



# Hands-on, brains-on science

## Scotland Conference in partnership with SSERC

# 2023

Hello and welcome back. The Scottish Committee is organising a face-to-face conference on **Saturday 10<sup>th</sup> June 2023**. The Conference programme theme underpinning the event is **hands-on, brains-on science** and workshops will include Primary in the Early Years, Secondary Biology, Secondary Physics and Secondary Chemistry. Sessions will be of 55 minutes duration. We also welcome **Pop-up Science**, which focuses on sharing good classroom practice.

**Keynote speaker:** *Adrian Allan [Dornoch Academy]*

### Primary:

- **Thinking skills revisited** – Susie Burr [PSQM]
- **Unplugged Computing Science** – Kevin Reid [SSERC]
- **Be part of a brighter energy future!** – Nicola Jordan [RSC]
- **Active Global Citizenship through Primary Science** – Jennifer Buchan [Scotdec]
- **A Bee Workshop (includes focus on Explorify)** – Hayley Sherrard & Euan Mitchell [SSERC]
- **They say it's your birthday: Promoting STEM with poetry** – Nicky Souter
- **PSQM – Outreach: Increasing Science Capital using diverse books and vocabulary** – Bridget Lamb [Holy Cross PS] & Elaine Arbuckle [Mearns PS]

**Details of each workshop and curriculum links are listed on pages 2 to 6 of the newsletter.**

### Secondary:

- **Microscale Biology** – Annie McRobbie [SSERC]
- **Easy Bioinformatics Exercises to View Proteins, RNA & DNA in Genes & Genomes** – Suzanne Duce [Dundee University] & David Leader [Morgan Academy]
- **Sick Bag Biology** – Tess Watson [ASE]
- **Microscale Chemistry** – Chris Lloyd [SSERC]
- **Be a Magician** – Adrian Allan [Dornoch Academy]
- **Stealth Learning with Chemical Card Games** – Pete Johnson [Kitchen Chemistry]
- **Effective, research-based, study techniques** – Drew Burrett & Adrian Bailey [IOP]
- **Preparing for Practical Electronics** – Colin Oates [Kinross H.S.]
- **Visualising Electric Circuits** – Stuart Farmer [IOP]

### All:

- **Applying English as an Additional Language (EAL) in a science lesson** – Henrietta Ashley [Kinross H.S.]
- **Young STEM Leader programme** – Eileen McAleod [SSERC] & John Cochrane [SSERC & Greenfaulds H.S.]
- **Discover Materials Science & Engineering** – Chris Hamlett [Birmingham University]
- **Air Racing! Quadcopters as a STEM Resource in the Classroom** – Hannah Nisbet & Alisdair Stewart [Aerospace Kinross]
- **Effective Practical Work in Science** – Colin McGill [Napier University]

ASE SCOTLAND CONFERENCE 2023



# ASE Scotland Conference

The ASE Scotland Conference 2023, in partnership with SSERC, is a festival of best practice with sessions for everyone with an interest in science education: teachers, technicians, university lecturers, trainees, education advisors, CPD and resource suppliers and more.

Join us on Saturday 10<sup>th</sup> June 2023 to enjoy an array of workshops that will enable you to tailor your own unique professional development, whilst providing opportunities to network with like-minded professionals in the Scottish science education community.

You will be able to attend sessions on topics such as inclusion in science, sustainability, practicals in biology, chemistry and physics, diversity, outdoor science and much more...

## Primary workshops:

### Thinking Skills revisited – Dr Susan Burr

"Let's Think through Science" come for a refresher or a first look. Recent work on progression highlights the fact that children's ability to think about thinking (metacognition) is an important part of their learning. There are three elements to "Let's Think...", which supports the development of thinking in primary age children from early years to upper primary. These are activities to challenge (cognitive conflict), group working (social construction) and reflection (metacognition).

**Curriculum links:** supports all aspects of primary science curriculum with different examples for each stage

### Unplugged Computing Science: the foundation for understanding for - Kevin Reid

In this session we will consider the importance of unplugged computing science (CS) in helping learners to build a solid foundation of CS concepts. Through looking at various unplugged activities and resources, CS concepts, and cross curricular links, we will consider how engaging learners in the beginning stages of CS will help to lay the foundation for future understanding and development. We will also consider some next steps in the learning journey via introducing some play-based robotics equipment and how this can be implemented in your setting to develop computational thinking skills.

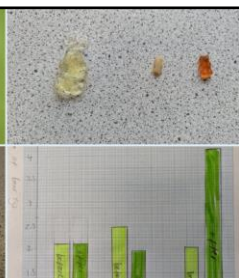
**Curriculum links:** Covers several outcomes from the Computing Science organisers 'Understanding the world through computational thinking' and 'Designing, building and testing computing solutions'.

### Active Global Citizenship through Primary Science - Jennifer Buchan

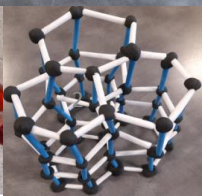
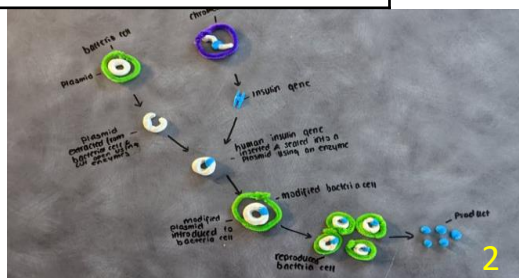
This practical session makes explicit the links between the Scottish Primary Science curriculum, Global Citizenship and Learning for Sustainability. Through exploration of resources, methodologies and planning tools, Primary teachers will be equipped to embed Global Citizenship in their teaching of Science. Course Aims: - To discuss what we mean by Global Citizenship and relate this to the Scottish Primary Science curriculum - To explore participatory methods and planning tools for different Primary Science topics - To look at ways to develop active citizen science across different topics.

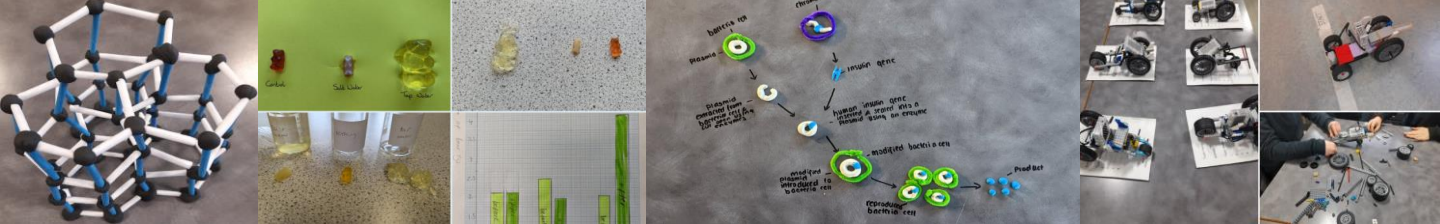
**Curriculum links:** Links to Learning for Sustainability, all Primary Science Es and Os, Citizen Science

ASE SCOTLAND CONFERENCE 2023



<https://www.ase.org.uk/events/ase-scotland-conference-2023>





**Primary workshops continued:**

**A Bee Workshop (includes focus on Explorify) - Hayley Sherrard & Euan Mitchell**

Take a closer look at this amazing insect and find out what can be done to support biodiversity in your setting. Find out more about the anatomy, behaviour and fascinating life cycle of the honey bee and its role as a pollinator. This workshop will provide lots of practical ideas and resources for early years and primary practitioners to try out with learners. There will be an opportunity to find out more about Explorify with specific links to this workshop.

