Programme

09:30 – 10:45  Registration, coffee and exhibition in the Temple Speech Room
10:45 – 10:55  Welcome in Macready Theatre
10:55 – 11:40  Lasers and Super Exciting Research: it’s all in the name!, Dr Ceri Brenner, Central Laser Facility, Science & Technology Facilities Council
11:40 – 12:25  What Happens Next?, David Featonby
12:25 – 13:45  Lunch in Sports Centre Café
               Exhibition and coffee in Temple Speech Room
13:45 – 14.45  Workshop session 1 in Science Faculty (see below for details)
14:45 – 15:45  Workshop session 2 in Science Faculty
15:45 – 16:00  Thanks to all and refreshments in the Science Faculty Atrium

Workshops

Teachers will have a choice of two workshops from the following:

- Teaching Forces and Motion with Confidence, Dr Andy Davies, Rugby School
- Marsquakes: Seismology on Another Planet, Paul Denton, British Geological Survey
- Saturday Science for Every Day: Simple but subtle things to make yourself from the world of sensors, Neil A. Downie, Air Products/University of Surrey
- Using isaacphysics.org to Support A-Level Learning, Ally Davies, University of Cambridge
- Embedding Formative Assessment in 11-14 Physics Teaching, Mary Whitehouse, University of York
- Using Astronomy to Inspire Enquiring Minds, Dr Chris North, Cardiff University
- Improving Gender Balance in the Physics Classroom, Dr Jessica Hamer, Institute of Physics
Lasers and Super Exciting Research: it's all in the name!
Dr Ceri Brenner, Central Laser Facility, Science & Technology Facilities Council

Lasers are the greatest multi-taskers; from telecommunications to surgery, from space missions to cutting through steel, they’re used everywhere. But did you know that we are also using the most powerful lasers in the world to tackle some truly global challenges? We’ll explore how lasers can provide for our rapidly growing energy demands, how they will help spot and treat cancer, and how they can be used for the safe handling of nuclear waste.

What Happens Next?
David Featonby

The "what happens next?" column has now been a regular feature of the Physics Education Journal for a few years, in which readers are challenged to predict just that - "what happens next?" in simple experiments with what may be described as discrepant outcomes. Such experiments can be used in a variety of settings to challenge students' understanding and engage them in useful scientific discussion. David's talk, with several demonstrations, will highlight some of the ways in which these experiments can be used in schools, and give the audience a flavour of a student's experience, when faced with thinking "outside the box".

Teaching Forces and Motion With Confidence
Dr Andy Davies, Rugby School

No chat or talk just the opportunity to play with practical demos and experiments relating to forces and motion, relevant to the full spectrum from key stage 3 to key stage 5. An experienced physics teacher and technician will be on hand to assist and give advice. Each delegate will receive a booklet of colour photographs and explanations for each practical.

Probably most beneficial to teachers who are relatively new to physics teaching or teaching A-level for the first time but hopefully there will be some novel ideas even for the more experienced teachers. We will get out every bit of kit that we can think of!

Marsquakes: Seismology on Another Planet
Paul Denton, British Geological Survey

The NASA INSIGHT mission to Mars will be the first opportunity for scientists to study seismic signals from the red planet. The mission (now with a rescheduled launch date in 2018) will allow detailed geophysical investigations of martian seismology and heatflow measurements. The lander will deploy a pair of sensitive seismometers (one very low frequency French and one British instrument based on MEMS technology). The expectation is that these sensors will detect signals from marsquakes, meteorite impacts and atmospheric noise signals.

The British Geological Survey and the National Space Academy have teamed up to develop a set of hands-on practical activities that teachers and students will be able to use to better understand the nature of these signals, how they originate and how they are recorded. This workshop will be introducing the science behind the mission and some of these practical activities.

Saturday Science for Every Day: Simple but subtle things to make yourself from the world of sensors
Neil A. Downie, Air Products/University of Surrey

"Neil A Downie author of ‘Vacuum Bazookas’ and ‘Ultimate Book of Saturday Science’ will offer a workshop full of fun projects adaptable for all ages. Based on decades of experience as an R&D scientist first in fundamental particles and then in industrial gases and sensors and as a Saturday Science club leader, the projects use inexpensive and easy-to-obtain parts. Come prepared to have some hands on fun whilst you play with some practical physics."

Using isaacphysics.org to Support A-Level Learning
Ally Davies, University of Cambridge
See how isaacphysics.org can mark your homework online for free, saving you time and giving your students immediate feedback that's also much more useful. See how "skills mastery" questions lead on to more challenging "problem solving" tasks. Learn how to use isaacphysics.org to help prepare your students to thrive on physics-related degree courses.

This session is in a computer room. If you register for isaacphysics.org during this session, you will also need access to your email to verify your account.

**Embedding Formative Assessment in 11-14 Physics Teaching**
Mary Whitehouse, University of York

This workshop will look at strategies (together with some questions and tasks) that can be used to support assessment for learning in 11-14 physics teaching.

**Using Astronomy to Inspire Enquiring Minds**
Dr Chris North, Cardiff University

Whether it's looking at the Universe in x-rays, or talking about gravitational waves, astronomy can be used as a fascinating context to teach physics across a range of ages, as well as to teach astronomy on the curriculum as well. Dr Chris North will give an overview of the resources available, both electronic/online and hard-copy, for using astronomy to teach other areas, whether it's using stars to teach about black body radiation, or using trigonometry to understand and pinpoint the sources of gravitational waves. He will also demonstrate online delivery tools such as Inspiring Science Education to aide delivery, assessment and monitoring.

It may be useful (but by no means essential) to have a laptop or other device to access the web.

**Improving Gender Balance in the Physics Classroom**
Dr Jessica Hamer, Institute of Physics

Using the latest findings from the IOP’s Improving Gender Balance and Drayson Projects, this workshop will explore strategies which can be used to engage and support all students in the physics classroom.

Topics covered will include:

- Embedding careers into classroom practice
- Unconscious bias
- Effective grouping
- Enrichment activities
- Classroom environment