international ORKNEY SCIENCE FESTIVAL

Secondary Schools Programme 2024

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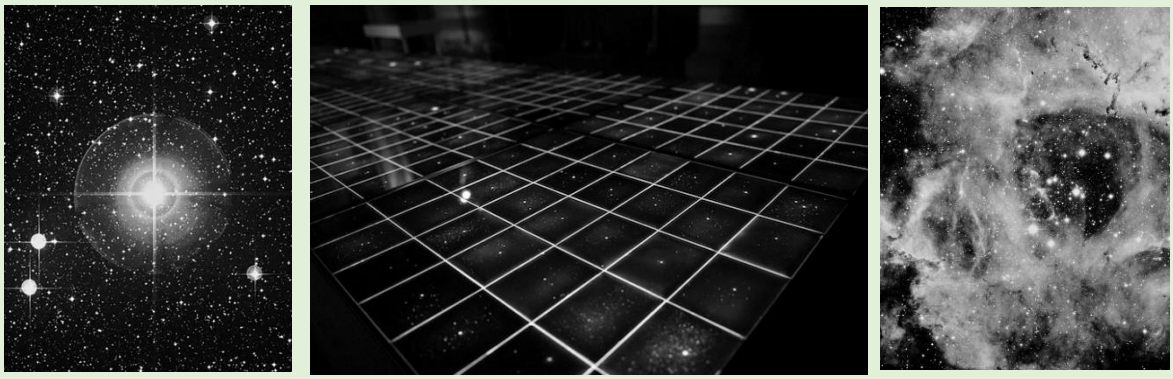
An Imperfect Account of a Comet

Orkney International Science Festival is please to invite you to join us in Lynda Laird's audiovisual installation celebrating the celestial discoveries of the 18th century astronomer Caroline Herschel in St. Magnus Cathedral throughout the festival: 5th – 11th September 2024.

The work is presented as 560 photographic glass plates of stars that Herschel noticed were missing from the British Star Catalogue and serves to bring these 'omitted' stars to light. As such, they represent all the women whose groundbreaking knowledge and wisdom has been overlooked, undervalued, and ignored throughout history.

During her lifetime, Herschel also discovered 8 comets and 14 nebulae, which are acknowledged in an accompanying sound composition, '8 Comets'. The music was written and produced by Phil Tomsett, recorded by Annie Needham and read by Daniela Roberts. *N.B.: The project funding is still to be agreed, so please do make your booking and we will confirm closer to the date.*



RAS Bicentennial Quilt

The Royal Astronomical Society (RAS) created a "Bicentennial Quilt" for its anniversary in 2020, with 100 patchwork squares on astronomical themes. With the support of Callum Potter, a former Society president who now lives in Orkney, we will display the quilt in Saint Magnus Cathedral.

How to Book a Visit to the Comet Installation and RAS Bicentennial Quilt

We are able to offer school groups an opportunity to visit the Comet Installation and RAS Bicentennial Quilt during the Festival period. There will be a package of some art/science activities during their visit i.e., printing with cyanotypes (a photographic process, invented by Caroline's nephew John Herschel), comet and constellations making. The visits will be scheduled every morning and afternoon on Thursday 5th, Friday 6th, Monday 9th, Tuesday 10th and Wednesday 11th September.

We will provide special (FREE) packages to schools, especially from outer islands of Orkney and areas of high deprivation, to visit the Comet Installation and subsidies will be available to cover travel costs to the venue. Booking required!

Please complete the following booking form: https://bit.ly/3U1QJIT.

Alternatively, please email your enquiries with the following information to a.wright@oisf.org and Alexandra Wright, our Schools Programme Coordinator will be in touch:

Name of School

Class(es) and number of pupils (for each session)

Preferred date/time and list alternative date(s)/time(s) in order of preference.

Teacher name and contact details (email and phone)

Aurora from the ISS and Jupiter from Juno by Morag Potter

Visit to An Imperfect Account of a Comet Installation and RAS Bicentennial Quilt at Orkney International Science Festival is supported by:

Science and Technology Facilities Council

Royal Astronomical Society

THISTLE WIND PARTNERS

Secondary School Programme – How to Book

We're thrilled to offer again a variety of in-person and online sessions for this year's School's Programme.