**Curriculum links: Planet Earth: Biodiversity** I have observed living things in the environment over time and am becoming aware of how they depend on each other **SCN 0-01a**; I can distinguish between living and non-living things. I can sort living things into groups and explain my decisions **SCN 1-01a**; I can identify and classify examples of living things, past and present, to help me appreciate their diversity. I can relate physical and behavioural characteristics to their survival or extinction **SCN 2-01a**; I have helped to grow plants and can name their basic parts. I can talk about how they grow and what I need to do to look after them.

**SCN 0-03a**; I can distinguish between living and non-living things. I can sort living things into groups and explain my decisions **SCN 1-01a**; **Biological systems: Inheritance** By investigating the lifecycles of plants and animals, I can recognise the different stages of their development **SCN 2-14a**

**The say it's your birthday - Promoting STEM with poetry. - Nicky Souter**

A poem for every day of the year provides suitable contexts, and starters for STEM learning. Focusing on science has the potential to embed literacy as the vehicle, rather than endpoint of children's learning. A few days' poems will be illustrated. Delegates will discuss the validity of the suggested approaches, comment on the structure and make development suggestions.

**Curriculum links:** Various, including items from: SCN 1-20, TCH 1-15, MNU 1-22, LIT 1-31, HWB 1-51 etc

**PSQM – Outreach: Introduction; Increasing Science Capital using diverse books and vocabulary – Holy Cross PS, and Working towards Outreach and gathering evidence – a class teacher's experience**

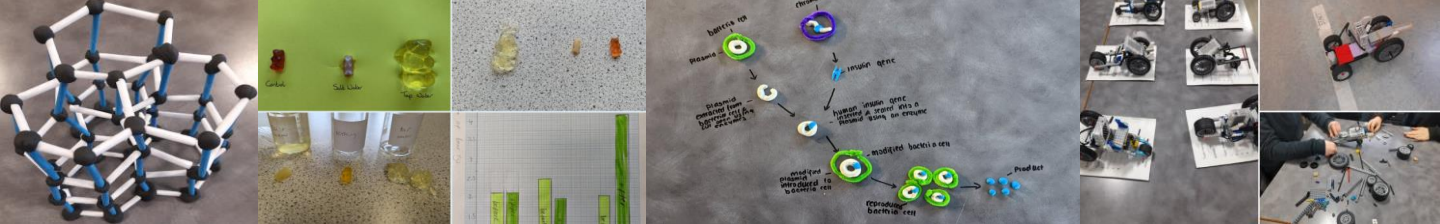
Bridget Lamb & Elaine Arbuckle

Two sessions from schools who are doing or have done Primary Science Quality Mark - Outreach Holy Cross PS: showcasing a targeted scheme to improve children's and families' science capital and experience of science, supporting both the library and classroom experience. The session also hopes to support and encouraging others to do the same.

Mearns PS: reviewing the PSQM experience and looking at the evidence that the school collected.

**Be part of a brighter energy future! – Nicola Jordan**

To tackle our growing climate crisis, we need to move away from fossil fuels and embrace electrification. A crucial part of this journey is bigger and better **batteries**; we need them to be a sustainable storage solution to ease our energy transition. In this session from the Royal Society of Chemistry, you'll learn how batteries can be made in primary classrooms from everyday materials and how to encourage your learners to think more about energy and sustainability. You'll hear how your learners can take part in an experiment alongside learners from across the world. This session will give you the opportunity to explore the science behind batteries – and why they are such an important part of our bright energy future.



## Secondary workshops:

### Microscale Biology – Dr Annie McRobbie (BIOLOGY)

In this session, we will explore microscale approaches to support delivery of the Biology curriculum, across BGE and N5 biology.

**Curriculum links:** The sessions will include use of enzymes (SCN4-13b - I have taken part in practical activities which involve the use of enzymes and microorganisms to develop my understanding of their properties and their use in industries; N5 Cell Biology, KA4) and fermentation (N5 Cell Biology, KA6). All the protocols are low-cost and quick to carry out and repeat. Perfect for the modern Science classroom.

### Easy Bioinformatics Exercises to View Proteins, RNA, & DNA in Genes & Genomes – Dr Suzanne Duce & David Leader (BIOLOGY)

Jalview is one of the most widely used programs for visualizing and analysing DNA, RNA and protein sequences. The Jalview team at the University of Dundee have developed easy, hands-on, web-based exercises helping pupils view and interact with these biological molecules for themselves. Sequences, 3D structures, and similarity trees of DNA, RNA and proteins can be viewed in its multi-window interface. The genetic mutation identified and their location on the 3D structure of protein viewed.

**Curriculum links:** photosynthesis, cell ultrastructure, biological molecules, classification, phylogeny, genetic technologies, health & disease

### Sick Bag Biology – Tess Watson (BIOLOGY)

From gums to bums - what happens to your food when you eat? From lungs to liver Do you know how to inflate lungs outside the body and what toxins can do to our tissues?

**Aimed at BGE Science**, in this session you'll find out lots of fascinating facts and how to demonstrate dissections of tissues safely with all the required risk assessments. It will be a hands on session not for the 'fainted hearted!' Dissections will include: Lungs (lamb); Heart (lamb); Liver (lamb), and Eye (Cod fish)

### Microscale Chemistry - Chris Lloyd (CHEMISTRY)

This is a hands-on, practical session showcasing a variety of microscale chemistry experiments and highlighting the ways in which the techniques can enhance teaching and learning, improve safety and also save money.

**Curriculum links:** BGE but some are also applicable to senior phase.

### Be a Magician! - Adrian Allan (CHEMISTRY)

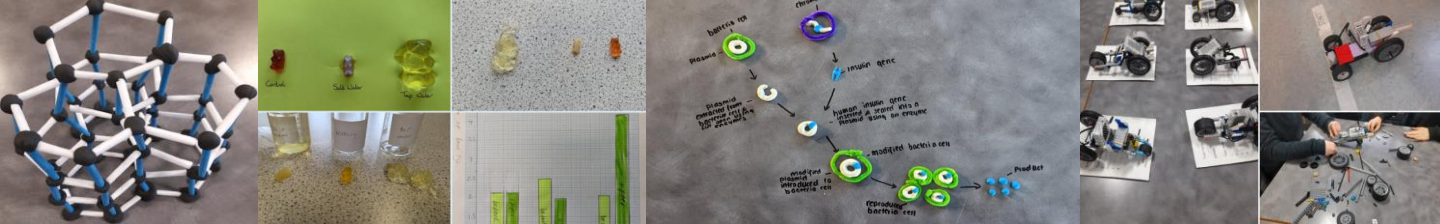
Spectacular science demonstrations and magic illusions have many things in common. They involve practice, showmanship, audience interaction and suspense followed by a moment of astonishment. This workshop will show an exciting selection of magic "tricks" which are in fact demonstrations of hidden science. Use them as introductions to topics or simply as puzzles for students to solve. These demonstrations can be used by teachers but can also be taught to students.

**Curriculum links:** This has links to the BGE and chemistry in the senior phase. The demonstrations can be used to help teach polymers, alloys, combustions, smart materials and catalysts.

### Stealth Learning with Chemical Card Games - Pete Johnson (CHEMISTRY)

Chemical card games are a great tool for getting students to think about chemistry without realising they are actually doing it. These active learning activities are great for introductions to new concepts, consolidation or plenary activities. This session will look at a variety of different games and how to make your own or give the power over to your students.

