

EDINBURGH INTERNATIONAL
science
festiva



2018 CELEBRATING
30 YEARS
31 MARCH–15 APRIL

EDINBURGH INTERNATIONAL SCIENCE FESTIVAL



Registered Charity no. SC003790

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK BOOKING HOTLINE: 0844 557 2686 #EDSCIFEST

WITH SPECIAL THANKS TO ALL OUR SUPPORTERS

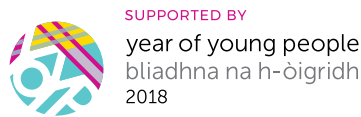
HEADLINE SPONSOR



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LIFE

THE UNIVERSE AND EVERYTHING



CELEBRATING 30 YEARS OF EDINBURGH INTERNATIONAL SCIENCE FESTIVAL

Welcome to Science Festival 2018, the 30th edition of our annual two-week Festival that has been inspiring audiences of all ages since 1989.

This year, we will be exploring the theme of *Life, the Universe and Everything*, contemplating and celebrating the wonder and diversity of life in all its forms, on Earth and beyond, asking where we have come from, where we are going and how science, technology, engineering and mathematics (STEM) can help us sustain our planet for future generations.

And, this year, we are delighted that members of these future generations have shaped our programming like never before. Marking Scotland's Year of Young People 2018 and cementing our commitment to inspiring Scotland's young people with STEM, Science Festival 2018 will feature events programmed alongside our new Youth Consultation Group, who have worked across content, programming, marketing and design on events including *Existence: Life and Beyond* (p.12) at the National Museum of Scotland and the *Edinburgh Mini Maker Faire* (p.31).

New ideas and fresh perspectives are at the heart of what we do and we are deeply committed to equality and diversity across an inclusive Festival programme that aims to reach and inspire audiences of all ages and backgrounds.

Join us from 31 March-15 April for a celebration of life, of our existence and of our potential.

Here's to the next 30 years!

Amanda Tyndall
Festival and Creative Director



HOW TO USE THIS BROCHURE

WHERE TO FIND THE SCIENCE FESTIVAL (P.56–57)

Each Easter, we transform spaces in and around Edinburgh into Science Festival hubs for discussion, debate, experimentation and discovery. In 2018, you'll find our programme of events at City Art Centre, the National Museum of Scotland, Summerhall, Royal Botanic Garden Edinburgh, RZSS Edinburgh Zoo, Dynamic Earth and more.

EVENTS FOR FAMILIES (P.8–31)

Join us for exciting, engaging and educational events and activities the whole family can enjoy. Events are listed by date and then by venue, with recurring events highlighted each day.

Most family events carry a minimum age recommendation and, to ensure the best possible experience for all our visitors, we ask parents to bear these in mind when choosing events for their children.

REDUCED PRICE TICKETS

For our family events that offer a reduced price for three tickets or more, this must include at least one child under the age of 16.

EVENTS FOR ADULTS (P.32–55)

Our programme of events for adults includes discussions, debates, workshops, screenings and nights out, all with a scientific twist. Events are listed by date and then by time.

Most of our adult events are designed for audiences aged 14+, unless an age restriction or guideline is listed. This is a recommendation only and younger audiences are welcome, except where marked. Please note that all events where alcohol is served will be marked AGES 18+ due to licensing restrictions. Under 18s cannot be admitted to these events and proof of age may be required.

USEFUL INFORMATION (P.56–58)

Turn to the back of this brochure for more information about booking tickets, Festival venues and more information about Edinburgh International Science Festival.

CITY ART CENTRE

WORKSHOPS AND ACTIVITIES FOR FAMILIES

Join us at our flagship family venue, right in the heart of Edinburgh. During the Science Festival, we transform City Art Centre's gallery spaces into a sensational science playground for families, packed with workshops, shows and interactive activities.

Discover the wonderful world of bees, create a coral creature, build your own robot or scrub up and try your hand at ER Surgery. Admission to City Art Centre requires a Day Pass, which allows you to explore a mixture of bookable and drop-in sessions and events.

Adults can join in too with Science Festival Lates (p.34) – our opening party celebrating the 30th edition of the Science Festival – where the grown-ups take over our family venue for one very special night!

OPEN SATURDAY 31 MARCH–SATURDAY 14 APRIL (NOT SUNDAYS)

9.30AM–4.30PM

CHECK LISTINGS FOR INDIVIDUAL EVENT TIMES

FACILITIES

City Art Centre has a café on the ground floor and a packed lunch area within the building. There is also a cloakroom and buggy park.

VENUE SPONSOR

Every day, hundreds of millions of consumers worldwide rely on Cirrus Logic audio and voice technology at home, in their car and on their mobile devices. From their headquarters in Austin, Texas and major facilities in Edinburgh, London and Newbury in the UK, Cirrus Logic connects us with the world to deliver a great audio experience. Make your voice heard – through Cirrus Logic Technology.

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NATIONAL MUSEUM OF SCOTLAND

DROP-IN ACTIVITIES, WORKSHOPS AND EXHIBITIONS FOR FAMILIES

One of Edinburgh's most iconic buildings, the National Museum of Scotland houses treasures from around the world, all under one roof. At Science Festival 2018, we're inviting you to explore *Existence: Life and Beyond*, our interactive exhibition in the Grand Gallery celebrating life in all its forms, will include *Event Horizon*, a brand-new installation by renowned artist **Jason Hackenwerth**, as well as two specially commissioned digital installations, hands-on interactives and pop-up events programmed by the Festival's Youth Consultation Group as part of Scotland's Year of Young People 2018.

You'll also find interactive workshops in the Learning Centre and Pop-up Science in Hawthornden Court, featuring an amazing programme of drop-in activities that changes across the Festival. Don't forget to check out the award-winning science and technology galleries!

FAMILY EVENTS FROM THE UNIVERSITY OF EDINBURGH

Discover science with real scientists from The University of Edinburgh. Visit the Learning Centre for family-friendly drop-in activities, bookable workshops and shows.



DISCUSSIONS, DEBATES AND INTERACTIVE EVENTS FOR ADULTS

In the evenings, don't miss our exciting programme of discussions and debates. From the impact of social media on our bodies and lifestyles, to dark matter, genetics and the next steps in tackling climate change through the Paris Agreement, we're exploring a range of key issues.

OPEN DAILY | 10AM–5PM AND EVENINGS FOR EVENTS
CHECK LISTINGS FOR INDIVIDUAL EVENT TIMES

FACILITIES

There are three places to eat within the museum: the Brasserie, Balcony Café and Tower Restaurant. Packed lunches can be eaten in the Group Space in the Entrance Hall and other designated areas. Cloakroom facilities are available.



SUMMERHALL

SHOWS AND ACTIVITIES FOR FAMILIES AND YOUNG PEOPLE, DISCUSSIONS, DEBATES AND INTERACTIVE EVENTS FOR ADULTS

The former Royal (Dick) School of Veterinary Studies in Edinburgh is now a major creative venue for the arts. During the Science Festival, you'll find it packed full of shows, drop-in activities and special events for families during the day and adults in the evenings. There's a whole world of scientific adventure on offer!

Back this year is *The Experimentarium* – a laboratory zone filled with free hands-on activities for all ages (p.24-25) – and the *Edinburgh Mini Maker Faire* (p.31) will once again take over the whole venue on Sunday 15 April.

Our contemporary art exhibition, *Synthetica* (p.35), co-curated by Edinburgh International Science Festival, Summerhall and ASCUS Art & Science, runs throughout the Festival, and Blackwell's pop-up bookshop will be open every day in the courtyard chalet.

OPEN DAILY | 11AM–11PM, SEE LISTINGS FOR EVENT TIMINGS
CHECK LISTINGS FOR INDIVIDUAL EVENT TIMES

FACILITIES

Food and drink is available throughout the day at the Summerhall Café and from noon–9pm at The Royal Dick Bar.

Please note: Summerhall is a B-listed venue and although reasonable adjustments have been made to the venue in order to provide access to customers with disabilities, we regret to say that the Dissection Room and Red Lecture Theatre are only accessible by the stairs. Full details are available at summerhall.co.uk.



VENUE SPONSOR

Baillie Gifford is delighted to support the Science Festival's hub, Summerhall. Headquartered in Edinburgh, Baillie Gifford has a significant global presence, managing investments on behalf of pension funds, financial institutions, charities and retail investors. The firm is proud to play an active role in its community by supporting a diverse variety of projects across festivals and the arts, education and social inclusion.

bailliegifford.com



Investment managers



ROYAL BOTANIC GARDEN EDINBURGH

INTERACTIVE ACTIVITIES FOR FAMILIES

The Botanics is a world-renowned centre for plant science and education, aiming to explore, conserve and explain the world of plants for a better future. At Science Festival 2018, working with sister research organisations in the



SEFARI (Scottish Environment, Food and Agriculture Research Institutes) collective, a programme of family-friendly activities will explore the nature and food of Scotland.

Also look out for a programme of events introducing the #Pianodrome, a new amphitheatre space created entirely from discarded pianos, that will be built in the Botanics by artist **Tim Vincent-Smith** and his team in Summer 2018.

OPEN DAILY | 10AM–6PM
CHECK LISTINGS FOR INDIVIDUAL EVENT TIMES

FACILITIES

The Botanics has three on-site catering facilities – the Gateway Restaurant, the Terrace Café and the East Gate Coffee Bar.



Royal
Botanic Garden
Edinburgh

RZSS EDINBURGH ZOO

INTERACTIVE ACTIVITIES FOR FAMILIES

Edinburgh's world-class Zoo is set in 82 acres of sloping parkland, three miles to the west of the city centre. Go wild at the Zoo this Easter and discover a range of Science Festival events, activities and exhibitions in addition to all the usual animal antics!

OPEN DAILY | 10AM–6PM
CHECK LISTINGS FOR INDIVIDUAL EVENT TIMES

FACILITIES

The Zoo has a wide range of eating options, several play areas and a gift shop.





DYNAMIC EARTH

INTERACTIVE EVENTS FOR FAMILIES

Discover a world of incredible experiences at Dynamic Earth. Embark on the interactive adventure of a lifetime as you travel through space and time in our immersive and multisensory exhibition; blast through space in a time machine, feel the Earth move beneath your feet, get your hands on a real iceberg, go on a 4D adventure across our planet and soak up the atmosphere of a tropical rainforest.

During the Science Festival, you can meet scientists who have worked in different environments all across our planet, take part in exciting hands-on experiences, go on an outdoor adventure or blast off into the depths of space in a digital planetarium, and so much more.

OPEN DAILY | 10AM–5.30PM (LAST ADMISSION 4PM)
CHECK LISTINGS FOR INDIVIDUAL EVENT TIMES

FACILITIES

Dynamic Earth has an on-site café, a gift shop, cloakroom facilities and underground parking is available.



AROUND EDINBURGH

DISCOVER SCIENCE AROUND THE CITY

As well as our core venues, you'll find a vast and varied selection of events during the Festival at venues around the city and beyond – the perfect solution for a great scientific day (or night!) out.