Please complete the following booking form: https://bit.ly/3U1QJIT

Alternatively, please email your enquiries with the following information to a.wright@oisf.org and Alexandra Wright, our Schools Programme Coordinator will be in touch:

- Name of School Class(es) and number of pupils (for each session)
- Preferred date/time and list alternative date(s)/time(s) in order of preference.
- Teacher name and contact details (email and phone)

Whaletalk by Scottish Association for Marine Science

Suitable for: S1-S6

Available to Book: Monday 9th, Tuesday 10th & Wednesday 11th September

Length of Session: 1 hour

Of all the creatures in the marine environment, whales and dolphins are among the most recognisable and best-known. However, we rarely get a glimpse into their underwater world. We can't necessarily see marine mammals in their deep underwater habitat, but we can listen. Underwater acoustic technology helps scientists to identify species and their location and reveals patterns of behaviour and migrations. As humans develop technology to further exploit the ocean's natural resources, can we learn more about the behaviours of these creatures by listening more?

Whaletalk, our current research campaign, strengthens the case for long-term monitoring of marine mammals and helps to raise public awareness of marine mammal sounds and behaviours in Scottish waters.

Building a RoboNation! By The National Robotarium

Suitable for: S3-S6

Available to Book: Monday 9th September

Length of Session: 90 minutes

Learn more about the real-world projects that the National Robotarium undertakes and the different robotic systems that help us solve the problems of tomorrow with the technology of today. Get hands on with some of our robotic kits to engineer solutions to our session's challenge.

Explore the Fascinating History of Astronomy: from Stonehenge to Telescopes by Vassilios Spathopoulos

Suitable for: S1 – S6

Available to Book: Thursday 5th, Friday 6th & Monday 9th September

Length of Session: 1 hour

In this engaging workshop, we will immerse ourselves in the captivating world of astronomy. Using models of ancient astronomical structures and instruments, we'll journey through time, uncovering the contributions of different civilisations. Our toolkit comprises replicas of Stonehenge, a Polynesian star compass, an ancient Greek computer, and an astrolabe. The workshop will include a type of hands-on activity such as the construction of a paper sundial or learning how to navigate using the stars. Join me on this celestial adventure as we connect the past with the present, celebrating the rich heritage of human curiosity and scientific exploration.

Mission to the Moon by Cerebral Ape Ltd

Suitable for: S1-S6

Available to Book: Thursday 5th, Friday 6th & Monday 9th September

Length of Session: 1 hour

Participants will learn all about Nasa's plan to build a base on the moon and will have to work as a team to control a robotic rover. They will be tasked with driving it over the surface of a realistic lunar landscape and use their problem-solving skills to complete various challenges.

Shape and Symmetry Workshop by Katie Steckles and Hana Ayoob

Suitable for: S1-S6

Available to Book: Thursday 5th, Friday 6th, Tuesday 10th & Wednesday 11th September

Length of Session: 1 hour

Led by mathematician Katie Steckles and illustrator Hana Ayoob, participants will use rulers and compasses to construct shapes, drawing inspiration from traditional mandala patterns. This creative activity not only provides insight into the underlying mathematical principles of design but also encourages participants to craft their own unique artwork.

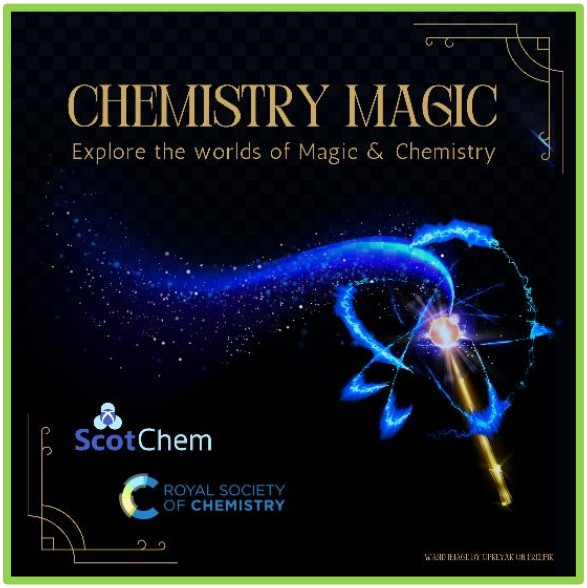
Supported by International Centre for Mathematical Sciences (ICMS) Public Engagement Fund