**Curriculum links:** All areas of the chemistry curriculum are covered from BGE to Advanced Higher.



## Secondary workshops continued:

### Effective, research-based, study techniques. - Drew Burrett (PHYSICS)

Cognitive science research into effective study practices have identified a range of techniques which can be applied across the full range of subjects to improve student performance in assessments. Based around resources shared by the Learning Scientists - [learningscientists.org](http://learningscientists.org) - IOP Physics Coaches Andrew Bailey and Drew Burrett will discuss their use of these techniques in their own practice.

**Curriculum links:** Suitable for all subjects and levels.

### Preparing for Practical Electronics – Dr Colin Oates (PHYSICS)

This workshop is offered to those who are preparing and presenting National 5 Practical Electronics. There will be an introduction to the assignment and delegates will practise soldering on stripboards and printed circuit boards.

**Curriculum links:** SQA National 5 Practical Electronics

### Visualising Electric Circuits - Stuart Farmer (PHYSICS)

The workings of electric circuits involve many abstract ideas. In this hands-on workshop Stuart will draw on research and experience to explore how to make the invisible more concrete for learners. This will include how to make the most of modelling charge, current, potential difference, resistance, and series and parallel circuits. This workshop is suitable for teachers from BGE Level 1 to National 5.

**Curriculum links:** BGE SCN1-09 to SCN4-09 and N4/5 Electricity

## General workshops:

### Applying English as an Additional Language (EAL) in a science lesson. - Henrietta Ashley

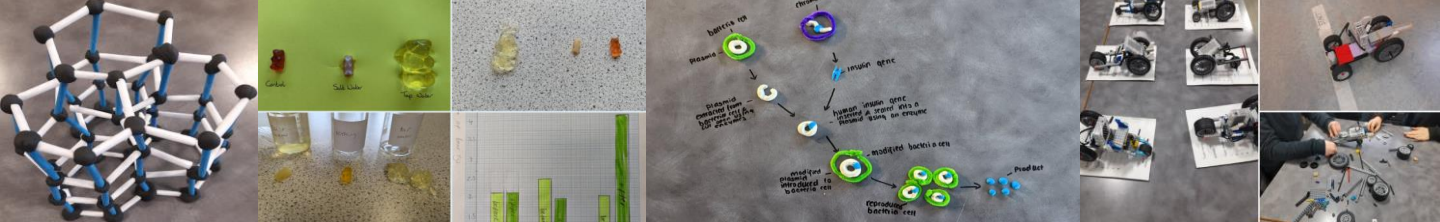
This interactive workshop highlights ways to support students with EAL. This can be applied to learners, for example, who have arrived in Scotland and have difficulty in learning English, or even have no English as a written or spoken language. The methods shown are straightforward to use for both teacher and student and require a low level of teacher preparation. I will demonstrate the different methods and provide opportunity for colleagues to try these and will share the benefits of utilising such a powerful tool in a science class and beyond.

**Curriculum links:** All areas of the science curriculum are covered from BGE to Advanced Higher.

### Young STEM Leader Programme - Eileen MacLeod & John Cochrane

This session will showcase how you can use the Young STEM Leader Award with the young people in your setting. It will be suitable for both primary and secondary practitioners. There will be a chance to try out activities from the programme and to share how the award is working for you already or find out how to introduce it in your setting. It will be delivered by John Cochrane and Eileen MacLeod who are both Area Regional Trainers and Verifiers for the Award.

**Curriculum links:** The award links to levels 2,3 and 4 of Curriculum for Excellence and has a focus on learning for sustainability. The formal levels are at SCQF levels 4,5 and 6.



### Discover Materials Science and Engineering - Chris Hamlett

Materials are the stuff from which things are made and Materials Science and Engineering (MSE) involves learning how materials behave, how to make new materials and how they can be used.

Discover Materials is a group of universities who promote MSE. We will introduce how we support teachers to deliver inspirational material science content in their lessons, the activities we can offer and give an overview of what we have in our exhibition stand.

**Curriculum links:** SCN 1-15a, SCN 2-15a, SCN 4-16a (Properties and uses of substances – Materials selection, physical properties of materials); SCN 1-08a (Forces – Magnetic materials); SCN 2-10a (Electricity – Batteries and making chemical cells); SCN 2-17a (Earth’s materials – Analytical techniques); SCN 2-18a (Chemical changes – Chemical properties of materials and interfaces); SCN 3-03a and 3-04a (Energy sources and sustainability – Thermal properties of materials and materials sustainability); SCN 3-11a (Vibrations and waves – Light and interactions of light with materials), and SCN 4-08 (Forces – Physical properties of materials)

### Air Racing! Quadcopters as a STEM Resource in the Classroom. - Hannah Nisbet

Science Educators from Aero Space Kinross will share the success of their Air Race Challenge for P6-S2 and demonstrate quadcopters as a potential STEM learning tool. Find out about the project and the success of the 2022 schools and have a go at manoeuvring a quadcopter yourself!

**Curriculum links:** Specific Experiences and Outcomes at Second & Third level were identified for the original challenge in the following areas: Forces, Design, Materials, Information Handling, Art & Design.

### Effective Practical Work in Science - Dr Colin McGill

Practical work is carried out in the science classroom to teach scientific concepts, increase motivation, develop practical skills and practise being a scientist. Research suggests that much practical work carried out in science classrooms has very little impact on the learning of scientific concepts. This presentation outlines how we can use principles from cognitive science to improve the use of practical work in the science classroom.

**Curriculum links:** BGE - Inquiry & Investigative Skills, Senior Phase - practical work to support learning

### Keynote

#### "The Art of Astonishment - Using Magic Illusions to Teach Science"

**Adrian Allan**

Performing science demonstrations and magic illusions both require involve practice, showmanship, audience interaction and suspense followed by a moment of astonishment. A selection of magical science effects will be presented that can be used to mystify, enthuse and engage students in the classroom.



## How to improve Primary Science in your classroom & throughout your school.

14/03/2023

Free

What makes the difference? How to improve Science, in your classroom and throughout your school.

<https://www.ase.org.uk/events/how-improve-primary-science-in-your-classroom-throughout-your-school>



## SSERC Event



## SSERC/STAC Technician STEM Training Day

21/03/2023

Free

The 2023 Technician STEM Day is here to give you some hands on practical professional learning in a wide range of subjects.

<https://www.ase.org.uk/events/ssercstac-technician-stem-training-day>



See page 11 for details.



## Online Physics for Non-Specialists - Waves (Module 4)

25/03/2023

This series of modules delivered online, aims to support non-specialist, early career and trainee teachers with physics teaching to Key Stage 4.

<https://www.ase.org.uk/events/online-physics-non-specialists-waves-module-4>



## Online Technicians Leadership Programme: Leading yourself and your team

30/03/2023

From £52 for ASE Technician Members

This one-day online course is one of three modules of the ASE Technicians Leadership series of courses.

<https://www.ase.org.uk/events/online-technicians-leadership-programme-leading-yourself-and-your-team-3>



## ASE: Practical Physics for Technicians Online

20/04/2023

From £52 for ASE Technician Members

This exciting course will help you as a technician to change this perception about physics practical work.

<https://www.ase.org.uk/events/ase-practical-physics-technicians-online-2>



## ASE: Practical Chemistry for Technicians Online

04/05/2023

From £52 for ASE Technician Members

This exciting online course will help you as a technician to change this perception about chemistry practical work.