Look out for the Around Edinburgh section in the family section of this brochure and individual events in the adult programme.

You'll find more information on our website at sciencefestival.co.uk/venues.

A FULL VENUE LIST IS AVAILABLE ON P.56–57
CHECK LISTINGS FOR INDIVIDUAL EVENT TIMES



EDINBURGH INTERNATIONAL SCIENCE FESTIVAL
POWERED BY EDF ENERGY

EDF Energy is proud to power Edinburgh International Science Festival and its *Generation Science* primary schools touring programme, a headline partnership that is part of our wider commitment to science, technology, engineering and maths (STEM) education in Scotland.

As well as being Scotland's largest producer of low carbon electricity, EDF Energy is investing in engaging and inspiring the next generation of Scottish minds, encouraging them to think about the wealth of STEM careers available because we know that if Scotland is to address the energy challenges of the future, it needs to have a workforce with strong skills in STEM.

EDF Energy's hugely successful education platform, *The Pod* (jointhepod.org), gives more than 1,500 teachers access to interactive resources exploring energy, waste, biodiversity and climate science. We also run the *Pretty Curious* programme of workshops which inspire girls to consider STEM subjects and careers.

Each year, we also welcome thousands of schoolchildren through the doors of our visitor centres at Hunterston B and Torness, where our guides talk them through how electricity is made before taking them on a tour of the heart of the power station.

During the Science Festival you'll find us at the *Ecoville* low carbon village at the Mound Precinct; we'll also be running a brand-new workshop at City Art Centre, using littleBits™, an interactive introduction to circuits. And, we'll be at Summerhall on Sunday 15 April as part of the fantastic Science Festival finale that is the *Edinburgh Mini Maker Faire*.

We hope you and your family have a great Festival, that leaves you excited and inspired by STEM.

THROUGHOUT
THE FESTIVAL

AROUND EDINBURGH

STREET SCIENCE

ALL AGES
WORKSHOP



TIMES VARY | DROP-IN

VARIOUS DATES THROUGHOUT THE FESTIVAL

FREE | AROUND EDINBURGH

With mind-boggling experiments and dazzling science demonstrations, our busking bikes take street performance to a whole new level. Witness explosions, weirdness and plenty of mess. Look out for our *Street Science* team around town during the Science Festival and follow us on Twitter @EdSciFest for real-time *Street Science* updates.

Supported by



BOOKABLE
WORKSHOPS
SCHEDULE

Many of our events are available to drop into during your visit. However some workshops have a limited capacity and should be booked in advance. You can reserve up to three bookable workshops per child's Day Pass purchase. Please use the schedule below to plan your day. We would ask you to keep this schedule and the minimum age recommendation in mind when selecting workshops for your child.



SATURDAY 31 MARCH...

CITY ART CENTRE



9.30AM-4.30PM | ALLOW 4-5 HOURS FOR YOUR VISIT | SATURDAY 31 MARCH-SATURDAY 14 APRIL (NOT SUNDAYS)
 £8 ADULT | £9.50 CHILD AGED 7+ | £7 CHILD AGED 3-6 | FREE CHILD UNDER 3 | £5 DISABLED | £5 REGISTERED UNEMPLOYED
 (FOR EACH FAMILY MEMBER UP TO 6 PEOPLE, ID REQUIRED)

During the Science Festival we transform Edinburgh's City Art Centre into a science playground packed full of workshops, shows and interactive events.



EARLY BIRD OFFER

Book over the phone or in person before Tuesday 27 February and get £1 off all Day Passes on Saturday 31 March, Monday 2 and Tuesday 3 April.

HOW TO BOOK YOUR CITY ART CENTRE DAY PASS

A Day Pass gets you into City Art Centre to explore as many events as you like. The events are a mixture of bookable and drop-in sessions. Pre-booking your Day Pass and a selection of bookable events is strongly advised to avoid queues and disappointment.

You can browse the events at City Art Centre below. When you're ready to book your tickets you can add a selection of bookable activities to eligible child day passes. Drop-in activities don't need to be reserved and can be enjoyed by all the family throughout the day.

Please note: when attending City Art Centre, children must be accompanied by an adult and unfortunately we do not issue tickets to lone adults. If you would like to discuss large group bookings for City Art Centre please call our Box Office on 0844 557 2686 and they will be happy to help you plan your visit.

GIFT AID SCHEME

The Edinburgh International Science Festival Foundation, which runs Edinburgh International Science Festival, is an educational charity and all ticket prices for City Art Centre events include a 10% donation. This allows us to reclaim the tax you pay to visit through the Gift Aid Scheme; every pound you pay is worth £1.25 to us. These donations help make the Science Festival accessible to those on lower incomes. If you are not a UK taxpayer or do not wish to make a charitable donation, the admission prices for the City Art Centre are as follows: £7.20 adults/ £8.65 child aged 7+ / £6.36 child aged 3-6.

giftaid it



CARNIVAL OF THE MIND



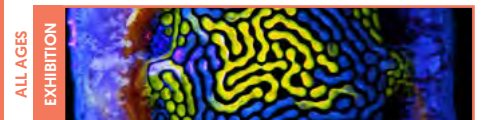
DROP-IN

Roll up, roll up and step inside the *Carnival of the Mind* to discover the secrets of your brain! Visit our fortune teller to explore your frontal lobe; take a turn on the high striker to uncover how you process pain; learn about vision at our coconut shy. It's all the fun of the fair but with some added science!

Supported by



INTERNATIONAL IMAGES FOR SCIENCE



DROP-IN

The Royal Photographic Society brings its exciting new exhibition to the Science Festival. Supported by Siemens as part of the *Curiosity Project*, the exhibition includes amazing images of everything from frozen bubbles and floating safety pins to galaxies and microscopic creatures. Follow the discovery trail and find the key photos for your chance to win a Nikon camera!

Image: Ella Main

AGE	START TIME	10.00	10.30	11.00	11.30	12.00	12.30	1.00	1.30	2.00	2.30	3.00	3.30	4.00	4.30
3+	LITTLE GIANTS 20 MINS	█	█	█	█	█	█	█	█	█	█	█	█	█	
5+	DIG UP A DINOSAUR 45 MINS	█	█	█	█	█	█	█	█	█	█	█	█	█	█
5+	LITTLE SPARKS 45 MINS	█	█	█	█	█	█	█	█	█	█	█	█	█	█
5+	SPLAT-TASTIC 20 MINS	█	█	█	█	█	█	█	█	█	█	█	█	█	█
7+	MINI MECHANICS 20 MINS	█	█	█	█	█	█	█	█	█	█	█	█	█	█
7+	UNWRAPPING THE MUMMY 45 MINS	█	█	█	█	█	█	█	█	█	█	█	█	█	█
8+	CREATIVE LITTLEBITS™ CIRCUITS 45 MINS	█	█	█	█	█	█	█	█	█	█	█	█	█	█
8+	ER SURGERY 45 MINS	█	█	█	█	█	█	█	█	█	█	█	█	█	█
8+	ROBO CONSTRUCTORS 45 MINS	█	█	█	█	█	█	█	█	█	█	█	█	█	█

BOOKING HOTLINE: 0844 557 2686

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK

CITY ART CENTRE

SCIENCE MINI CINEMA



ALL AGES
ACTIVITY

DROP-IN
Sit down, relax and enjoy our *Science Mini Cinema* where you can observe our world in a bit more detail, from slow motion to time lapse, as we explore *Life, the Universe and Everything* through a series of short films.

MARS MASTER CONSTRUCTORS



ALL AGES
ACTIVITY

DROP-IN
Humanity's first Mars colony needs your help! What do we need for a new life on Mars? Help out building pods, buildings, labs and anything else you decide is important. Our team have started with the first building, but the rest is down to you for a successful move to our new home planet.

ZOOM BOX



ALL AGES
ACTIVITY

DROP-IN
Zoom in, it's time to get up close with the world around you! Use your smartphone camera with our special microscope tables to get a closer look at our scientific samples. Head upstairs to create your own *Zoom Box* and pair it up with your smartphone camera to create a super strong microscope for you to take home.

LITTLE GIANTS



AGES 3+
WORKSHOP

10AM-4PM (HALF HOURLY) | 20 MINS
Buzzy, the giant honeybee, leads you into the wonderful world of bees in this delightful, interactive show. Learn how a bee's body is different from ours and find out how bees and flowers work in harmony together. Take a tour of a beehive, make pretty pollen trail patterns and suck up nectar just like a real-life bee.

WEE WONDER WORLD



AGES 3+
ACTIVITY

DROP-IN
Take a fascinating journey through our special space for smaller scientists. Explore why things float, enjoy story time with a scientific twist, construct a tremendous tower, build your own spinning toy or create a musical instrument. It's all possible with some simple science!

DIG UP A DINOSAUR



AGES 5+
WORKSHOP

10AM-4PM (HALF HOURLY) | 45 MINS
Ready to uncover dinosaur remains? Millions of years ago, dinosaurs ruled the Earth - let's work to find out more about them. Learn the techniques and tools scientists use to dig for bones and fossils, and then use your skills to brush away the sand and see what you can learn from your discovery.

LITTLE SPARKS



AGES 5+
WORKSHOP

10AM-4PM (HOURLY) | 45 MINS
Get stuck into circuits and discover what electricity does, as we challenge you to create an electric-powered device! Start with a simple Electro Dough circuit, before advancing to the next level with a Snap Circuit board. Finish by using all the skills and knowledge you can muster to build a fantastic final electrical device!
Supported by



SECRET LIFE OF CORAL



AGES 5+
ACTIVITY

DROP-IN
What's life like underwater? Explore the *Secret Life of Coral* and uncover the amazing creatures that live in its communities. Help us build a coral reef by making your own sea creature in this captivating hands-on activity.

SPLAT-TASTIC



AGES 5+
WORKSHOP

10AM - 4PM (HALF HOURLY) | 20 MINS
Get your goo on in this interactive workshop where you can get creative with chemistry and design your very own slime. Test its thickness and stickiness under the extreme conditions of our 'Splat-o-Meter' and check out how the appearance and properties of materials can change when a chemical reaction takes place.

BLOOD BAR



AGES 7+
WORKSHOP

9.30AM-4.30PM (HOURLY) | DROP-IN
Pull up a chair in our *Blood Bar*, and be prepared for things to get gory! Have a go at making your own scabs, mix up a gooey blood clot and even touch a real heart. Explore the science of blood and see how we can diagnose disease with cutting-edge technology. Take a closer look at the heart, lungs and oxygen in our *Don't Hold Your Breath* activity, and find out what really happens when we get cuts and bruises in the *Scab Lab*.