Science in Magic by Adrian Allan

Suitable for: S1-S6

Available to Book: Thursday 5th & Friday 6th September

Length of Session: 1 hour



From science that appears magical to the science behind the magic, discover magical experiments each offering a new concept to explore. Learn how to shrink your own head, make water vanish from a cup, bend metal with your mind and make a coin pass through a solid object. At the end of the session you will learn how science is used to create magical illusions that amaze and astonish.

Supported by Royal Society of Chemistry Public Engagement Fund.

DigiInventors by Digital Health & Care Innovation Centre (DHI)

Suitable for: S1-S6

Available to Book: Monday 9th, Tuesday 10th & Wednesday 11th September

Length of Session: 40 minutes

Join the Digital Health & Care Innovation Centre (DHI) as we co-design digital innovations for the digital health and care sector and give participants an introduction to the digital, entrepreneurial and STEM skills you require for a career in the digital health and care sector. These 40-minute 'design sprint' sessions will introduce pupils to the #DigiInventors Challenge 2024 which focuses on developing a digital health and care solution that uses SMART Technology to support young peoples' health and wellbeing.

The History Of Galaxies
by Dr Anne-Marie Weijmans (University of St Andrews)

Suitable for: S1 – S6

Available to Book: Thursday 5th, Friday 6th, Monday 9th, Tuesday 10th & Wednesday 11th September

Length of Session: 45 - 60 minutes

In this interactive talk we will explore the history of galaxy observations. We will start with naked-eye observations, and then find out why a French astronomer hunting for comets in the 18th century became so frustrated with galaxies that he compiled one of the first galaxy catalogues. We will explore when we first realized that the Milky Way was just one of many galaxies in the Universe, and the role that the 'Harvard Computers' team (which included Scottish astronomer Williamina Fleming) in the late 19th century played in this discovery. Finally, we will have a look at how we observe galaxies today, both with ground and space-based telescopes, and what the current questions are that astronomers studying galaxies are trying to answer.

Periodic Success by Jamie Gallagher

Suitable for: S1-S6

Available to Book: Friday 6th, Monday 9th, Tuesday 10th & Wednesday 11th September

Length of Session: 45 – 60 minutes

Hidden in the periodic table live tales of romance, murder, greed and wonder. Which element will make you reek of garlic? Why do we love gold? And what is the disgusting secret of antimony? Join material scientist Dr Jamie Gallagher on an interactive and explosive tour of the elemental housing block as we celebrate the Periodic Table.

Kitchen Chemistry by Jamie Gallagher

Suitable for: S1-S6

Available to Book: Friday 6th, Monday 9th, Tuesday 10th & Wednesday 11th September

Length of Session: 45 – 60 minutes

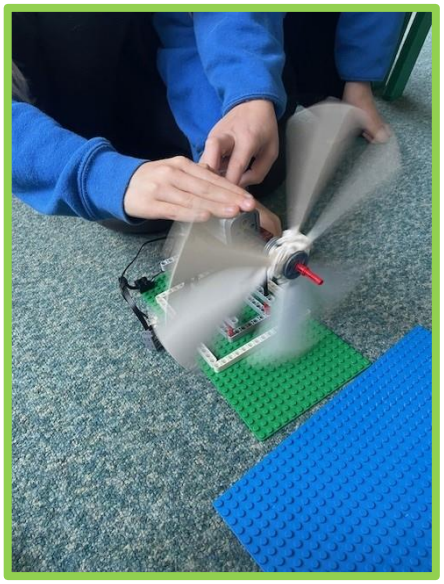
Chemical reactions aren't just bubbling beakers in laboratories – our day to day lives are packed with amazing and overlooked chemical reactions. Take a tour around the kitchen with Jamie Gallagher and explore the sights, sounds and smells of everyday chemistry. Explosive oranges, disgusting cola and the secrets of sugar all lie in wait as we put the 'ordinary' world under a microscope. The kitchen becomes the scientist's playground in this jam-packed show filled with fun experiments guaranteed to make you look at science in a whole new light.