<https://www.ase.org.uk/events/ase-practical-chemistry-technicians-online-2>



## Online Technicians Leadership Programme - Working with and training others

27/04/2023

From £52 for ASE Technician Members

This one-day online course is one of three modules of the ASE Technicians Leadership series of courses.

<https://www.ase.org.uk/events/online-technicians-leadership-programme-working-and-training-others-2>



## ASE Scotland Conference 2023

10/06/2023

Save the date for the ASE's Scotland Conference 2023 - a fantastic opportunity for anyone with an interest in the Scottish science curriculum!

<https://www.ase.org.uk/events/ase-scotland-conference-2023>



SCAN ME

# IOP Stirling Meeting & IOP Scotland/SSERC Physics Teachers' Summer School

Applications are open for the **two main events** in the Scottish physics education professional learning year. Both are being held shortly after the SQA physics exams.

## IOP Stirling Meeting

The annual conference for teachers of physics in Scotland takes place on **Thursday 25<sup>th</sup> May 2023**. The theme is on **using physics education research in your classroom** and to make the most of the in-person event, as well as the usual keynote talks, exhibitions, and networking there will be a choice of three from nine different workshops.

The early bird booking deadline is 23 March 2023. Full programme details and registration is available at: <https://iop.eventsair.com/spt48-2023/>.

As part of the conference package, all teachers and lectures from schools and colleges in Scotland will also receive a BeeSpiV light gate (worth over £30) thanks to the sponsorship of IOP Scotland and the support of the VITTA Group (formerly SciChem).

Come and meet friends old and new in the Scottish physics education community.

IOP Stirling Meeting 2023 Programme:

09:15-10:00	<b>Registration, Refreshments and Exhibitions</b> <a href="#">Wallace Monument Room</a>		
10:00-10:10	<b>Welcome</b> <a href="#">Blair Atholl Room</a>		
10:10-10:55	<b>Keynote Lecture</b> <i>Ideas from Physics Education Research to change your classroom</i> James de Winter, Universities of Cambridge and Uppsala  <a href="#">Blair Atholl Room</a>		
10:55-11:40	<b>Workshop 1</b>  <i>Limit Less – improving equity, diversity, and inclusion in physics participation</i>  <b>Heather Earnshaw, Edinburgh Napier University and Martyn Crawshaw, IOP</b>  <a href="#">Blair Atholl Room</a>	<b>Workshop 2</b>  <i>Visualising electric circuits</i>  <b>Stuart Farmer, IOP</b>  <a href="#">Callander Dollar Room</a>	<b>Workshop 3</b>  <i>Improving Secondary Science: Seven recommendations for improving science in secondary schools</i>  <b>Andrew Bailey, IOP</b>  <a href="#">Erskine Fintry Room</a>
11:40-11:55	<b>Refreshments and Exhibitions</b> <a href="#">Wallace Monument Room</a>		



<b>11:55-12:40</b>	<b>Workshop 4</b> <i>Physics Education Research Clubs: bringing education research into the physics classroom</i> <b>Carole Kenrick, IOP</b> Blair Atholl Room	<b>Workshop 5</b> <i>Perimeter Institute – Modelling the expanding universe</i> <b>Drew Burrett, IOP</b> Callander Dollar Room	<b>Workshop 6</b> <i>Forces and Newton’s laws: common misconceptions and how to deal with them</i> <b>Matthew Burke and Jennie Hargreaves, IOP</b> Erskine Fintry Room
<b>12:40-14:00</b>	<b>Lunch and Exhibitions</b> Restaurant and Wallace Monument Room		
<b>14:00-14:15</b>	<b>IOP Physics Teacher Educator Programme</b> <b>Rachel Hartley, IOP</b> Blair Atholl Room		
<b>14:15-15:00</b>	<b>Workshop 7</b> <i>Aye, ye can dae it – health and safety myth busting</i> <b>Gregor Steele, SSERC</b> Blair Atholl Room	<b>Workshop 8</b> <i>Bringing CERN to school</i> <b>Pete Colquhoun, Biggar High School</b> Callander Dollar Room	<b>Workshop 9</b> <i>Using the BEST resources in your physics teaching</i> <b>Tim Browett, IOP</b> Erskine Fintry Room
<b>15:10-16:00</b>	<b>Keynote Lecture</b> <i>Exploring Cosmic Dawn with James Webb Space Telescope</i> <b>Professor James Dunlop, University of Edinburgh</b> Blair Atholl Room		
<b>16:00-16:20</b>	<b>Refreshments and Exhibitions</b> Wallace Monument Room		



Registration and further details are available at: <https://iop.eventsair.com/spt48-2023/>

# 48<sup>th</sup> Stirling Physics Teachers Meeting



25 May 2023  
 Stirling Court Hotel, Stirling, Scotland

## Stirling Meeting Programme Details

### Keynote Lecture

#### **Ideas from Physics Education Research to change your classroom**

**James de Winter, Universities of Cambridge and Uppsala**

For the last 40+ years, the Physics Education Research community has developed a large range of books, research papers and resources designed to understand and improve teaching and learning in physics. This session will provide an overview of the most useful and accessible 'highlights' that might change your physics teaching forever.

Formerly a secondary school physics teacher, James de Winter has led the secondary PGCE Physics course at the University of Cambridge for many years. He is a member of the Physics Education Research Group at the University of Uppsala, Sweden where he is researching the development of beginning and early career teachers. James also works with national physics and science education organisations including the Ogden Trust, Institute of Physics, and Association for Science Education in various roles which he characterises as "being nice to physics teachers for a living".

### Workshop 1

#### **Limit Less – improving equity, diversity, and inclusion in physics participation**

**Heather Earnshaw, Edinburgh Napier University and Martyn Crawshaw, Millburn Academy and IOPS**

Nationally, uptake in Physics is under-represented across various groups. In this session we'll look at what research can tell us about the underlying drivers of these patterns and explore the implications for sustainable and effective actions. After discussion we'll examine some practical strategies and resources to take back to departments.

[Heather Earnshaw](#) is Lecturer in Teacher Education (Physics) at Edinburgh Napier University. Her previous roles have included managing the Improving Gender Balance Scotland programme for Institute of Physics/ Education Scotland, teaching physics in Edinburgh, and generally fretting about who feels physics is 'right' for them.

[Martyn Crawshaw](#) (IOP Scotland Physics Coach) is PT Sciences at Millburn Academy, Inverness. Martyn has spent many years encouraging a more diverse range of students to study physics and often seeing potential in some learners that is not fully realised.

### Workshop 2

#### **Visualising electric circuits**

**Stuart Farmer, IOPS**

The workings of electric circuits involve many abstract ideas. In this hands-on workshop Stuart will draw on research and experience to explore how to make the invisible more concrete for learners. This will include how to make the most of modelling charge, current, potential difference, resistance, and series and parallel circuits. Participants will be given resources to take away with them to replicate activities in their own classrooms.

Stuart Farmer is Learning and Skills Manager for the Institute of Physics in Scotland. Prior to this he taught physics in Scottish schools for over three decades, was an IOP Teacher Network Coordinator, and has organised and delivered a wide range of physics CLPL.

### Workshop 3

#### **Improving Secondary Science: Seven recommendations for improving science in secondary schools**

**Andrew Bailey, Grove Academy and IOPS**

Drawing on Education Endowment Foundation reports and other sources, this session will explore how research-informed improvements can be made in science classrooms.