MINI MECHANICS



AGES 7+
WORKSHOP

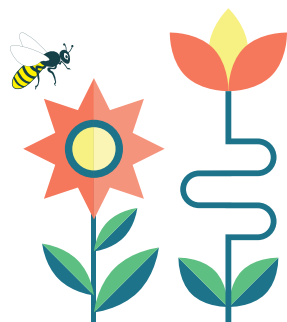
10AM-4PM (HALF HOURLY) | 20 MINS
Take a closer look at what makes an engine tick and use real tools to take one apart in this introduction to engineering. Discover what parts are needed to make a car move, while exploring our full-sized engine model. Then get hands-on as you pull apart our engines.

UNWRAPPING THE MUMMY



AGES 7+
WORKSHOP

10AM-4PM (HALF HOURLY) | 45 MINS
We need an archaeologist - can you help? An Egyptian mummy has been discovered and we need a brave individual to enter the burial chamber, unwrap its bandages and uncover the reasons why this person died.
Please note, this workshop is closed with no viewing area for parents.



BOOKING HOTLINE: 0844 557 2686

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK

NATIONAL MUSEUM OF SCOTLAND

CREATIVE LITTLEBITS™ CIRCUITS



AGES 8+
WORKSHOP

10AM-4PM (HOURLY) | 45 MINS

Join us for a fun, hands on workshop using littleBits™, a platform of easy-to-use electronic building blocks. EDF Energy is committed to inspiring a generation of children to discover their future through science, technology, engineering and maths. The possibilities are endless, let's see what you can create!

Presented by



ER SURGERY



AGES 8+
WORKSHOP

10AM-4PM (HOURLY) | 45 MINS

Paging all surgeons to the emergency room - we need all hands on deck! Join our 'doctors' in the ER and help diagnose your 'patient', before performing life-saving surgery on the knee, abdomen and brain. Get hands on using endoscopes supplied by Karl Storz - but be quick, every second counts!

Please note, this workshop is closed with no viewing area for parents.



ROBO CONSTRUCTORS



AGES 8+
WORKSHOP

10AM-4PM (HOURLY) | 45 MINS

Welcome to the world of Cubelets! Building your own robot has never been easier - just snap the robot blocks together and let the magnetic faces do the rest. Become a mini-robot engineer in this fun, fast-paced workshop, and create your own wacky and useful robots!

Supported by



VIRTUAL WORLDS



AGES 10+
ACTIVITY

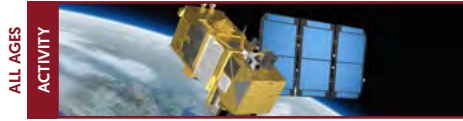
DROP-IN

Warning - this is one for intrepid explorers only. Transport yourself into another world, by grabbing one of our fantastic virtual reality headsets! Ever wondered what it's like to walk on the moon, or roam through a tropical jungle? Get a taste for adventure just by popping on a headset.

Supported by



ALL ABOUT EARTH: FROM SPACE!



ALL AGES
ACTIVITY

10AM-4:30PM | DROP-IN | ON UNTIL WED 4 APRIL | FREE
LEARNING CENTRE LEVEL 2

Join geoscientists from The University of Edinburgh to explore our planet and how it's changing, all from space! You'll learn about the kind of satellites scientists use to make observations from space, and build your own model satellite. You'll also get the chance to try out some sensors to see if they can help you detect deforestation.

Presented by The University of Edinburgh

DOING BIG SCIENCE ON SUPERCOMPUTERS



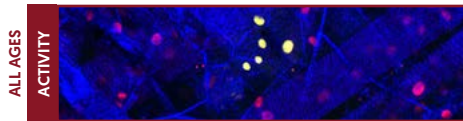
ALL AGES
ACTIVITY

10AM-4:30PM | DROP-IN | ON UNTIL WED 4 APRIL | FREE
LEARNING CENTRE LEVEL 2

Have you ever wondered what a supercomputer is? And what you could do with one? Come and try using a model supercomputer! Ask our experts about the big science that supercomputers make possible, and the problems they can help solve faster. And try out our algorithmic games - how well can you plan ahead?

Presented by The University of Edinburgh

REVOLUTIONISING CANCER TREATMENTS



ALL AGES
ACTIVITY

10AM-4:30PM | DROP-IN | ON UNTIL WED 4 APRIL | FREE
LEARNING CENTRE LEVEL 2

Join scientists from The University of Edinburgh and find out how they are working to make cancer treatments safer and more effective. Take part in activities that show how nanoparticles of one of the most famous chemical elements - gold - could help deliver medicines to patients.

Presented by The University of Edinburgh

POP-UP SCIENCE IN HAWTHORNDEN COURT

10AM-5PM | DROP-IN | ON UNTIL SUN 15 APRIL | FREE
HAWTHORNDEN COURT

We're taking over the National Museum of Scotland's Hawthornden Court with a series of drop-in science activities. This exciting programme of free activities changes across the Festival - check out the first few activities below and look out for more later in the brochure.

POP-UP SCIENCE: CAN YOU KEEP YOUR CROPS WATERED?

ALL AGES
ACTIVITY



10AM-5PM | DROP-IN | ON UNTIL WED 4 APRIL | FREE
HAWTHORNDEN COURT

Discover what it's like to live along a river, as you cooperate (or compete!) with other players to irrigate your farms. Can you find a way to share the water fairly, or will the downstream farmers be left high and dry? This game has been used all over the world for bringing people together to solve water conflicts. Now it's here in Edinburgh, will you take up the challenge?

Created by Bruce Lankford

POP-UP SCIENCE: 3D PRINTED ROBOTS

ALL AGES
ACTIVITY



10AM-5PM | DROP-IN | ON UNTIL WED 4 APRIL | FREE
HAWTHORNDEN COURT

Have fun with open source Arduino 3D printer-made robots! All you need is a smartphone to control them and they can do whatever you want: draw on a whiteboard, design an Easter egg, play (and beat) you at air hockey or fly an airship around the room. Easy to assemble and modify. Come and play!

Presented by jirobots

BOOKING HOTLINE: 0844 557 2686

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK

NATIONAL MUSEUM OF SCOTLAND

EXISTENCE: LIFE AND BEYOND

ALL AGES
EXHIBITION



10AM–5PM | DROP-IN | ON UNTIL SUN 15 APRIL | FREE | GRAND GALLERY

How did there come to be life on Earth, how has it changed, and what might it be like to live on our planet in the future? What might life be like beyond the Earth, for us and anything – or anyone – that's out there? This interactive exhibition will take you on an amazing journey to the outer reaches of life as we know it, from the origins of life on Earth to what's next for future generations. Including *Event Horizon*, a new colossal work descending from above the museum's Grand Gallery by artist Jason Hackenwerth, alongside two immersive exhibition zones and two specially-commissioned digital installations by local artists. *Existence: Life and Beyond* has been programmed with assistance from the Science Festival's Youth Consultation Group who will also be organising a pop-up event around the exhibition.

Image: *Pisces* (2013), Jason Hackenwerth

Developed with support from Creative Scotland through the Scottish Government's Edinburgh Festivals Expo Fund



Scottish Government
Riaghaltas na h-Alba
gov.scot



SUPPORTED BY
year of young people
bliadhna na h-òigridh
2018

MAKE IT GLOW!

AGES 8+
WORKSHOP



1PM | 1 HOUR | ON UNTIL MON 2 APRIL | £5
LEARNING CENTRE LEVEL 4, STUDIO 1

Find out what it's like to be a chemist and create your own glowing plastic sheet from a solution and explore the dazzling effects of light on it. You even get to take your sheet home with you! For ages 8–12. *Each ticket admits one adult if desired.*

Presented by The University of Edinburgh

GAME ON!

AGES 8+
WORKSHOP



1PM AND 3PM | 1 HOUR | ON UNTIL WED 4 APRIL | £5
LEARNING CENTRE LEVEL 4, SEMINAR ROOM

A hands-on, playful introduction to computer programming. Explore the exciting world of video games, learn the basics of coding in a visual programming language called Scratch, and design and build your very own computer game! For ages 8+ but perfect for ages 10–14. *Each ticket admits one adult if desired.*

Presented by The University of Edinburgh

SUMMERHALL

LOOK UP

AGES 6+
SHOW



2PM | 1 HOUR | £6/£5 EACH FOR 3+ TICKETS

DISSECTION ROOM

Join **Simon Watt** as he explores the science behind space exploration. Which planet is hottest? Which would float in a swimming pool? Which is the most studied? And just how much space is in space? In this amazing live show you'll discover some incredible experiments you can recreate at home and learn more about what you can see if you only look up!

RZSS EDINBURGH ZOO

ZOO TRAIL: HATCH FEST

AGES 3+
ACTIVITY



10AM–5PM | DROP-IN | ON UNTIL SUN 15 APRIL | FREE WITH ADMISSION (NO BOOKING REQUIRED)

Inspired by the UK's top toy craze, 'Hatchimals', this special themed Easter trail gives families the chance to learn more about the real animals that lay and hatch eggs in RZSS Edinburgh Zoo. *Hatch Fest* will introduce you to the eggs of a huge range of animals including penguins, flamingos, rheas, insects, owls, snakes and pelicans.

Presented by RZSS Edinburgh Zoo

CAMERA TRAP STALL

AGES 3+
ACTIVITY



11AM–3PM | DROP-IN | ALSO ON SAT 7, SUN 8 AND SUN 15 APRIL | FREE WITH ADMISSION (NO BOOKING REQUIRED)

EDUCATION CENTRE

Discover how camera traps are used to collect data which help us understand more about wild animals and their behaviour. Have a look at some of the photos these traps provide and learn how to analyse them so we can better document the existence of wildlife and the challenges they face.

Presented by RZSS Edinburgh Zoo

ZOO POPULATIONS STALL

AGES 3+
ACTIVITY



11AM–3PM | DROP-IN | ALSO ON SAT 7, SUN 8 AND SUN 15 APRIL | FREE WITH ADMISSION (NO BOOKING REQUIRED)

EDUCATION CENTRE

How do zoos keep records of all their animals and decide which ones are going to be moved? Come along to the *Zoo Populations Stall* and learn about the Zoological Information Management System (ZIMS), a web-based tool that allows zoos all around the world to share information.

Presented by RZSS Edinburgh Zoo

ZOO ORIENTEERING

AGES 8+
ACTIVITY



11AM–3PM | DROP-IN | ALSO ON SUN 1, SAT 7, SUN 8, SAT 14 AND SUN 15 APRIL | FREE WITH ADMISSION (NO BOOKING REQUIRED) | BUDONGO TRAIL

Have a go at *Zoo Orienteering* and learn how birds navigate their way around the world! You'll be given a set of instructions – all you need is access to a smart phone.

Presented by RZSS Edinburgh Zoo

DYNAMIC EARTH

OPERATION EARTH

AGES 5+



10AM-4PM | DROP-IN | ALSO ON FRI 6, WED 11, THU 12 AND FRI 13 APRIL | FREE WITH ADMISSION (NO BOOKING REQUIRED) | STRATOSPHERE

Environmental science isn't just about the planet, it's about our world. *Operation Earth* is a new national science engagement programme celebrating the work of world – leading environmental scientists featuring amazing family learning experiences that will engage, inspire and give you an insight into how scientists are working to solve some of the biggest environmental challenges on Earth.

