore how physics applies to the context of planning a music event. The resource for 13–14 year olds is available from www.iop.org/concert and in printed form.
Extra-curricular resources for students

Schools and colleges lecture tour
The schools and colleges lecture has been delivered by a series of acclaimed physics communicators annually, throughout the UK, since 1993. The free lecture demonstration is designed to show contemporary developments in physics to 14–16-year-old school pupils in an engaging and stimulating way. The 2012 lecture, entitled “Physics and the Games: a winning formula”, will explain how physics is being used to boost the chances of national success in the London 2012 Olympics. Dates and venues can be found on the Institute’s website. DVDs of previous lectures are available.

Physics in Perspective
This is a three-day course for sixth-formers and college students, running from 12 to 14 February 2012 in London, with the purpose of bringing some of the excitement, relevance and fun of physics to participants. The speakers are chosen for their ability to make physics come alive, by illustrating its impact on our lives and exploring its potential for shaping the future world through engineering and technology. Early booking is recommended.

16–19 membership
Free electronic membership of the IOP is available to all students studying physics in this age group, with access to Physics World online and physicsworld.com. They receive regular updates on what’s new in physics, exam and university guidance and information about careers related to physics, as well as the chance to interact with other young physicists. There are also competitions and lots of other exclusive 16–19 member offers. Go to www.iop.org/16-19 to join up.

Ashfield Music Festival
This is a simulation activity and the pack contains all you need to run a one-day, off-timetable activity with a large group of 14–15-year-old students. The students work in teams to plan a music festival; they take on specialist roles within the teams and seek advice from a group of “experts”. The aim is to show students that a knowledge and understanding of physics is useful in the world of business and enterprise. It is a good opportunity to bring in outside support (parents and STEM Ambassadors) and include physics in a school’s enterprise agenda. Go to www.iop.org/ashfield to download the resource.

Sciencelve
The www.sciencelve.net website is an online directory of talks, presentations and workshops delivered by professional science and engineering communicators and committed enthusiasts. Sciencelve helps you to find a suitable speaker or presenter for your event, and makes it easy for you to arrange visits from subject experts and engaging communicators. The website is supported by the Institute of Physics, the British Science Association and the Scottish Government.

Physics activity pack for STEM clubs
The activity pack contains physics-based ideas, resources and activities for science, technology, engineering and mathematics (STEM) clubs. The resource is available on a DVD.

IOP/IET/STFC School Grants Scheme NEW
This co-funded scheme provides schools and colleges with grants of up to £500 for small-scale projects or events linked to the teaching or promotion of physics and engineering. Projects and activities linked to astronomy, space and particle physics or engineering and technology are particularly encouraged. Grants will not normally be given to meet costs that should be met from school budgets, or for projects that will run regardless of whether an award was made.

The scheme is open to all UK schools and colleges, catering for pupils and students in the 5–18 age range. There are three deadlines a year: 1 February, 1 June and 1 November. To facilitate a quick response, applications will only be accepted electronically using a simple form available on the Institute’s website.

Guide for Action, which makes suggestions on how schools and teachers can review their own practice and take steps to increase the participation of girls in physics. Two accompanying 15-minute programmes are available for use in INSET sessions.

The Institute has also worked with the Science Learning Centres on an action research programme, which used the Institute resources as a starting point. The second phase, in 2008, enabled teachers from 100 schools to participate. The evaluation report was published by the DCSF in April 2009 and a follow-up report will be published in 2012. Engaging with Girls – an action pack for teachers, with advice on action research and teaching resources, was published in February 2010.

The Institute’s materials continue to be widely used as a starting point for teachers and other professionals looking at interventions in schools and classrooms. These resources can be downloaded from www.iop.org/girlsinphysics.

Supporting Physics Teaching (SPT)
SPT is a set of structured resources, designed and produced by the Institute, that support the development of teachers’ subject knowledge.

They are used by individuals, departments, IET providers and external training providers.

SPT consolidates good practice among physics teachers with sound teaching approaches and tools. There is a set of five topics focused on the needs of teaching 11–16 year olds. Teachers working with 14–16 year olds can draw on two new topics, with the final one in preparation.

To find out more go to www.iop.org/spt.

The resource is available online as a series of downloadable interactive PDFs. To get the resources go to www.talkphysics.org and