Andrew Bailey is a physics teacher and IOP Physics Coach based in Dundee.

### Workshop 4

#### **Physics Education Research Clubs: bringing education research into the physics classroom**

**Carole Kenrick, IOP**

How can we support physics teachers to access, engage with and apply education research that is relevant to them? Last year Carole piloted an online Physics Education Research Club, which focused on a different topic each half term – maths, literacy, equity, cognitive science, and SEND. In this session she will share how she set up and ran the club and provide an overview of key take aways and the impact on participants and their students. You will also come away with ideas and resources for running your own PER club.

Carole is an experienced physics specialist science teacher in both primary and secondary, and has a decade's experience training teachers, including for the Institute of Physics, Ogden Trust, Teach First, and STEM Learning. She is particularly passionate about evidence-informed pedagogy, equity in science education, and building partnerships between teachers and schools. Carole is currently teaching physics part-time in east Kent and working for the IOP, supporting teachers of physics to use evidence to inform their practice. Alongside this she has been running Kew Gardens' first family science club, set up an Eco Club at her school, and is learning aerial hoop (which is great fun and also full of physics!).

### Workshop 5

#### **Perimeter Institute - Modelling the expanding universe**

**Drew Burrett, Stewarton Academy and IOPS**

Models are used extensively in physics teaching to aid understanding of abstract concepts and where 'hands on' practical work may not be possible. This session will look at how models can be introduced, developed, and evaluated. It includes an opportunity to participate in a 'hands on' task using a simple physical model to gather quantitative data relating to the expansion of the universe. Delegates attending this session will receive materials to conduct this task in their own teaching.

Drew Burrett is a physics teacher and IOP Physics Coach based in Ayrshire. Now in his 10th year of working with IOP, he has delivered an extensive range of CLPL sessions both in person and online. He is a regular contributor and admin of the IOP Sputnik email forum.

# 48<sup>th</sup> Stirling Physics Teachers Meeting

25 May 2023

Stirling Court Hotel, Stirling, Scotland



### **Workshop 6**

#### **Forces and Newton's laws: common misconceptions and how to deal with them**

**Matthew Burke, Lochaber High School and IOPS and Jennie Hargreaves, Lockerbie Academy and IOPS**

In this workshop we will focus on common misconceptions about forces and Newton's laws that students may have. We will discuss work using the Force Concept Inventory on how to identify these misconceptions and provide strategies for addressing them in the classroom. We will also explore hands-on activities and demonstrations that can help students better understand these concepts and apply them to real world situations. By the end of the workshop, participants will have gained a deeper understanding of how to effectively teach forces and Newton's laws and be better equipped to help their students overcome any misunderstandings they may have.

Jennie Hargreaves is a physics teacher and IOP Physics Coach based in Dumfries and Galloway. She has extensive experience developing innovative teaching and learning materials and projects to enthuse young people to study physics. This has resulted in her attending conferences as far afield as Hungary, Portugal, and the USA to share her enthusiasm for teaching physics.

Matthew Burke is a physics and engineering science teacher and IOP Physics Coach based in Fort William.

#### **IOP Physics Teacher Educator Programme**

**Rachel Hartley, IOP**

In this short session Rachel will give a brief overview of the pilot of the programme.

Rachel Hartley is the IOP's Strategi Lead for Pedagogy and Professional Practice

### **Workshop 7**

#### **Aye, ye can dae it – health and safety myth busting**

**Gregor Steele, SSERC**

SSERC has supported teachers with safe and effective practical work for almost 60 years.

Gregor Steele needs little introduction to physics teachers in Scotland. For many years he was the lead physics specialist and radiation protection adviser at SSERC.

### **Workshop 8**

#### **Bringing CERN to school**

**Pete Colquhoun, Biggar High School**

In this workshop Pete will demonstrate a range of activities that can be utilised within the classroom that will help you to deliver engaging lessons on particle physics for your learners. This will include building a salad bowl particle accelerator and a Gauss rifle magnetic linear accelerator, using a Lascells cloud chamber to visualise atomic particles, and how to create a particle zoo using simple arts and crafts materials. Participants will be given resources to take away with them to replicate activities in their own classrooms.

Pete Colquhoun is Faculty Head of Science at Biggar High School and also works as an Associate Regional Trainer and Verifier for the Young STEM Leader Programme led by SSERC.

### **Workshop 9**

#### **Using the BEST resources in your physics teaching**

**Tim Browett, Banchory Academy and IOPS**

The Best Evidence Science Teaching resource is a large collection of free resources for secondary school science. The resources have been developed from the best research evidence we can find on common misunderstandings in science, effective diagnostic questioning and formative assessment, constructivist approaches to building understanding, and effective sequencing of key concepts.

Tim Browett is a physics teacher and IOP Physics Coach based in Aberdeenshire.

### **Keynote Lecture**

#### **Exploring Cosmic Dawn with the James Webb Space Telescope.**

**Professor James Dunlop, University of Edinburgh**

Jim will review the huge progress (made with both ground-based and space-based observatories) over the last ~2 decades in our understanding of early galaxy formation. I will then discuss the revolutionary power of the James Webb Space Telescope (JWST) to advance our understanding of cosmic dawn - the creation of the first stars and galaxies in the wake of the Big Bang. Launched on Christmas Day 2021, this long-awaited facility is already transforming our understanding of cosmic history and in particular our view of early structure formation. Jim is Principal Investigator of the largest "Galaxies" JWST program scheduled for observing in JWST Cycle 1, and so will focus in particular about what this major new infrared imaging survey can reveal about the early evolution of our Universe.

Jim is Head of School and Professor of Extra-Galactic Astronomy within the School of Physics & Astronomy at the University of Edinburgh, and also part of the Scottish Universities Physics Alliance. He is an elected Fellow of the Royal Society, of the Royal Society of Edinburgh and of the Institute of Physics, and has previously held a European Research Council Advanced Fellowship and a Royal Society Wolfson Research Merit Award. His research interests are in extragalactic astronomy and cosmology: galaxy formation and evolution, the cosmic history of star formation, the first galaxies and cosmic reionization, and the connection between the growth of galaxies and black holes.

# 48<sup>th</sup> Stirling Physics Teachers Meeting

**25 May 2023**

Stirling Court Hotel, Stirling, Scotland



Stuart Farmer

Stuart is IOP Education  
Manager in Scotland.

## IOP Scotland/SSERC Physics Teachers' Summer School

As in recent years, the Stirling Meeting forms one of the four days of the Summer School which runs from **Wednesday 24<sup>th</sup> – Saturday 27<sup>th</sup> May 2023**.

This residential event also includes a visit to the University of St Andrews for a range of talks, research lab tours, and workshops as well as two days of workshops at SSERC and the nearby Pitbauchlie House Hotel.

The fee for the Summer School is £640 but all teachers from Scottish state funded secondary will receive an Enthuse bursary of £640 as well as free attendance at the IOP Stirling Meeting. As well as the four-day residential experience participants, thanks to IOP Scotland sponsorship, will also receive equipment including a Photonics Explorer kit, additional photonics equipment, and a BeeSpiV light gate totalling well over £200 to then use to replicate practical activities when they return to school.

Apply for a place at:

<https://www.sserc.org.uk/professional-learning/secondary-clpl/physics-clpl/iop-scotland-sserc-physics-teachers-summer-school-2023/>

Successful applicants to the Summer School will have to subsequently register separately for the Stirling Meeting but this will be at no extra cost. If you wish to apply for the Stirling Meeting now to guarantee your place in Stirling, and pay before the early bird deadline, refunds will be available if you subsequently gain a place on the Summer School.