Presented by Dynamic Earth

AROUND EDINBURGH

POWER TRIP

AGES 10+



10AM-4PM MON-FRI | 10AM-4PM SAT (NOT SUNDAYS) FREE [BOOKING REQUIRED] | TORNESS POWER STATION HUNTERSTON B POWER STATION

Discover low carbon electricity at EDF Energy's Torness and Hunterston B power station visitor centres. These interactive exhibitions explain how electricity is generated in a nuclear power station, covering nuclear safety, radiation, nuclear waste and other forms of electricity generation. To book a free power station tour at Torness contact tornessvisitorcentre@edf-energy.com or 01368 873909 and at Hunterston B contact hunterstonbtours@edf-energy.com or 01294 826008.

Presented by



NATIONAL MUSEUM OF SCOTLAND

RECURRING EVENTS

- 10AM-4.30PM | ALL ABOVE EARTH: FROM SPACE! | P.11
- 10AM-4.30PM | DOING BIG SCIENCE ON SUPERCOMPUTERS | P.11
- 10AM-4.30PM | REVOLUTIONISING CANCER TREATMENTS | P.11
- 10AM-5PM | POP-UP SCIENCE | P.11
- 10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.12
- 1PM | MAKE IT GLOW | P.12
- 1PM+3PM | GAME ON! | P.12

RZSS EDINBURGH ZOO

REOCCURRING EVENTS

- 10AM-5PM | ZOO TRAIL: HATCH FEST | P.12
- 11AM-3PM | ZOO ORIENTEERING | P.12

PRIMATES STALL

AGES 3+



11AM-3PM | DROP-IN | ALSO ON WED 4, THU 5 AND SAT 14 APRIL FREE WITH ADMISSION (NO BOOKING REQUIRED) | BUDONGO TRAIL

Find out how zoos manage what the animals in their collections eat. Take part in activities organised by the RZSS keepers that look after the diet of Edinburgh Zoo's primates.

Presented by RZSS Edinburgh Zoo

DYNAMIC EARTH

COSMOS PLANETARIUM

AGES 5+



10AM-4PM | DROP-IN | ALSO ON MON 2 APRIL | FREE WITH ADMISSION (NO BOOKING REQUIRED) | STRATOSPHERE

Join the team from *Cosmos Planetarium* on an amazing voyage of discovery searching for extraterrestrial life. We'll blast off to Mars and learn about the robotic explorers sent to its surface, then travel to distant planets and moons. Dive into vast alien oceans and travel to the outer reaches of the cosmos in search of life elsewhere in the Universe.

Presented by Dynamic Earth

AROUND EDINBURGH

REOCCURRING EVENTS

- 10AM-5PM | ECOVILLE | P.13

AROUND EDINBURGH

ECOVILLE

ALL AGES EXHIBITION



10AM-5PM | DROP IN | ON UNTIL SUN 15 APRIL | FREE | THE MOUND PRECINCT

Join us on the Mound to take a stroll through our family-friendly low carbon village, an interactive installation that will inspire visitors of all ages to take steps towards an eco-friendly future. The advent of the low carbon age requires us to rethink the ways we travel, eat, drink and power our homes, placing greater emphasis on recycling, reducing waste and conserving water and all our natural resources. This eye-catching exhibition will explore creative approaches to everyday issues and showcase technological solutions that will help us enter a new, low carbon age and embrace a sustainable way of living.

Headline sponsor



Supported by



BOOKING HOTLINE: 0844 557 2686

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK

CITY ART CENTRE



RECURRING EVENTS

9.30AM-4.30PM | CITY ART CENTRE | P.9-10

During the Science Festival we transform City Art Centre's gallery spaces into a sensational science playground, packed full of workshops, shows and interactive events. Day Pass required.

RZSS EDINBURGH ZOO

VET STALL



AGES 3+ ACTIVITY

11AM-3PM | DROP-IN | ALSO ON TUE 3 APRIL
FREE WITH ADMISSION (NO BOOKING REQUIRED)
BUDONGO TRAIL

Ever wondered what it's like to be a vet at Edinburgh Zoo? Now you can find out! Come to our vet stall to learn about the work they do at RZSS

Presented by RZSS Edinburgh Zoo

CITY ART CENTRE



RECURRING EVENT

9.30AM-4.30PM | CITY ART CENTRE | P.9-10

During the Science Festival we transform City Art Centre's gallery spaces into a sensational science playground, packed full of workshops, shows and interactive events. Day Pass required.

NATIONAL MUSEUM OF SCOTLAND

RECURRING EVENTS

10AM-4.30PM | ALL ABOUT EARTH: FROM SPACE! | P.11

10AM-4.30PM | DOING BIG SCIENCE ON SUPERCOMPUTERS | P.11

10AM-4.30PM | REVOLUTIONISING CANCER TREATMENTS | P.11

10AM-5PM | POP-UP SCIENCE | P.11

10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.12

1PM | MAKE IT GLOW | P.12

1PM+3PM | GAME ON! | P.12

RZSS WILDGENES LAB STALL



AGES 5+ ACTIVITY

11AM-3PM | DROP-IN | ALSO ON TUE 3 APRIL | FREE WITH ADMISSION (NO BOOKING REQUIRED) | BUDONGO TRAIL

Discover the world of genetics and DNA, learn about what happens in our WildGenes lab and make your own origami DNA!

Presented by RZSS Edinburgh Zoo

NATIONAL MUSEUM OF SCOTLAND

RECURRING EVENTS

10AM-4.30PM | ALL ABOUT EARTH: FROM SPACE! | P.11

10AM-4.30PM | DOING BIG SCIENCE ON SUPERCOMPUTERS | P.11

10AM-4.30PM | REVOLUTIONISING CANCER TREATMENTS | P.11

10AM-5PM | POP-UP SCIENCE | P.11

10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.12

1PM+3PM | GAME ON! | P.12

SPARK CART SCIENCE



ALL AGES ACTIVITY

10.30AM AND 2PM | DROP-IN | ON UNTIL THU 12 APRIL (EXCLUDING WEEKENDS AND 2PM FRI 6 APRIL) | FREE LEVEL 3 ABOVE HAWTHORNDEN COURT

Meet our Museum experts to find out about our science, technology and natural sciences collections! Get up close to objects and specimens and discover how science is used in the Museum to look after collections, and to learn more about them.

Presented by National Museum of Scotland
Image: Ruth Armstrong Photography

RZSS EDINBURGH ZOO

RECURRING EVENTS

10AM-5PM | ZOOTRAIL: HATCHFEST | P.12

BEYOND THE PANDA



AGES 8+ WORKSHOP

11AM, 12, 1.30 AND 2.30PM | 1 HOUR | ON UNTIL WED 4 APRIL | FREE WITH ADMISSION (BOOKING ESSENTIAL)
MANSION HOUSE

The world is fascinated by giant pandas! Learn more about them - including their reproductive and life cycles - and what's involved in panda breeding in these workshops at the only home of giant pandas in the UK. Booking essential See edinburghzoo.org.uk for details.

Presented by RZSS Edinburgh Zoo

DYNAMIC EARTH

RECURRING EVENTS

10AM-4PM | COSMOS PLANETARIUM | P.13

NATURE DETECTIVES: FAMILY FUN IN THE OUTDOORS



AGES 6+ ACTIVITY

10.30AM AND 1.30PM | 2 HOURS | ALSO ON TUE 3 APRIL
FREE WITH ADMISSION (BOOKING REQUIRED)

For thousands of years, Holyrood Park has been home to a rich variety of wildlife. Take a walk on the wild side to discover creatures past and present who have made their home here, explore unique habitats and learn all about this special ecosystem with the Dynamic Earth Learning Team. There will be lots of challenges and investigation opportunities for families to take part in together. Meet at Dynamic Earth. Wear sturdy shoes and bring waterproofs for this outdoor event.

Presented by Dynamic Earth

ORSOM THE OCTOPUS



AGES 3+ WORKSHOP

10.30AM AND 12PM | 45 MINS | ALSO ON WED 4 APRIL
£6 | LEARNING CENTRE LEVEL 4, STUDIO 1

Fun, educational and interactive session about the amazing lives of octopuses using props, imaginative play, games and music. Younger siblings welcome to watch for free. *Children must be accompanied by an adult. Accompanying adults do not require a ticket.*

Presented by Wild Planet Explorers

AROUND EDINBURGH

RECURRING EVENTS

9AM-4PM | POWER TRIP | P.13

10AM-5PM | ECOVILLE | P.13

NATIONAL MUSEUM OF SCOTLAND

DR BUNHEAD'S RUBBISH PUPPETS' TRIP TO MARS



ALL AGES SHOW

11AM, 12PM, 1.30PM, 2.30PM AND 3.30 PM | 25 MINS
 ALSO ON WED 4 APRIL | FREE | EARLY PEOPLE GALLERY
 Dr Bunhead's puppets made from recycled rubbish are back! With nothing more than their imagination and some science they set off to be the first puppets to land on Mars.
 Presented by The University of Edinburgh

FUTURE BEASTS AND HOW TO KNOW THEM



AGES 6+ SHOW

11AM AND 2PM | 1 HOUR | £6/£5 EACH FOR 3+ TICKETS
 AUDITORIUM
 What might the future creatures of Earth look like? And what creatures might humankind accidentally create through its current actions? Zoologist, author and presenter **Jules Howard** takes audiences on a whirlwind tour of the creatures that might one day walk the Earth by applying Darwin's theory of evolution by natural selection. Spin the infamous Wheel of Death and see how today's animals might evolve! Be the one-in-a-million creature that survives to colonise the world!

