

Programme and workshop summaries

Registration and refreshments 9.15 - 9.45

Welcome 9.45 - 9.55

Workshop 1 10.00 - 11.10

 **1A Electric circuits** - Developing a sound model for basic circuits that help teachers and students develop an understanding and appreciation of the underlying principles and processes of electric circuits. This will help teachers teach and technicians support this vital topic. (KS3/4)

 **1B Waves and the electromagnetic spectrum** - Looking at the general properties of waves and how different types of waves are used. The emphasis will be on practical activities and demonstrations. (KS3/4)

 **1C Magnetism and electromagnetism** - After a brief revision of basic magnetism we'll look at electromagnets, the catapult field and motor effect, electromagnetic induction and generators, transformers, the use of Fleming's rules. All will be based on experiments you can do in the classroom. (KS3/4)

 **1D Radioactivity: getting a feel for radioactivity** - Is radioactivity dangerous? What do we need to be careful of, and how can we avoid communicating half-truths? How is radioactivity detected, and what practical activities can we offer students to enhance our teaching? We put the risks in context and let you try out practical activities.

Workshop 2 11.15 - 12.45

 **2A Embedding careers in classroom practice** - Exploring the STEM related activities available for schools to use and reflecting on how successful these are in encouraging students to choose careers in physical sciences and engineering. Looking at straightforward experiments that have links to careers that make use of physics, considering the advantages of making links with employment and continuing education when teaching students.

 **2B Developing resilience** - Academically resilient students overachieve compared to peers and their circumstances, making the most of their abilities and opportunities. After this workshop, you will understand a simple model of academic resilience, and have strategies to support your students that you can use in the classroom straightaway.

 **2C Inclusive teaching: engaging all in the classroom** - Despite our best intents, some groups may not be as engaged as others in the classroom. By looking at what might be holding some groups back and how teachers and schools can inadvertently add to these barriers we can discover how we can be knocking those barriers down. Supported by research from the Institute of Physics and the Institute of Education, participants reflect on what can be done at a classroom level to encourage participation and progression of all.

 **2D Inclusive physics: beyond the classroom** - How can we engage underrepresented groups with physics? Student-focussed interventions outside of the classroom? School management and parental influence? During this workshop we will discuss strategies for engaging students beyond the classroom and identify best practice in promoting inclusivity in physics across the whole school.

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Lunch 12.25 - 13.25

Workshop 3 13.35 - 14.45

3A Teaching energy - The way we talk about and teach about energy has changed in recent years. We provide the background to those changes and provide ideas of how it can be presented to your students in a very accessible way.

3B Core physics practicals at GCSE (Part 1) - An opportunity to have a hands-on experience of most of the core practicals required for GCSE (KS4). *To provide sufficient time to cover the topic this session will continue into session 4B.*

3C Forces as you haven't been taught before - We can reduce a great deal of physics into: energy allows us to calculate if something could happen - forces explain what happens. Forces underpin a huge amount of physics but are often poorly understood. We look at why people have so many misconceptions about forces and what we can do about it. We will develop intuitive understanding and look at linking other areas of the curriculum to give a greater global picture of how physics concepts link together. (KS3/4)

3D IOP Enrichment activities: RAF100 and exoplanets - The IOP has developed context-based resources for lessons and science clubs. We introduce hands-on activities that illustrate: how physics applies to aircraft, and the search for habitable planets around other stars. You will have the chance to try out some of the activities, learn how to fly and search for aliens! (KS3/4)

Workshop 4 14.45 - 15.55

4A Favourite Demos - We are sharing some of our favourite classroom demonstrations with you. Use them to introduce new topics, provide a 'wow!' factor or illustrate physics principles in an entertaining way. Bring your own to share too! (KS3/4)

4B Core physics practicals at GCSE (part 2) - An opportunity to have a hands-on experience of most of the core practicals required for GCSE (KS4). *To provide sufficient time to cover the topic this session is continued from session 3B.*

2C Engaging physics - Looking at ways to make physics more engaging using a selection of toys, demonstrations and the IOP Marvin and Milo Cartoons. (KS3/4)

2D Earth and space: to boldly go... - Space is an engaging topic. Many children are fascinated by it and eager to learn about it. It's also rife with misconceptions. We address some of those misconceptions and explore the many practical alternatives to project work that are possible in this topic. (KS3/4)

Refreshments, evaluations and farewells. 16.00 - 16.15