A timetable of the Summer School is below:

### Wednesday 24 May – SSERC

- 10:15-10:30 *Registration and refreshments*
- 10:30-12:30 *Sloan Digital Sky Survey workshop: Simon Reynolds*
- 12:30-13:15 *Lunch*
- 13:15-13:45 *SSERC and YSLP: Graeme Rough/Jamie Menzies*
- 13:45-14:45 *Learning Scientists strategies in the Physics classroom: Drew Burrett*
- 14:45-15:15 *Refreshments*
- 15:15-17:15 *Higher and Advanced Higher experiments on a budget: Norman Bethune/Catherine Dunn*
- Evening *How Do Scientists Think? Stuart Farmer*

### Thursday 25 May – Stirling

Stirling Physics Teachers' Meeting 2023

09:30 *Bus arrival circa*

See timetable on pages 8 and 9

16:30 *Bus departure circa*

Evening *TeachMeet style participant sharing session  
(nano-presentations – 2 min)*



## Friday 26 May – St Andrews

Arrival time, Kennedy Gardens, circa 10:00

- 10:00-10:15 *coffee, comfort break*
- 10:15-10:45 *Relativity, Chris Hooley*
- 10:45-11:15 *Q&A on Relativity, Chris Hooley*
- 11:15-11:25 *short break*
- 11:25-12:10 *Undergraduate student presentations and Q&A*
- 12:10-13:10 *Lunch, with some students and staff from the School*
- 13:10-14:10 *Electronics workshop, Paul Cruickshank*
- 14:10-15:25 *Lab tours*
- 15:25-15:55 *Exoplanet talk, TBC*
- 16:00 *Departure from Kennedy Gardens*
- Evening *Escape Room activities: Jennie Hargreaves*

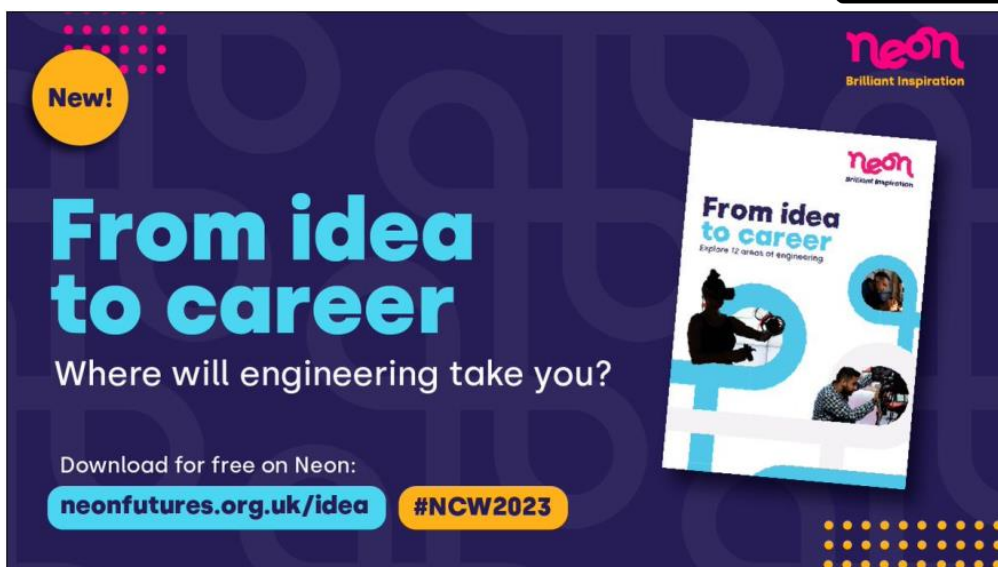
## Saturday 27 May – SSERC

- 09:00-10:00 *What's happening here? Drew Burrett/Tim Browett*
- 10:00-11:30 *National 5 Core Experiments: Jennie Hargreaves/Tim Browett/Matthew Burke*
- 11:30-11:45 *Refreshments*
- 11:45-13:00 *Photonics Explorer workshop: Stuart Farmer*
- 13:00-13:30 *Evaluation and Lunch: Norman Bethune*

## From Idea to Career

New careers booklet about careers in 12 branches of engineering.

<https://neonfutures.org.uk/resource/booklet-from-idea-to-career/>



**New!**

# From idea to career

Where will engineering take you?

Download for free on Neon:

[neonfutures.org.uk/idea](https://neonfutures.org.uk/idea) **#NCW2023**

neon  
Brilliant Inspiration

From idea to career  
Explore 12 areas of engineering

# Limit Less Inclusive Schools Month

March 2023 – part of the Limit Less campaign to inspire more young people to change the world and fulfil their potential by doing physics.

Across March, we're focusing on helping teachers to make schools inclusive and equitable for all students with new specialist teaching resources and events. **At [iop.org/InclusiveResources](https://iop.org/InclusiveResources) you will find a new evidence-led resource - Top Tips for Inclusive Science Teaching** - which offers practical advice on making teaching, interactions and classrooms as inclusive as possible. There's an accompanying Inclusive Science Teaching poster to go with it.

The booklet supports physics teachers with practical ways to make teaching, interactions and classrooms as inclusive as possible. It's structured as nine guiding principles for inclusive teaching, arranged under the three themes of:

- Creating an inclusive culture
- Making the learning relevant
- Building literacy and numeracy for science

Please do share the link to the new resources far and wide with those who you know will benefit from them. We are eager to understand how they are being used, the impact they are having, and for educators to use our new [Talk Physics forum](#) on the topic of inclusive teaching for discussion. We will also be running events on the new resources over the month, so keep an eye on IOP social media for details.

Throughout the month, we're also calling on teachers to sign up to the Limit Less manifesto for change and asking them to encourage their head teachers, rectors, deputies and other members of SLT to follow suit.

This is how we believe we can show our politicians the widespread support that exists for improving equity and inclusion across the education sector.

[Sign up to the Limit Less manifesto here.](#)

The March 2023 edition of Classroom Physics [Classroom Physics | IOPSpark](#) is devoted to Limit Less and inclusion.



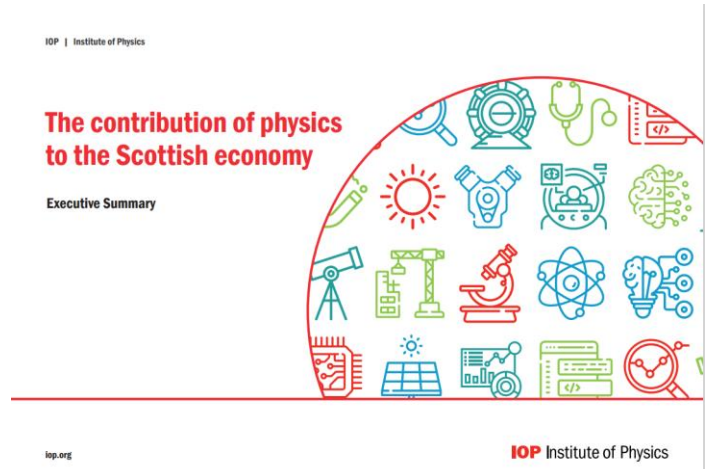
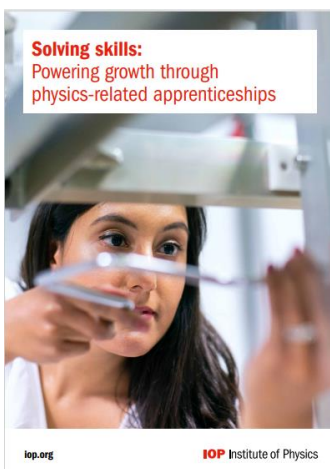


# Information about careers in the STEM subjects

IOP, through its Challenge Fund has supported Planet Possibility [Explore the world of physics | Planet Possibility](#) who are producing careers videos as part of their work, see [FF Infinity #PlanetPossibility on Vimeo](#).