SURVIVE IN SPACE



ALL AGES SHOW

11AM AND 2PM | 1 HOUR | £6/£5 EACH FOR 3+ TICKETS
 DISSECTION ROOM
 Faced with a life-threatening malfunction, a lone astronaut on board a space station has to improvise a series of solutions using only what is immediately available, and in this case, with the help of an audience.
 You're going to have to think fast and use your knowledge to avert disaster as the clock ticks down. Using immersive theatre techniques and spectacular demonstrations, this is a show where the ending is in your hands.
 Presented by Science Theatre

MINIBEASTS WITH JESS FRENCH



AGES 8+ ACTIVITY

3PM | 1 HOUR | £6/£5 EACH FOR 3+ TICKETS | MAIN HALL
 Fancy meeting a foot-long centipede or a spider the size of your dinner plate? Join CBeebies presenter **Jess French** to do just that! With her unparalleled zeal for insects, Jess dives headfirst into the breathtaking world of invertebrates, exploring everything from bird-eating tarantulas and glow-in-the-dark scorpions to metre-long stick insects and bat-eating centipedes. Learn about the perfect co-evolution of nectar-drinking insects and the flowers they pollinate and discover how minibeasts mate, fight, hide, collaborate, evolve and survive in the most extreme conditions.
 Presented by Bloomsbury Publishing

DOUBLE DOME NIGHTS



AGES 5+ FILM

6PM | 1 HOUR | ALSO ON WED 4, THU 5, THU 12 AND FRI 13 APRIL | £8/£5 (FREE FOR EXPLORER PASS HOLDERS)
 SHOWDOME
 Enjoy an amazing cinematic treat. Featuring stunning high-definition 360° digital full dome technology and explosive surround sound; the ShowDome invites you into an immersive experience like no other. Each night we'll be screening a double bill of 30-minute films suitable for everyone aged 5+. Pick up your popcorn on arrival and enjoy refreshments to buy from the bar throughout the evening.
 Presented by Dynamic Earth

RZSS EDINBURGH ZOO

RECURRING EVENTS

- 10AM-5PM** | ZOO TRAIL: HATCH FEST | P.12
- 11AM, 12, 1.30, 2.30PM** | BEYOND THE PANDA | P.14
- 11AM-3PM** | VET STALL | P.14
- 11AM-3PM** | RZSS WILDGENES LAB STALL | P.14

DYNAMIC EARTH

RECURRING EVENTS

- 10.30AM + 1.30PM** | NATURE DETECTIVES | P.14

POET EXPLORERS



AGES 5+ ACTIVITY

10AM-4PM | DROP-IN | FREE WITH ADMISSION (NO BOOKING REQUIRED) | STRATOSPHERE
 The Scottish Poetry Library invites you to embark on a science poetry adventure at Dynamic Earth! Scientists and poets both look very closely at the world. Find out how as you travel through time and assemble words hidden in the galleries to complete *The Lost Poem of Dynamic Earth* and take part in a series of exciting challenges to become a Poet Explorer.
 Presented by Dynamic Earth

AROUND EDINBURGH

RECURRING EVENTS

- 9AM-4PM** | POWER TRIP | P.13
- 10AM-5PM** | ECOVILLE | P.13

PILOT TRAINING SCHOOL



AGES 6+ ACTIVITY

12PM-4PM | DROP IN | ON UNTIL FRIDAY 13 APRIL
 (EXCLUDING WEEKENDS) | FREE WITH ADMISSION
 NATIONAL MUSEUM OF FLIGHT

Have you got the right stuff? Come and test yourself on our assault course and in *Fantastic Flight*, our interactive flight science exhibition, to see if you would be a better pilot than your friends and family. Then come to the Education Centre to find out how pilots are selected and make your own reaction timer and colour blindness tests.
 Presented by National Museum of Flight

BOOKING HOTLINE: 0844 557 2686

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK

SCIENCE IN THE SPOT LIGHT

We're big believers in science being brought outside the laboratory, and love to see it encouraged and embraced in all environments, including theatre.

Our *Science in the Spotlight* family programme focuses on bringing science themes to the boards. We are delighted to announce our new 2018 commission, *Valentina's Galaxy* (p.17) by Scottish theatre company Frozen Charlotte (creators of the award-winning *Too Many Penguins?*). *Valentina's Galaxy* is an inspirational experience for starry-eyed 2-5 year olds and their adults. Join us for this intergalactic journey, defying gender stereotypes, celebrating women and exploring the wonders of space and time.

We also welcome *Space Ape* by *Andy Cannon* (p.21), from Red Bridge Arts, telling the story of Yorick, a very special ape destined for interstellar travel. Aimed at ages 7+, Yorick's tale takes young audiences on a journey through science, philosophy and outer space, using every day objects and animation as he missions to Mars.

Families will also enjoy a wealth of family shows in the *Science in the Spotlight* programme at Summerhall, including *The Ornithopter* (p.28), an exciting new promenade show blending puppetry, object manipulation and physical theatre to introduce an inventor who dreams of touching the sun.

Visit sciencefestival.co.uk/science-in-the-spotlight

WEDNESDAY 4 APRIL

CITY ART CENTRE



RECURRING EVENTS

9.30AM-4.30PM | CITY ART CENTRE | SEE P.9-10

During the Science Festival we transform City Art Centre's gallery spaces into a sensational science playground, packed full of workshops, shows and interactive events. Day Pass required.

NATIONAL MUSEUM OF SCOTLAND

RECURRING EVENTS

10AM-4.30PM | ALL ABOUT EARTH: FROM SPACE! | P.11

10AM-4.30PM | DOING BIG SCIENCE ON SUPER COMPUTERS | P.11

10AM-4.30PM | REVOLUTIONISING CANCER TREATMENTS | P.11

10AM-5PM | POP-UP SCIENCE | P.11

10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.12

10.30AM + 12PM | ORSOM THE OCTOPUS | P.14

10.30AM + 2PM | SPARK CART SCIENCE | P.14

11AM, 12, 1.30, 2.30 + 3.30PM | DR BUNHEAD'S RUBBISH PUPPETS' TRIP TO MARS | P.15

1PM + 3PM | GAME ON! | P.12

PHYSICS WIZARDRY: POTION AND ALCHEMY CLASS



AGES 7+
WORKSHOP

11AM, 1PM AND 3PM | 1 HOUR | ON UNTIL FRI 6 APRIL | £5
LEARNING CENTRE LEVEL 4, STUDIO 2

Be prepared for an unusual class! Through the power of physics, learn how to make spectacular potions with unexpected effects. Physics Wizards will explain the science wizardry involved so that you too can become a Physics Wizard and impress your non-wizarding friends and family. For ages 7-11. *Each ticket admits one adult if desired.*

Presented by The University of Edinburgh

THE CHEMISTRY SHOW



AGES 6+
SHOW

1PM | 1 HOUR | ALSO ON THU 5 APRIL
£5/£4 EACH FOR 3+ TICKETS | AUDITORIUM

Be prepared for bangs, colours, flames, foam and even a song! What happens when things get really cold? How can we make cars that don't harm the environment? And why should a lettuce be very, very afraid of **Paul Murray** and **Robin Andrews**? The vibrant show is back, jam-packed with experiments! You might even learn something...

Presented by The University of Edinburgh

SUMMERHALL

VALENTINA'S GALAXY

AGES 2+
SHOW



10.30AM (PREVIEW WED 4 APRIL), 10.30AM AND 1.30PM (ALL OTHER DATES) | ON UNTIL SUN 8 APRIL | 45 MINS | £5 (PREVIEW) £6/£5 EACH FOR 3+ TICKETS | OLD LAB

Valentina's Galaxy - an intergalactic inspiration for starry-eyed 2-5 year olds and their adults. Join award-winning theatre company *Frozen Charlotte*, makers of *Paperbelle* and *Too Many Penguins?*, for a fascinating, funny and moving experience inspired by the wondrous adventures of real women in space.

Created especially for young audiences, this immersive performance will captivate children and adults alike with a combustible concoction of experiments, rocket launches and stargazing. Commissioned by Edinburgh International Science Festival working in partnership with Imagineate and Starcatchers, produced by Frozen Charlotte Productions



Scottish Government
Riaghaltas na h-Alba
gov.scot

Developed with support from Creative Scotland through the Scottish Government's Edinburgh Festivals Expo Fund

LIGHT DRAWING

ALL AGES
WORKSHOP



11AM AND 2PM | 1 HOUR | £10 | DISSECTION ROOM
Scientifically creative and creatively scientific, *Light Drawing* is an illuminating workshop on the science of light and photography. With a bit of help from science you can sketch and doodle with a light bulb. Using long exposure photography and a little imagination we will be making brilliant, bright and bold images. *Accompanying adults wishing to take part also require a ticket.*

ZOOMASAURUS: THE DAWN OF ANIMATION

AGES 6+
SHOW



11AM | 50MINS | £6.50/£22 (4 TICKETS)
ANATOMY LECTURE THEATRE
Zoomasaurus: The Dawn of Animation is a fun and interactive storytelling piece which explores a tongue-in-cheek history of animation using projections and performance devised and developed alongside young people who attend The Zoom Club Digital Arts workshops. Presented by The Zoom Club

RZSS EDINBURGH ZOO

RECURRING EVENTS

10AM-5PM | ZOOTRAIL: HATCH FEST | P.12
11AM, 12, 1.30 + 2.30PM | BEYOND THE PANDA | P.14
11AM-3PM | PRIMATES STALL | P.15

DYNAMIC EARTH

RECURRING EVENTS

6PM | DOUBLE DOME NIGHTS | P.15

MEET THE SCIENTISTS: ARCTIC WARMTH

AGES 5+
ACTIVITY



10AM-4PM | DROP-IN | ALSO ON THU 5 APRIL
FREE WITH ADMISSION (NO BOOKING REQUIRED)
STRATOSPHERE

To stay warm in the Arctic, humans must wear layers of clothes to trap air and keep heat in. For animals that live outdoors all winter, their fur works well, but so does burrowing under the snow to trap air. Drop in to meet scientists who are just back from studying the insulating properties of snow and take part in activities using thermal imaging technology to see how much heat you would lose in the Arctic without the right clothing. Presented by Dynamic Earth

AROUND EDINBURGH

RECURRING EVENTS

9AM-4PM | POWER TRIP | P.13
10AM-5PM | ECQVILLE | P.13
12PM-4PM | PILOT TRAINING SCHOOL | P.15

HEART DISSECTION FOR KIDS!

AGES 10+
WORKSHOP



2PM | 1 HOUR | ALSO ON THU 5, WED 11 AND THU 12 APRIL
£6 | SURGEONS' HALL MUSEUMS | STRICT AGE LIMIT OF 10+

Find out how your heart works to keep your body connected. You'll discover lots about this incredible organ as you dissect your own pig's heart, learning about the journey that blood takes around the heart, tugging on some real heart strings and finding out what causes heart attacks. Children must be aged 10 or above and be accompanied by an adult. *No ticket required for accompanying adult.*

Presented by Surgeons' Hall Museums

BOOKING HOTLINE: 0844 557 2686

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK

CITY ART CENTRE



RECURRING EVENTS

9.30AM-4.30PM | CITY ART CENTRE | P.9-10

During the Science Festival we transform City Art Centre's gallery spaces into a sensational science playground, packed full of workshops, shows and interactive events. Day Pass required.

NATIONAL MUSEUM OF SCOTLAND

RECURRING EVENTS

10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.12
 10.30AM + 2PM | SPARK CART SCIENCE | P.14
 11AM, 1PM + 3PM | PHYSICS WIZARDRY | P.16
 1PM | THE CHEMISTRY SHOW | P.16

AMAZING BODIES: FROM SCIENCE TO FUTURE MEDICINE

ALL AGES
ACTIVITY



10AM-4.30PM | DROP-IN | ALSO ON FRI 6 APRIL
 FREE | LEARNING CENTRE LEVEL 2

Join medical and veterinary scientists from The University of Edinburgh and get hands-on with human and animal body-themed activities. Find out how science will advance future medicine through genomics, stem cells and new technologies. Experience how lungs inflate and how deep your breath is. Discover what is inside your body, heart, brain and under your skin, and your disease risk factors.

