



Time	Session						
09.15 – 09.45	Registration and refreshments and exhibitor stands						<b>Hall</b>
09.45 – 09.55	Welcome. Brief introduction to SPN, the school and today's programme – Steve Hearn, Charterhouse and Trevor Plant IOP						<b>Hall</b>
10.00 – 11.00 WORKSHOP ONE	<b>Workshop 1a</b> <i>Extreme Physics</i>  KS3 - 5	<b>Workshop 1b</b> <i>SEPnet Connect Physics interactive workshop</i> KS3	<b>Workshop 1c</b> <i>A Sense of Proportion: How to get them to remember all those equations</i> KS4	<b>Workshop 1d</b> <i>EM Spear make- and-take</i>  KS4-5	<b>Workshop 1e</b> <i>RAF100 STEM activities</i>  KS3-4	<b>Workshop 1f</b> <i>Using isaacphysics.org in your GCSE and A - Level Teaching</i>  KS4 - 5	
11.10 – 12.10 WORKSHOP TWO	<b>Workshop 2a</b> <i>Motor on a Pint – make &amp; take</i>  KS4	<b>Workshop 2b</b> <i>Fleming's left hand rule: <math>F = BIl</math></i>  KS4	<b>Workshop 2c</b> <i>Rotation marking – how to make your marking more effective and efficient</i>  KS3-4	<b>Workshop 2d</b>  <i>EM Spear make- and-take (repeat)</i>  KS4-5	<b>Workshop 2e +3e double session</b> <i>Rocket launcher make &amp; take</i>  KS3 - 4	<b>Workshop 2f</b> <i>RAF100 STEM activities repeat</i>  KS3-4	
12.10 – 12.30	Refreshment break						<b>Hall</b>
12.35 – 13.35 WORKSHOP THREE	<b>Workshop 3a</b> <i>Why do girls tend not to choose Physics A level?</i>  KS3 - 4	<b>Workshop 3b</b> <i>Football and Physics</i>  KS3 - 5	<b>Workshop 3c</b> <i>Problem solving to improve factual recall</i>  KS3-4	<b>Workshop 3d</b> <i>Energy – take it to the next level</i>  KS4	<b>double session continued</b> <i>Rocket launcher make &amp; take</i>  KS3 - 4	<b>Workshop 3f</b> <i>Woah! The physics of viral videos and other fun stuff</i>  KS3-5	
13.35 – 14.20	Lunch and exhibitor stands						<b>Hall</b>
14.25– 15.25 WORKSHOP FOUR	<b>Workshop 4a</b> <i>Inclusive teaching and the GCSE Required Practicals</i>  KS4	<b>Workshop 4b</b> <i>Football and Physics (repeat)</i>  KS3 - 5	<b>Workshop 4c</b> <i>Motor on a Pint – make &amp; take (repeat)</i>  KS4	<b>Workshop 4d</b> <i>Energy – take it to the next level (repeat)</i>  KS4	<b>Workshop 4e</b> <i>Maths for GCSE Physics</i>  KS4	<b>Workshop 4f</b> <i>Woah! The physics of viral videos and other fun stuff (repeat)</i>  KS3-5	
15.40 – 16.30 FINALE	<b>The Light Express Roadshow</b> Evaluation forms and goody bags						<b>Theatre</b>
CLOSE							

## WORKSHOP SESSION ONE CHOICES (10.00 – 11.00)

### 1a Extreme Physics – led by Neil Atkin, Teaching and Learning Coach and Gender Balance Officer, IOP

When a skateboarder learns a new trick the processes they use goes from planning, research, risk assessment (normally done very badly!) implementation then often peer feedback, evaluation and improvement. This effectively mirrors the scientific method. The skills they use are pure applied physics, but they don't consider themselves to be scientists. This session explores how we can use extreme sports as a vehicle for teaching physics as well as engaging these often hard to reach students. (KS3 - 5)

### 1b SEPnet Connect Physics interactive workshop – led by Dominic Galliano, SEPnet

SEPnet are launching a series of innovative and interactive workshops that add context to the physics of the KS3 Science curriculum. This session will give you the opportunity to try out the new activities, resources and see eye-catching demonstrations that introduce students to a variety of topics that are part of the study of Physics and encourage students to discover the links between these topics. (KS3)