The IOP's Careers website [Careers with physics | Institute of Physics \(iop.org\)](#) links to various pages which include case studies of people with a wide range of backgrounds and career paths including vital apprenticeships and technical routes as illustrated in this recent report [IOP-Solving-Skills-report.pdf](#). See [Physics apprenticeships | Institute of Physics \(iop.org\)](#) for a video including Emily an apprentice from Edinburgh and [Choosing physics: A-levels, Highers and Leaving Cert | Institute of Physics \(iop.org\)](#) for a number of case-studies. The Limit Less campaign to increase equity, diversity, and inclusion in the physics community and beyond includes resources to download [Limit Less careers resources | Institute of Physics \(iop.org\)](#)

For lots of information about the contribution of physics to the economy see [Physics and the Economy – 2022 findings | Institute of Physics \(iop.org\)](#) and [IOP contribution of physics to the Scottish economy summary](#).



# Step Into Physics

IOP has worked in partnership with ESP to produce the [Step into Physics](https://esp-scotland.ac.uk/step-into-physics/) website to provide career information about physics opportunities, particularly through more vocational routes. Recent research has shown that 53% of physics-based jobs do not require a degree and that although physics-based industries make up 8% of the economy they contribute 16% of GDP, and average salaries are well above the national average. Industries also report widespread physics skills shortages which put economic growth and wellbeing as well as our ability to meet key targets, such as reaching net-zero, at risk. Addressing these issues overlaps with IOP's work on our Limit Less campaign and other work in the skills area, for example, only 8% of apprentices in the energy sector are female.

Visit the Step into Physics website at <https://esp-scotland.ac.uk/step-into-physics/>, and also the related ESP websites <https://esp-scotland.ac.uk/step-into-renewables/>, <https://esp-scotland.ac.uk/step-into-science/>, and <https://esp-scotland.ac.uk/step-into-robotics/>.

We would also like to expand the range of videos available on the website so if you know of any potential contributors, especially those who have followed apprenticeship or other FE or more vocational routes into a physics career then please contact [stuart.farmer@iop.org](mailto:stuart.farmer@iop.org).



## STEP INTO PHYSICS

### WHY PHYSICS?

Studying physics provides the stepping stone into rewarding careers in a wide range of industries including; the growing Scottish space sector, renewable energy, medical physics, and photonics where light is used in telecommunications, sensing, medicine and many other applications. Knowledge of physics provides practical skills and problem solving strategies widely sought after by employers.

Demand for physics spans all skills levels. High skill level roles are seeing the fastest growth, with for example, the number of jobs for physical scientists growing by 40% between 2010 and 2020. More than half (53%) of physics based jobs do not require a degree; 46% require intermediate level qualifications such as National 5, Highers and apprenticeships.

Between 2016 and 2021, 66% of physics innovators reported having to suspend or delay business activities because of a shortage of people with physics skills. Recruiting more people with Physics skills will help to increase investment in new and existing physics based industries.

### PHYSICS STATS

Scotland has a total of **27,235** physics based businesses representing 15% of all Scottish businesses.

Physics based businesses employ **220,000** full time equivalent staff in Scotland.

In 2019, physics based industries contributed **£28bn** to the Scottish economy, providing 17% of the total Scottish Gross Domestic Product (GDP).

### UK SALARY RANGES

The average salary of someone employed in a physics based business in Scotland in 2019 was **£47,000**

# SCIENCE ON STAGE

## FESTIVAL

TURKU/FINLAND 12-15 AUGUST 2024

SUSTAINABILITY IN STEM EDUCATION



FROM  
TEACHERS  
FOR  
TEACHERS

450 primary and secondary school teachers from all over Europe share their most creative STEM ideas at stands, in workshops, and in highlight sessions. Participants will be chosen through competitive national events in over 30 countries.

[www.science-on-stage.eu](http://www.science-on-stage.eu)

SCIENCE ON STAGE  
TURKU 2024

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Cooperation partner



# European Science on Stage 2024

The next European Science on Stage festival (#SonS2024) will take place from 12th-15th August 2024 in Turku, Finland. UK teachers from primary and secondary levels will be selected to present their teaching ideas and approaches. Each festival has several guiding themes. For 2024 the themes for all projects are:

- 🕒 *Science for the Youngest*
- 🕒 *STEM Education for Sustainable Development*
- 🕒 *Digital Technologies in STEM education*
- 🕒 *Diversity in STEM Education*
- 🕒 *STEAM in Education*
- 🕒 *Low-Cost Experiments in STEM Education*
- 🕒 *STEM for Teachers in Training*
- 🕒 *Joint projects.*

## What is Science on Stage?

Science on Stage provides a European platform for science and STEM teachers to exchange teaching concepts and to share ideas. The aim of the initiative is to advance science and STEM teaching by creating a platform for science teachers' creativity.

Selected teachers and technicians, from each country, come together for an international festival every two years. At each festival, delegates showcase their winning projects to others from across Europe. They make up the Science on Stage network, sharing good practice and teaching ideas to help raise the overall quality of STEM teaching. Since 2019, ASE has hosted the UK's National Steering Committee (NSC) for Science on Stage UK and is responsible for organising the UK presence at events, supporting the dissemination of practice from the European festivals, and enabling networking with teachers from other countries.

If you'd like to apply, please see further information at <https://www.ase.org.uk/events/science-stage-europe-festival-2024>

To apply, please complete the SurveyMonkey questionnaire at <https://www.surveymonkey.co.uk/r/ScienceOnStage2024>

The deadline for applications is **15th July 2023**. The UK National Steering Committee (NSC) will shortlist applications in the summer of 2023 and successful delegates will be advised in the autumn of 2023.



*The Scottish delegates at Science on Stage 2019 in Cascais, Portugal – Adrian Allan, Martin Hendry, Jennie Hargreaves, David Rigmand, Paul Tyler, and Stuart Farmer.*



# SSERC/STAC Technician STEM Training Day

## 21<sup>st</sup> March 2023

### Full details

SSERC have put together a program that offers you the opportunity to try some activities that you may be new to you, combined with the chance for some professional networking and visit our vendor stalls.

This years session are:-

### Simple Soldering

A session covering simple soldering techniques. Building a circuit and testing solder joints with a multimeter to ensure good technique and understanding.

### Intro to Microbit

This session will look at a BBC microbit and some basic coding to get you started with this powerful minicomputer. How to get started, how to connect the device to a pc and the method for transferring code to the device.

### Basic Circuits/Electrical Theory

A session using basic circuits to describe ohms law and other simple electrical laws. Understanding basic electrical theory is essential for those who perform PAT testing in their school. It also helps in understanding basic electrical experiments within Physics. This session will expand your knowledge on this subject.

### Basic Woodturning

A session covering the basic techniques required for simple turning. Throughout this session you will produce a wooden pen on a standard wood lathe.