Lego Renewables - Build a Wind Turbine by My World of Work

Suitable for: S1-S2

Available to Book: Thursday 5th & Friday 6th September

Length of Session: 90 minutes



Using LEGO Renewables kit, pupils will be challenged to build their own wind turbine or solar station and find out how renewable energy is changing our world. Students will be able to see electricity produced and improve their models by testing. There is also time to think about fair testing and an element of competition.

This session is suitable for classes of 24 and students will work in pairs.

Cracking Cryptography - Online Session by My World of Work

Suitable for: S1-S2

Available to Book: 9:30-10.30 on Monday 9th, Tuesday 10th & Wednesday 11th September

Length of Session: 1 hour (Online)

Join in this on-line session to explore careers in cyber security and learn how to use a Caesar cipher to crack code. Through a range of fun, code-breaking activities, you will discover how encryption has created jobs in almost every industry around the world. Suitable for whole classes and every pupil requires access to their own device connected to the internet. Different schools can sign up for same session for an element of competition.

Games Design Series – Online Session by My World of Work

Discover what it takes to be a game designer and progress through the Game Design series. There are three levels of activities which have been devised to build on your coding and design skills.

Monday 9th September

Game Design 1: "Maze Maker" - Introduces pupils to software, language and basic coding skills.

Tuesday 10th September

Game Design 2: "The Floor is Lava" - Builds on the foundations learnt in Game Design 1 and teaches pupils to code their own platform game.

Wednesday 11th September

Game Design 3: "The Final Frontier" - Further enhances your programming skills whilst introducing the space industry in Scotland.

To take part, all pupils must have access to a device connected to the internet. Full classes can participate.

Suitable for: S1-S2

Available to Book: 11:00-12:00 on Monday 9th, Tuesday 10th & Wednesday 11th September

Length of Session: 1 hour (Online)

Online Sessions by Ashleigh Kitchiner

- **Marine Mammals in Orkney**
- **Life as a Marine Biologist**

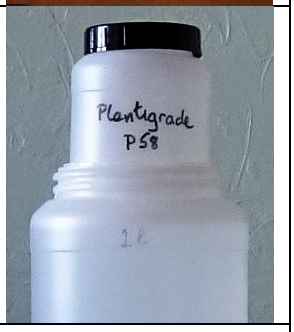
Suitable for: S1 – S6

Available to Book: During the Science Festival, but possibly beyond it

Length of Sessions: 30-45 minutes (Online)

Ocean Discovery Talks for Secondary Students: Embark on a captivating journey tailored for secondary school students! Delve into the fascinating realm of marine biology, uncover the array of career pathways available in the field, and unravel the secrets of globe-trotting with marine-based professions. Get ready to dive deep into the world of marine science!

Competition: Warm Orkney: STEM Projects for the Orkney Science Festival

Design and test hot water tank insulation. [Engineering]	
Test tanks of different sizes. [Maths]	
Add a heat battery. [Technology] Sunamp Heat Batteries™	
Save heat and the planet.	Help Orkney save energy and money.

Free kit for each school.

£60/£30 prizes for the best reports. (Primary and Secondary)

Do any of the three experiments.

Teams of up to 5 pupils can enter the competition.

Teachers to send results to dave.craig@prosper.scot **before the end of term: Tuesday 2nd July**.

A good report is brief, well-presented, and accurate with numbers.

Use diagrams, sketches and photographs. Hand-written or typed - or use spreadsheets. If you use a micro:bit, include your code

Free kit for each school, including a micro:bit temperature sensor, battery box and leads. Ask dave.craig@prosper.scot with a note of approximate class size, and whether you need a v2 micro:bit as well as the leads.