Presented by The University of Edinburgh

POP-UP SCIENCE: STEMS. BEND YOUR BRAIN

ALL AGES
ACTIVITY



10AM-4.30PM | DROP-IN | FREE | HAWTHORNDEN COURT

Come and play with the new 3D maker toy that's made from an incredibly flexible polymer for mind-bending fun. Take the seed of an idea, add curiosity and watch it grow as we discover what we can make with 5,000 stems... that's enough to make a 125m long double helix! Enjoy the most exciting and puzzling conversation your hands will ever have with your brain.

NATIONAL MUSEUM OF SCOTLAND

MARTY: ACTIVATE!

AGES 11+
WORKSHOP



12PM AND 2PM | 1 HOUR | ALSO ON FRI 6 APRIL | £5
 LEARNING CENTRE LEVEL 4, SEMINAR ROOM

Get your hands on walking, dancing robot Marty and learn how robots work. By coding in Scratch, teach a robot how to interact with the world around it. For ages 11-15, ideally with some experience of using Scratch or coding? Do *Game On!* workshop (p.12), then this one. *Each ticket also admits one adult if desired.*

Presented by The University of Edinburgh

SUMMERHALL

RECURRING EVENTS

10.30AM + 1.30PM | VALENTINA'S GALAXY | P.17

EATEN

AGES 6+
SHOW



11AM AND 2PM | 50 MINS | £6/£5 EACH FOR 3+ TICKETS
 DISSECTION ROOM

What if your food started talking back? Meet Lionel the lion. He's just eaten a human called Mamoru for lunch, but hasn't chewed his food. So Mamoru's alive and well in his stomach, and now wants to say hello. A strange friendship between the eater and the eaten starts to grow, meanwhile, Lionel's breakfast wants to say hello... from his bottom! *Eaten* is a show about food, eating and being eaten that invites children and grown-ups to explore the fascinating world of food chains.

Presented by Mamoru Iriguchi
 Image: Manuel Vason

RZSS EDINBURGH ZOO

RECURRING EVENTS

10AM-5PM | ZOO TRAIL: HATCH FEST | P.12
 11AM-3PM | PRIMATES STALL | P.13

EGG SENSE

AGES 3+
ACTIVITY



11AM-3PM | DROP-IN | ALSO ON FRI 6 APRIL | FREE
 WITH ADMISSION (NO BOOKING REQUIRED) |
 BUDONGO TRAIL

Meet the team of Heriot-Watt engineering students who have designed a 'biosensor' egg, an incredible invention to help us understand what happens when birds sit on their eggs. With activities like the *Who laid it?* game to familiarise you with some of the birds at RZSS Edinburgh Zoo, this engineering-meets-nature event is going to be a lot of fun!

Presented by RZSS Edinburgh Zoo

DYNAMIC EARTH

RECURRING EVENTS

6PM | DOUBLE DOME NIGHTS | P.15
 10AM-4PM | ARTIC WARMTH | P.17

AROUND EDINBURGH

RECURRING EVENTS

9AM-4PM | POWER TRIP | P.13
 10AM-5PM | ECQVILLE | P.13
 2PM | HEART DISSECTION FOR KIDS! | P.17
 12PM-4PM | PILOT TRAINING SCHOOL | P.15

MAKE TIME FAMILY WORKSHOPS

AGES 7+
WORKSHOP



10AM AND 2PM | 2 HOURS | ALSO ON FRI 6, THU 12 AND
 FRI 13 APRIL | £3 | NELSON MONUMENT

With the help of a professional artist, this is your chance to make your own artwork inspired by ideas of time and timepieces. You'll learn about the science of telescopes and clocks, as well as the history of timekeeping on Calton Hill, and then get busy creating your own work. *Accompanying adults do not require a ticket.*

Presented by Collective

FRIDAY 6 APRIL

CITY ART CENTRE



RECURRING EVENTS

9.30AM-4.30PM | CITY ART CENTRE | P.9-10

During the Science Festival we transform City Art Centre's gallery spaces into a sensational science playground, packed full of workshops, shows and interactive events. Day Pass required.

NATIONAL MUSEUM OF SCOTLAND

RECURRING EVENTS

10AM-4.30PM | AMAZING BODIES: FROM SCIENCE TO FUTURE MEDICINE | P.18

10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.12

10.30AM | SPARK CART SCIENCE | P.14

11AM, 1PM + 3PM | PHYSICS WIZARDRY | P.16

12PM + 2PM | MARTY: ACTIVATE! | P.18

POP-UP SCIENCE: UV DRAWING ROOM

ALL AGES
ACTIVITY



10AM-5PM | DROP-IN | ON UNTIL TUE 10 APRIL | FREE
HAWTHORNDEN COURT

Enter the *UV Drawing Room* and create amazing drawings together. Hear amazing facts about UV light and the history surrounding its discovery while you doodle across the walls and tables in the dark tent using UV torches and special templates. A unique, fun and illuminating experience for all ages.

POP-UP SCIENCE: CYMASENSE

ALL AGES
ACTIVITY



10AM-5PM | DROP-IN | ON UNTIL TUE 10 APRIL | FREE
HAWTHORNDEN COURT

Cymatic images are two-dimensional, symmetrical pictures created by the movement of sound through water. *CymaSense* is an interactive tool that allows you to create beautiful and colourful audio-visual impressions in three dimensions using a microphone or keyboard and this bespoke interactive table. Come and try it for yourself!

Presented by Edinburgh Napier University

NATIONAL MUSEUM OF SCOTLAND

NATURE MATTERS

AGES 8+
WORKSHOP



11AM AND 1PM | 1 HOUR | ON UNTIL SUN 8 APRIL

£5 | LEARNING CENTRE LEVEL 4, STUDIO 1

Do you want to invent the materials of the future? Then be inspired by nature! Join our soft matter physicists and learn how to make light using a potato, create a magnetic liquid sculpture, examine food under a microscope and try to break the record for the longest fibre made from seaweed. For ages 8-12. *Each ticket admits one adult if desired.*

Presented by The University of Edinburgh

SUMMERHALL

RECURRING EVENTS

10.30AM + 1.30PM | VALENTINA'S GALAXY | P.17

RZSS EDINBURGH ZOO

RECURRING EVENTS

10AM-5PM | ZOO TRAIL: HATCHFEST | P.12

11AM-3PM | EGG SENSE | P.18

DYNAMIC EARTH

RECURRING EVENTS

10AM-4PM | OPERATION EARTH | P.13

AROUND EDINBURGH

RECURRING EVENTS

9AM-4PM | POWER TRIP | P.13

10AM-5PM | ECQVILLE | P.13

10AM + 2PM | MAKE TIME FAMILY WORKSHOPS | P.18

12PM-4PM | PILOT TRAINING SCHOOL | P.15

RATATOUILLE SNACK-ALONG SCREENING

ALL AGES
FILM



1.30PM | 2 HOURS | £3 | NORTH EDINBURGH ARTS |

A feast for eyes and tummies, come along for this showing of Disney family favourite *Ratatouille* (Certificate U) and get a themed snack box so you can experience some of the film's tastes and smells along with the characters! Ambitious young rat Remy dreams of becoming a world famous chef, and with some luck and a bit of help from his new friend Linguini, he gets a chance to cook in one of Paris' finest restaurants. Just as Remy experiments with flavours you can also discover why cheese and grapes go so well together and other kid-friendly taste explosions.

Image: ©Disney/Pixar

SCIENCE THAT POPS!

This Easter, your family can discover science all over Edinburgh. Throughout the Science Festival there are pop-up activities for all ages happening in our partner venues and beyond...

Join us at the National Museum of Scotland, where our *Pop-up Science* drop-in events (p.18-19) will introduce you to geology and robotics, and let you play with 3D modelling toys and draw with UV light.

Or head to Summerhall, where *The Experimentarium* (p.24-25) - our free, drop-in family event - will take over the Main Hall from Monday 9-Friday 13 April, featuring hands-on activities and interactives tackling everything from human language to the science of the brain, and from air pollution to the importance of outdoor public space.

If you're on the move, look out for our *Street Science* busking bikes (p.8) as they take mind-boggling experiments and dazzling demonstrations on to the streets of Edinburgh throughout the Festival. Visit sciencefestival.co.uk/street-science for more information.



BOOKING HOTLINE: 0844 557 2686

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK

CITY ART CENTRE



RECURRING EVENTS

9.30AM-4.30PM | CITY ART CENTRE | P.9-10

During the Science Festival we transform City Art Centre's gallery spaces into a sensational science playground, packed full of workshops, shows and interactive events. Day Pass required.

NATIONAL MUSEUM OF SCOTLAND

RECURRING EVENTS

10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.12

10AM-5PM | POP-UP SCIENCE | P.19

11AM+1PM | NATURE MATTERS | P.19

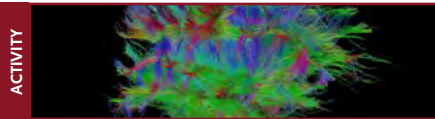
ROBOT LAB



10AM-4.30PM | DROP-IN | ON UNTIL MON 9 APRIL | FREE
LEARNING CENTRE LEVEL 2

Come and interact with our friendly robots from the Edinburgh Centre for Robotics. From an assembly line robot that wants to learn how to work with you, to cute football playing robots, learn about the many ways in which robots are trying to understand and imitate human beings. Presented by The University of Edinburgh

HOW OLD ARE YOU REALLY?