### 1c A Sense of Proportion: How to get them to remember all those equations – led by Colin Piper, Teaching and Learning Coach, IOP

So, how do we get them to remember 20-odd equations. This workshop eschews triangles and rote learning in favour of getting students to actually understand what is going on. There will be a number of practical tips that have been found to work. (KS4)

### 1d EM Spear make & take - visualising an EM wave in motion – led by Richard Grimmer, Physics Network Coordinator, IOP

The EM Spear is a large model of an EM wave, showing the electric and magnetic field components. As well as making it easier to visualise an EM wave in terms of these fields, it can be used to demonstrate polarised v unpolarised waves, coherence and phase differences, and simply looks great hanging from the ceiling of your lab! (KS4 – 5)

### 1e RAF100 STEM Activities – led by Taj Bhutta, School Support Manager, IOP

The IOP has produced a series of practical activities, for use primarily in STEM clubs, to support the commemoration of the 100th anniversary of the formation of the RAF. This session will introduce the comprehensive package of materials and activities. You will have the chance to try out some of the practical activities and learn how to fly! Suitable for teachers and technicians. (KS3 - 4)

### 1f Using isaacphysics.org in your GCSE and A Level Teaching – led by Jo Kent, Isaac Physics and IOP

In this session, you will see how you can use Isaac Physics books and online resources in your GCSE and A-level teaching. You will also learn how to set (FREE) online homework assignments for your students and see their marks before you get into the next lesson. Less time marking; better feedback! This session will be in a computer room though you may wish to bring your own tablet or laptop. Please create an account with isaacphysics.org before the event. (KS4 – KS5)

## WORKSHOP SESSION TWO CHOICES (11.10 – 12.10)

**2a Motor on a Pint make & take** – Led by Jo Kent, Teaching and Learning Coach, IOP

Applying the Fleming's LHR and the motor effect to make a working motor model based on a festival beer 'glass'. KS4 primarily, though could be used at KS3 and KS5 too.

**2b Fleming's left hand rule:  $F=BIl$**  – Led by Gill Quinn, SPN Link+ trainer, Priory School

A concept that previously was only taught in A level. In this session, we will look at how to demonstrate the magnetic force qualitatively and quantitatively, we will explore how to engage pupils through novel approaches to applications such as building simple loudspeakers.

We will also look at wider applications of the rule, in this case to chemistry, observing how Fleming's left hand rule could be applied to a chemistry context, enabling students to visualise the application of the rule. (KS4)

**2c Rotation marking – how to make your marking more effective and efficient** – led by Dr Isabelle Parkes, The Arnewood School – SPN Lead School

Consistently high quality marking and constructive feedback can help pupils make rapid gains. All too often however it becomes a source of frustration and stress for teachers. In this workshop we will look at how rotation marking, an approach based on a simple sampling system, can make your marking more effective and efficient. Examples will be given and evidence provided as to how the approach can both reduce your teaching load and improve student outcomes. The views of teachers, students and Senior Leaders will be shared and discussed. (KS3 – 4)

**2d EM Spear make & take - visualising an EM wave in motion (repeat)** – led by Richard Grimmer, Physics Network Coordinator, IOP

See 1d for full description (KS3 – 5) (KS4 – 5)

**2e (+ 3e) (double length workshop) Rocket launcher make & take** – led by Liz Nourshargh, Physics Network Coordinator, IOP

Build your own "rocket" launcher. You can then use the compressed air launcher in the classroom to engage students with the design of the rockets. Through modifications such as adding fins or altering the shape of the nose cone, students can theorise and then try out how a rocket's flight path can be affected. (KS3 – 4)

**2f RAF100 STEM Activities (repeat)** – led by Taj Bhutta, School Support Manager, IOP

See 1e for full description (KS3 – 4)

## WORKSHOP SESSION THREE CHOICES (12.35 – 13.35)

**3a Why do girls tend not to choose Physics A level?** – Led by Neil Atkin, Teaching and Learning Coach and Gender Balance Officer, IOP

Why do girls tend not to choose physics A level? The proportion has remained stubbornly below 25% for the last 20 years.