### Experiment with Radioactivity

A session covering the safe setup and running of experiments involving radioactivity.

### Building Microscale Chemistry

A session demoing how to build basic microscale chemistry apparatus.

### Introduction to Metal Turning (2 Slots)

A taster session of beginners' metal turning. This two-hour session will give you a basic introduction to metal lathes and metal turning. This will include a hands-on practical of turning techniques.

For application form and programme follow the link:

<https://www.ase.org.uk/events/ssercstac-technician-stem-training-day>

### Venue location

1-3 Pitreavie Court,  
South Pitreavie Business Park,  
Dunfermline,  
KY11 8UU



# Planned in Scotland

**Dawn Gillies**  
**Education Coordinator (Scotland)**  
**Royal Society of Chemistry**



## Funding to help improve science teaching in your area

How could £600 (€690) help support your science teaching community? You can tackle teaching challenges, extend your professional network or organise a collaborative event with our Empowerment Fund grants for primary and secondary teaching. Funding may be used towards projects that:

- Support teachers at schools in hard-to-reach areas
- Help teaching staff to plan for a curriculum change
- Build teachers' confidence in teaching science
- Enable educators to build on their practical experience, become confident outside their specialist area, or work on improving their well-being

Find out more and apply to the Empowerment Fund

Primary teaching <https://edu.rsc.org/.../primary-science-teaching...>

Secondary teaching <https://edu.rsc.org/.../chemistry-teaching-empowerment...>

**In order to apply, you must first sign up for a (free) Teach Chemistry account.**



## Science Teaching Survey 2022

The results from The Science Teaching Survey 2022 can be found here: [rsc.li/tsts-2022](https://rsc.li/tsts-2022). Notable data from Scotland includes:

- Understaffing, lack of funding, quantity of content and student behaviour are key challenges.
- 12% of teachers in Scotland plan to leave the profession in the next five years for reason other than retirement

## Excellence in Education

Nominations opening 27<sup>th</sup> March for Excellence in Education Prizes: Our Excellence in Education Prizes celebrate educators in primary, secondary, further education and higher education – including, teachers, technicians and more. These prizes recognise a wide range of skills – from curriculum design to effective teaching, and from personal development to working culture. There are specific prizes for teams and for those in the early stages of their career. Find out more <https://www.rsc.org/prizes-funding/prizes/>





## Chemistry for Science Teacher courses

We will soon be recruiting for our next round of fully funded Chemistry for Science Teacher courses which will start in **June and September 2023**. The courses will support practical skills, enhance pedagogical subject knowledge and offer teaching strategies. We'll explore common misconceptions, help you contextualise tricky topics and provide links to classroom-ready resources. Each course has 4 sessions.

We are running Part 1 and Part 2 intensive courses starting in June and Part 1 and Part 2 (these will run once a month) starting in September.

**Part 1** will include topics such as supporting good practical chemistry, reactivity of metals, electrolysis and quantitative chemistry.

**Part 2** will include identifying unknown chemicals, equilibrium, rates of reactions and exciting demonstrations.

Here are the dates for the courses starting in June:

**Part 1** – intensive over 4 days in one week Monday 12th- Thursday 15th June, 3.15-5pm

**Part 2** – intensive over 4 weeks on Tuesday's at 13th, 20th, 27th June and 4th July, 6.45-8.30pm

Register your interest so we can contact you when course registration opens.

<https://www.smartsurvey.co.uk/s/SPDEOIJuneandSept2023/>



# Membership Sign Up

## Science Department (11-19)

Save your school up to £250 per year on individual memberships.

Scan QR code or tap the URL below.



<https://www.ase.org.uk/member-ship-sign-science-department>

ASE Science Department membership can help support the entire science team in any secondary school or FE college. For example, trainee and early-career teachers will be able to develop their careers through access to our extensive range of *live CPD events* and recorded webinars, while heads of science might benefit from strategic-level materials such as our *Good Practical Science guidance* or *Best Practice Guidance Documents*.

For just **£250 per year**, science departments are granted five individual logins (additional logins can be added for £30 per user), with registered users able to enjoy benefits such as:

- Member discounts of up to 50% on all ASE CPD events (including online), such as our annual conference - traditionally the largest gathering of science education specialists in Europe
- Access to recorded video CPD materials through our member-only *secondary CPD Video hub*
- Physical copies and digital archive access to our leading primary journal *School Science Review* (1x physical copy per school - UK only)
- Physical copies and digital archive access to our leading primary journal *Education in Science* (1x physical copy per school - UK only)
- A wealth of digital teaching/department resources such *BEST STEPS* or our *Science Department Scenarios*
- Market-leading technician-facing resources such as *Topics in Safety*, and the *Prep Room Organiser*
- Up to 50% the vast majority of ASE & Millgate publications at *Millgate*.

If you get your science department to sign up, you get your next year's individual membership for free!

## Primary membership

ASE primary membership provides teaching resources and professional development opportunities to support primary science subject leaders, teachers and schools.

Scan QR code or tap the URL below.



<https://www.ase.org.uk/content/membership-sign-primary>

For just **£149 per year**, schools are granted eight individual logins, with registered users able to enjoy benefits such as:

- Member discounts of up to 50% on all ASE CPD events, including our four-day annual conference - traditionally the largest gathering of science education specialists in Europe
- Access to recorded video CPD materials through our member-only Primary CPD Video hub
- Physical copies and digital archive access to our leading primary journal *Primary Science* (1x physical copy per school - UK only)
- Physical copies and digital archive access to our leading primary journal *Education in Science* (1x physical copy per school - UK only)
- The *Primary Science Leaders' Survival Guide* (Online resource)
- A wealth of teaching resources such *PLAN*, *Primary upd8* and the *Primary Remote Learning Resources*
- Up to 50% off ASE & Millgate publications at *Millgate*.



# Student Teacher & Early Career 3 Year Option

We want you to be able to enjoy the support and benefits that being part of our network and community bring, and are delighted to be able to give our student teacher & early career members a special three-year offer, at a significantly discounted rate of **£136 for three years** (charged at £24, £44 and £68 in years 1-3 respectively or as a single one-off payment). If you feel a three-year membership option might not be for you, we also offer a one year plan for £70 for the year instead.

## Some of the benefits trainee and early career members receive include:

- Priority access to ASE webinars as well as to our popular *Teachmeets*.
- Big discounts on professional development, from hands-on *workshops*, to our flagship *Annual Conference* (including one free day per year at any ASE CPD event during your three year plan)
- Access to early-career member online sessions providing opportunities to ask questions and share concerns & best practice.
- ASE Journals and full access to our *journals archive online*.
- Secondary members will also get online access to *School Science Review*, our leading peer reviewed journal; Primary members will get online access to our leading *Primary Science* journal.

Scan QR code or tap the URL below.

<https://www.ase.org.uk/individual-membership>



## Professional Registration

The ASE is licensed by the Science Council to manage professional awards, which recognise excellence for practitioners in science education:

- **RSci** (Registered Scientist Award), which benefits all those concerned with science teaching as a profession;



<https://www.ase.org.uk/rsci>

- **RSciTech** (Registered Science Technician Award), which benefits all those concerned with science education, and



<https://www.ase.org.uk/rscitech>

- **CSciTeach** (Chartered Science Teacher Award), which benefits all those concerned with science teaching as a profession.



<https://www.ase.org.uk/csciteach>

These can be awarded to eligible members. If you are not yet a member of ASE, you can click on the above QR code, that applies to you, in the membership section.