10AM-4.30PM | DROP-IN | ON UNTIL MON 9 APRIL | FREE
LEARNING CENTRE LEVEL 2

How old are you? Well, it depends on whether we ask your date of birth, or examine your body, brain or DNA. Did you know that each might give a different answer? Find out more with our hands-on activities, and take part in a real research experiment about how our age in years compares to information provided by our bodies. Presented by The University of Edinburgh

NATIONAL MUSEUM OF SCOTLAND

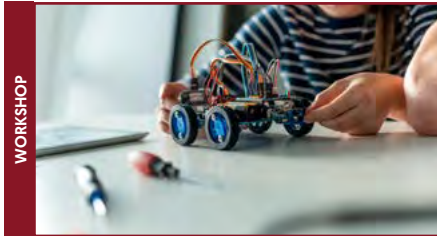
POP-UP ENGINEERING



10AM-4.30PM | DROP-IN | ON UNTIL MON 9 APRIL | FREE
LEARNING CENTRE LEVEL 2

Pop-ups are ingenious engineering mechanisms which you can make yourself. Choose your favourite design, transform it from a flat cardboard shape to a cool 3D model, and then decorate it to take home. Please do pop in! Presented by The University of Edinburgh

HYDROGEN CHALLENGE COMPETITION



10.30AM, 1PM AND 3PM | 90 MINS | ALSO ON SUN
8 APRIL | £15 (MINIMUM OF 2 TICKETS REQUIRED)
LEARNING CENTRE LEVEL 4, SEMINAR ROOM

Could hydrogen power the cars of the future? Working in small groups, you'll design and build your own model vehicle, powered by a hydrogen fuel cell, prototyping, testing and making alterations to improve its speed and distance travelled. Finally, teams will compete against each other to discover which design is the most efficient. *Adults may accompany young children, but must buy a ticket if they wish to take part.* Presented by Arcola Energy Ltd

SUMMERHALL

RECURRING EVENTS

10.30AM + 1.30PM | VALENTINA'S GALAXY | P.17

RZSS EDINBURGH ZOO

RECURRING EVENTS

10AM-5PM | ZOO TRAIL: HATCH FEST | P.12

11AM-3PM | ZOO ORIENTEERING | P.12

11AM-3PM | ZOO POPULATIONS STALL | P.12

11AM-3PM | CAMERA TRAP STALL | P.12

ROYAL BOTANIC GARDEN EDINBURGH

#PIANODROME RESONANCY



10AM-5PM | DROP-IN | ON UNTIL SAT 14 APRIL | FREE
INVERLEITH HOUSE

In Summer 2018 artist **Tim Vincent-Smith** and his team will be building an amphitheatre entirely from discarded pianos to grace the Royal Botanic Garden Edinburgh and we need your help to make it happen. A first of its kind performance space, the #Pianodrome will bring art, music, science, movement and creativity under one geodesic dome roof. Join us to create artistic interventions and build experimental instruments. Presented by Royal Botanic Garden Edinburgh

GEODOME WORKSHOP



10AM | 3 HOURS | ALSO ON FRI 13 APRIL | £15
STANDARD TICKET/£7 CHILDREN AND CONCESSIONS
INVERLEITH HOUSE

Learn the basics of Buckyballs. Using the 88 keys salvaged from a single piano keyboard we will piece together unique geodesic artworks based on Buckminster Fuller's theories about how to make efficient structures using maths. Participants will create their own geodesic models which they can take home before working together to build a unique artwork which will grace the #Pianodrome, an amphitheatre created by artist **Tim Vincent-Smith** entirely out of discarded pianos, on its completion. Presented by Royal Botanic Garden Edinburgh

INSTRUMENT MAKING WORKSHOP



2PM | 3 HOURS | ALSO ON FRI 13 APRIL | £20
STANDARD TICKET/£10 CHILDREN AND CONCESSIONS
INVERLEITH HOUSE

Explore the different sounds that can be made by tapping, bowing, plucking and blowing the various parts of a piano that has been fully dissected. Explore the resonant properties of different woods, metals and felt pieces. Develop your own instrument design with the help of our resident experts in woodworking and acoustics and then get building! Participants will be able to take their completed instrument home with them. Presented by Royal Botanic Garden Edinburgh

ALL AGES

ACTIVITY

ALL AGES

ACTIVITY

ALL AGES

ACTIVITY

ALL AGES

ACTIVITY

AGES 6+

WORKSHOP

ALL AGES

WORKSHOP

ALL AGES

ACTIVITY

ALL AGES

WORKSHOP

ROYAL BOTANIC GARDEN EDINBURGH

NATURE OF FOOD



ALL AGES
ACTIVITY

11AM-4PM | DROP-IN | ON UNTIL FRI 13 APRIL | FREE
REAL LIFE SCIENCE STUDIO, JOHN HOPE GATEWAY
Food is connected to just about every aspect of our lives. Scottish Environment, Food and Agriculture Research Institutes (SEFARI) collective presents a week of tasty science exploring what we eat and how the nation's diet affects our health and that of the natural world. Fun and engaging drop-in activities developed in association with Young Scot will be accompanied by pop-up talks presented by SEFARI scientists at 2pm and 3pm each day, check rbge.org.uk for details.

Presented by Royal Botanic Garden Edinburgh

DYNAMIC EARTH

SURVIVAL OF THE SPECIES



AGES 5+
ACTIVITY

10AM-4PM | DROP-IN | FREE WITH ADMISSION (NO BOOKING REQUIRED) | STRATOSPHERE

Our planet is changing rapidly, creating huge challenges for the survival of many of our rarest species. Across the globe, RSPB's scientists are working with partners to conduct ground-breaking research that will tackle critical conservation issues. Join us to explore the science that could help save precious species from extinction - from the albatross in the southern oceans, to pygmy hippos in the Gola forest and to take part in challenges that could help find solutions to the problems they face.

Presented by Dynamic Earth

AROUND EDINBURGH

RECURRING EVENTS

10AM-4PM | POWER TRIP | P.13
10AM-5PM | ECOVILLE | P.13

SPACE APE: BY ANDY CANNON



AGES 7+
SHOW

2PM AND 7PM | 1 HOUR | £10/£8/£32 FAMILY (4 TICKETS)
SCOTTISH STORYTELLING CENTRE | NETHERBOW THEATRE

Once upon a time, approximately 20 years from now, Yorick stands alone, suited up and ready to blast off in a rocket on his celebrated journey to Mars. *Space Ape* is a new science fiction storytelling performance that will take young audiences on a journey through art, science and philosophy, and on a mission with a very special ape. **Andy Cannon**, Scotland's leading storyteller for young audiences, tells the tale, sharing his passion for space travel using everyday objects and animation.

Produced by Red Bridge Arts in association with Edinburgh International Science Festival and Puppet Animation Festival

DR BUNHEAD'S EASTER EGG OF DOOM



AGES 7+
SHOW

3PM | 1 HOUR | ALSO ON SUN 8 APRIL | £7/£6 EACH FOR 3+ TICKETS | GEORGE SQUARE THEATRE

Discover the deadliest Easter egg in the world as TV's favourite stunt scientist, **Dr Bunhead**, blasts bunnies into space in his search for the science of Easter. Warning! May lead to serious addiction to science. Contains loud bangs and traces of nuts.

Presented in association with The University of Edinburgh

SHARE YOUR PASSION FOR SCIENCE

Edinburgh International Science Festival is Scotland's largest science education charity, inspiring adults and children alike to connect with the world around them. Like you, we believe in a Scotland that is engaged with scientific ideas, where individuals think about the role that science plays in their own lives and where our young people are inspired to move into emerging fields and take on the challenges of tomorrow.

It is only with the ongoing commitment of people like you that we can ensure that our events are accessible and affordable, helping as many people, of any age and background, discover their love and talent for science and technology.

YOU CAN HELP US CONTINUE THIS LEGACY

By making a donation when you purchase your ticket, or by filling out a donation form available at our events, you can provide the opportunity for everyone to share in the magic of the Science Festival.

Please support us today and turn your passion for science into the spark that inspires the next generation.

HOW CAN YOU HELP?

£10 will pay for four of our workshop smartphone microscope kits, giving children the opportunity to engage with science through hands-on experience.

£25 will pay for a family (who would not otherwise be able to attend) to enjoy our City Arts Centre spectacular - an experience that can ignite a lifelong interest in science.

£50 buys enough equipment for 10 primary school classes to experiment with colour chemistry in our *Fizz, Boom Bang* workshop.

For more information about our work and how you can support these initiatives, please contact David, Development Manager: david@scifest.co.uk



NATIONAL MUSEUM OF SCOTLAND

RECURRING EVENTS

- 10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.12
- 10AM-5PM | POP-UP SCIENCE | P.19
- 10AM-4.30PM | ROBOT LAB | P.20
- 10AM-4.30PM | HOW OLD ARE YOU REALLY? | P.20
- 10AM-4.30PM | POP-UP ENGINEERING | P.20
- 10.30AM, 1 + 3PM | HYDROGEN CHALLENGE COMPETITION | P.20
- 11AM + 1PM | NATURE MATTERS | P.19

SUMMERHALL

RECURRING EVENTS

- 10.30AM + 1.30PM | VALENTINA'S GALAXY | P.17

RZSS EDINBURGH ZOO

RECURRING EVENTS

- 10AM-5PM | ZOO TRAIL: HATCH FEST | P.12
- 11AM-3PM | ZOO ORIENTEERING | P.12
- 11AM-3PM | ZOO POPULATIONS STALL | P.12
- 11AM-3PM | CAMERA TRAP STALL | P.12

GARDENS WALKROUND



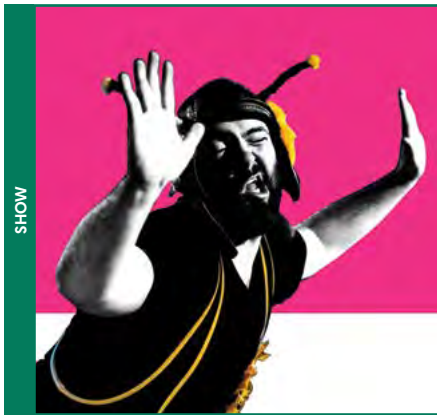
9AM | 2 HOURS | £5 (DOES NOT INCLUDE DAY ADMISSION TO THE ZOO) | EVOLUTION GARDEN
 Get exclusive entry to RZSS Edinburgh Zoo before it's open to the public and learn about the evolution of plants with Edinburgh Zoo's Head Gardener, **Rab Harden**. Enter via the members' gate from the zoo carpark.
 Presented by RZSS Edinburgh Zoo

ROYAL BOTANIC GARDEN EDINBURGH

RECURRING EVENTS

- 10AM-5PM | #PIANODROME RESONANCY | P.20
- 11AM-4PM | NATURE OF FOOD | P.21

ME AND MY BEE



4PM | 1 HOUR
 ALSO ON MON 9-WED 11 APRIL | 11AM AND 2PM | £6 STANDARD TICKET/£4 CHILDREN AND CONCESSIONS
 LECTURE THEATRE
 Our fuzzy little friends need our help to survive. ThisEgg's new family comedy, featuring live music, is a political party, disguised as a party party, disguised as a show, that invites you to save the world, one bee at a time. Plant the seed for change and join the bee party!
 Presented by Royal Botanic Garden Edinburgh

PIANO DISSECTION LIVE



2PM-5PM | DROP-IN | FREE (DONATIONS WELCOME)
 INVERLEITH HOUSE
 Join the #Pianodrome team as they disassemble one of the 52 pianos they will use to build their upcycled piano amphitheatre, with live commentary by the makers and musical interludes throughout. Appreciate the meticulous workmanship and centuries' worth of innovation which has gone into creating each one of these complex and beautiful machines.
 Presented by Royal Botanic Garden Edinburgh

DYNAMIC EARTH

MEET THE POLAR SCIENTISTS



10AM-4PM | DROP-IN | ALSO ON MON 9 APRIL
 FREE WITH ADMISSION (NO BOOKING REQUIRED)
 STRATOSPHERE
 Have you ever wondered what it's like to live and work in the polar regions of Earth? Come along to meet polar scientists from Edinburgh's universities whose research helps us understand how our planet works - and how it's changing - through living and working in some of the most beautiful, yet hostile, environments in the world. You can expect lots of exciting hands-on activities and demonstrations that will leave you feeling inspired.
 Presented by Dynamic Earth

AROUND EDINBURGH

RECURRING EVENTS

- 10AM-5PM | ECO2VILLE | P.13
- 3PM | DR BUNHEAD'S EASTER EGG OF DOOM | P.21

WATER OF LEITH DEBRIS DISCOVERY DAY



10.30AM | 3.5 HOURS | FREE (BOOKING REQUIRED)
 WATER OF LEITH VISITOR CENTRE
 Swap the sweaty crowds of Princes Street for the cool glades of the Water of Leith. Get your hands and feet wet and join in the launch of the Water of Leith Conservation Trust 2018 Spring Clean Up of Edinburgh's river. Find out what lurks in one of Edinburgh's natural wonders, then hear a tale by storyteller **Alette Willis**. Wellies or sturdy shoes needed. Gloves, litter pickers and recycling stations will be provided.
 Presented by Water Of Leith Conservation Trust



Scotland's young people are shining in 2018

2018 puts Scotland's young people in the spotlight, celebrating their talents and contributions as well as providing opportunities for them and their families to get involved in a variety of exciting activities across the country in celebration of the Year of Young People 2018.