What has the IOP and others research indicated as the main issues and what can be done about it. We will be looking at quick strategies as well as unconscious bias and whole school approaches. (KS3 - 4)

**3b Football and Physics** – Led by Lawrence Cattermole, Teaching and Learning Coach, IOP

Football may not be your favourite thing but, chances are, it will be for some of your students. We will use rich contexts such as when do you want your centre of mass to be high or low or when do you want to put backspin, sidespin, topspin or sometimes no spin at all on the ball? These allow us ways to integrate contexts, physics topics and practical skills. Topics covered will include forces, velocity, acceleration, moments, pressure, momentum, energy efficiency and assessing risk. These can be grafted in to your physics lessons and perhaps motivate some unexpected students to engage with Physics. (KS3-5)

**3c Problem solving to improve factual recall** – led by Dr Isabelle Parkes, The Arnewood School – SPN Lead School

The new GCSE requires students to understand and recall a large amount of content, not least the 20 or so equations that they need to know and be adept in manipulating. The students need also to be able to apply their knowledge in new contexts, something that even the brightest students find difficult. In this workshop we will look at how, by giving students well-structured opportunities to apply new ideas “in anger”, they can not only develop their problem solving skills but also improve their recall of key equations and ideas. This will be a practical, hands on workshop. (KS3 – 4)

**3d Energy – take it to the next level** – Led by Trevor Plant, Teaching and Learning Coach, IOP

Wherever you, and your department, are in adapting to the new ways of teaching energy this session will help you develop a little further to the goal of using energy in important calculations. (KS4)

**3e** – there is no choice for 3e because it is part of the double length workshop 2e

**3f Woah! The physics of viral videos and other fun stuff** - led by Joe Rowing, Exeter Mathematics School – SPN Lead School

During the session we will have a look at some of the ways to produce cognitive dissonance and those “Wow” moments in class. Material we will cover includes some counter-intuitive tricks and tips to leverage trends, gadgets and topical popular science to engage students in curriculum activity. Suitable for all key stages and enrichment. (KS3-5)

## **WORKSHOP SESSION FOUR CHOICES (14.25 – 15.25)**

**4a Inclusive teaching and the GCSE Required Practical** – led by Colin Piper, Teaching and Learning Coach, IOP

A strategy designed to involve all students, especially girls, in these compulsory activities that present varied challenges to schools teachers and students. (KS4)

**4b Football and Physics (repeat)** – Led by Lawrence Cattermole, Teaching and Learning Coach, IOP

See 3b for full description (KS3 – 5)

**4c Motor on a Pint make & take (repeat)** – Led by Jo Kent, Teaching and Learning Coach, IOP

See 2a for full description (KS3 – 5)



CHARTERHOUSE

## Stimulating Physics Conference at Charterhouse School – Saturday 7<sup>th</sup> July 2018



Supporting the Teaching and Learning of Physics

**4d Energy – take it to the next level (repeat)** – Led by Trevor Plant, Teaching and Learning Coach, IOP

See 3d for full description (KS4)

**4e Maths for GCSE Physics** – Led by Liz Nourshargh, Physics Network Coordinator, IOP

This session will help develop a solid understanding of the quantitative/mathematical skills needed for success in the KS4 physics curriculum. Strategies will be highlighted for key areas of difficulty for students, helping them to success in the classroom. (KS4)

**4f Woah! The physics of viral videos and other fun stuff (repeat)** - Led by Joe Rowing, Exeter Mathematics School – SPN Lead School

See 3f for full description (KS3-5)

### **FINALE: The Laser Light Express Roadshow**

This year we have a finale to the SPN Conference - The Light Express Roadshow that includes demonstrations and hands-on activities featuring laser light. See high-powered lasers in action using photonics equipment not generally found outside research labs and fascinating visual demonstrations showcasing the science behind the internet. There will be a dazzling range of experiments illustrating the physics of light, such as; 'total internal reflection', 'Tyndell's experiment', and transmitting music down a laser beam. Pearl John, Public Engagement Leader and the Light Express Roadshow team from Physics and Astronomy at University of Southampton run this breath-taking laser light display. The show is aimed at KS4 and KS5 and links well with a number of topics.

Please contact Suzy Gray [sg2@soton.ac.uk](mailto:sg2@soton.ac.uk) for any booking queries.

Book online via Eventbrite at [www.bit.ly/charterhouse2018](http://www.bit.ly/charterhouse2018)

*The event is very generously hosted and supported by Charterhouse School, near Godalming in Surrey.*

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