EventScotland is delighted to be supporting Edinburgh International Science Festival to further encourage young minds to explore the world they live in during this special year. Share your stories #YOYP2018

Find out more at visitscotland.com/yoyp2018

Scotland
The Perfect Stage



year of young people
bliadhna na h-òigridh
2018

VISITSCOTLAND.COM

**Come and discover
the world's best
theatre and dance
for children and
young people**

Edinburgh International
**Children's
Festival**
26 MAY – 3 JUNE 2018



**Opening weekend
(26 – 27 May) at National
Museum of Scotland**

Free pop-up performances, live
music and arts activities

Booking opens 22 March

www.imagine.org.uk

CITY ART CENTRE



RECURRING EVENTS

9.30AM-4.30PM | CITY ART CENTRE | P.9-10

During the Science Festival we transform City Art Centre's gallery spaces into a sensational science playground, packed full of workshops, shows and interactive events. Day Pass required.

NATIONAL MUSEUM OF SCOTLAND

RECURRING EVENTS

10AM-4.30PM | ROBOT LAB | P.20

10AM-4.30PM | HOW OLD ARE YOU REALLY? | P.20

10AM-4.30PM | POP-UP ENGINEERING | P.20

10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.12

10AM-5PM | POP-UP SCIENCE | P.19

10.30AM + 2PM | SPARK CART SCIENCE | P.14

MAKE A MONSTER



10.30AM | 90 MINS | £15

LEARNING CENTRE LEVEL 4, SEMINAR ROOM

Meet some of the strangest animals that exist on our planet and learn how biodiversity and adaptation help them to survive. Inspired by these weird creatures, you'll design and make your very own monster from recycled materials. We'll also help you to capture a photograph of your monster in its natural habitat using our custom Monster Photobooth! *Accompanying adults wishing to take part will require a ticket.*

Presented by Howling Mouse Workshop

AMAZING IMMUNOLOGY



12.00 PM | 1 HOUR | ON UNTIL THU 12 APRIL | £5

LEARNING CENTRE LEVEL 4, STUDIO 2

Denny and the T-Team are back with new discoveries! Get active and crafty with new games that explain how your body's immune cells protect you from disease and keep you healthy. Play the ball pool challenge to discover how future treatments for cancers might work, and make your own science sticker stories to take home. For ages 7-13. *Each ticket admits one adult if desired.*

Presented by The University of Edinburgh

NATIONAL MUSEUM OF SCOTLAND

A CODING ADVENTURE WORKSHOP!



AGES 7+ WORKSHOP

1.30PM | 2 HOURS | £15

LEARNING CENTRE LEVEL 4, SEMINAR ROOM

Learn how to code your own animations, get a sneak peek of a new computer coding show and discover how Scratch code is used to create animations. Then it's time to get hands-on as you complete a series of coding missions using original artwork and sounds from the show, before sitting back to enjoy a special screening of your work. This workshop is perfect for total beginners or those who want to further their knowledge. Come as a team of three or meet your new teammates on the day. *It is preferred that adults leave children at the start of this event and collect them at the end. Accompanying adults wishing to take part will require a ticket.*

Presented by Howling Mouse Workshop

RZSS EDINBURGH ZOO

RECURRING EVENTS

10AM-5PM | ZOO TRAIL: HATCH FEST | P.12

BUILD YOUR OWN ZOO



AGES 5+ ACTIVITY

11AM-3PM | DROP-IN | ON UNTIL THU 12 APRIL

FREE WITH ADMISSION (NO BOOKING REQUIRED)

BUDONGO TRAIL

Build your own zoo! Create clay model animals and learn how to animate them to make your very own zoo films. You will also get the chance to be amongst the first visitors to try out a digital video game designed exclusively for RZSS Edinburgh Zoo.

Presented by RZSS Edinburgh Zoo

SUMMERHALL

CAPTURE THE SUN WITH A SIX-MONTH PINHOLE CAMERA



AGES 10+ WORKSHOP

10AM, 11.30AM, 1.30PM AND 3PM | 1 HOUR | £15

DISSECTION ROOM

Learn how to make a super-long-exposure pinhole camera from an aluminium can with science-inspired artist **Nick Sayers**. Using this camera, you can take a six-month 'solargraph' photograph of sun tracks passing over a landscape - your house, for example - from winter to summer. Nick will explain the art and science behind the project and show you some of his own photos. *Accompanying adults wishing to take part will require a ticket.*

Presented by Nick Sayers

THE ZOOM CLUB: ANIMATION LAB AGES 8+



AGES 8+ WORKSHOP

10.30AM-3.30PM | 5 HOURS | £40 | THE ZOOM CLUB

Join us in The Zoom Club's innovative *Animation Lab* where you can explore moving image using traditional and digital techniques. We'll uncover how animation really works and help you find the perfect technique to share your own stories and ideas. Please note: strobe lighting will be used during this workshop. *Bring a packed lunch. Parent/guardian supervision is not required.*

Presented by The Zoom Club

THE EXPERIMENTARIUM



11 AM-4PM | DROP-IN | ON UNTIL FRI 13 APRIL | FREE | SUMMERHALL | MAIN HALL

The Experimentarium returns for Science Festival 2018, packed full of weird, wonderful and cutting-edge science. Step into an amazing laboratory filled with hands-on activities and interactives for all ages. Browse individual event listings below or find out more at sciencefestival.co.uk.

ROYAL BOTANIC GARDEN EDINBURGH

RECURRING EVENTS

10AM–5PM | #PIANODROME RESONANCY | P.20
 11AM–4PM | NATURE OF FOOD | P.21
 11AM + 2PM | ME AND MY BEE | P.22

WILD ABOUT SCOTLAND BUS



AGES 3+
ACTIVITY

11AM–4.30PM | DROP-IN | ALSO ON AT ROYAL BOTANIC GARDENS: TUE 10 APRIL | EDINBURGH ZOO: WED 11 APRIL
 SUMMERHALL: THU 12–FRI 13 APRIL
 NORTH EDINBURGH ARTS: SAT 14 APRIL | FREE

Hop on board the *Wild about Scotland* double-decker bus to find out all about Scottish biodiversity and RZSS native conservation projects. Have a go at identifying Scottish wildcats, building a beaver dam and guessing the animal skulls. The bus will visit different venues around Edinburgh throughout the festival. Hop on board at Royal Botanic Gardens of Edinburgh, Summerhall, North Edinburgh Arts and the Zoo. Presented by RZSS Edinburgh Zoo

DYNAMIC EARTH

RECURRING EVENTS

10AM–4PM | MEET THE POLAR SCIENTISTS | P.22

WONDERFUL WEATHER: FAMILY FUN IN THE OUTDOORS



AGES 6+
ACTIVITY

10.30AM AND 1.30PM | 2 HOURS | ALSO ON TUE 10 APRIL
 FREE WITH ADMISSION (BOOKING REQUIRED)

This is your chance to be a weather detective in Holyrood Park! Budding young meteorologists and their families can join the Dynamic Earth Learning Team to explore local spaces and learn how to read the skies, look for clues in nature, figure out forecasts and investigate our wonderful Scottish weather. You'll get the chance to complete a weather map, take part in our cloud spotting challenge and celebrate the elements. Wear sturdy shoes and bring waterproofs to this outdoor event. Meet at Dynamic Earth.

Presented by Dynamic Earth

AROUND EDINBURGH

RECURRING EVENTS

9AM–4PM | POWER TRIP | P.13
 10AM–5PM | ECOVILLE | P.13
 12PM–4PM | PILOT TRAINING SCHOOL | P.15



EXPERIMENTARIUM

AIR POLLUTION – OUR SILENT PROBLEM



ALL AGES
ACTIVITY

Air pollution can affect our heart and circulatory system. Join British Heart Foundation Scotland for some interactive activities that will help you find out more. Walk along Air Street to discover pollution's effects on your body, learn about city smog, watch heart cells beating and discover some of the technology used by heart scientists and researchers. Presented by British Heart Foundation Scotland

CREATING COMMUNICATION



ALL AGES
ACTIVITY

Language exists in every human society, and no other species communicates in such a complex way. How and why are we the only species that speaks? Learn how experimental games can shed light on how human language evolved. Play a simple cell trying to evolve, shape a new language in virtual reality, or gesture your way to meaningful communication. Presented by The University of Edinburgh

ROBOT-ASSISTED SURGERY



ALL AGES
ACTIVITY

Discover how robot assistants can help you perform keyhole surgery! You'll find demonstrations and explanations to help you find out about what it feels like to be a surgeon. You'll even have the chance to try out the laparoscopy training box, watching how robots can help make moving surgical instruments more accurate and precise. Presented by Heriot-Watt University

OUR OUTDOORS – HOW HEALTHY ARE PUBLIC OUTDOOR SPACES?



ALL AGES
ACTIVITY

Good quality outdoor spaces are important for health and wellbeing. However, there is still a lot we don't know about who benefits from these spaces and why. Come get creative by building and becoming immersed in outdoor spaces. Become a citizen scientist and engage in learning about how the outdoor environments in which we share and spend time can impact our health. Presented by the Scottish Collaboration for Public Health Research and Policy (SCPHRP), University of Edinburgh

21ST CENTURY BRAIN



ALL AGES
ACTIVITY

Your brain is the most complex structure in the Universe, responsible for everything you think, feel, say and do. But what happens if it goes wrong? Join Alzheimer's Research UK to explore this incredible organ and find out how it is affected in dementia, with a range of creative activities, virtual reality experiences and challenging brain games. Presented by Alzheimer's Research UK

FOOD DISCOVERY ZONE



ALL AGES
ACTIVITY

Join Food Standards Scotland in *The Experimentarium* for an interactive journey to explore the foods you eat, and to discover how the foods you choose to consume may affect your health and wellbeing in current and later life. Journey through our kitchen crime scene to explore the most common 'kitchen crimes' and see how bacteria can grow and spread through human connection. Presented by Food Standards Scotland

CITY ART CENTRE



RECURRING EVENTS

9.30AM-4.30PM | CITY ART CENTRE | P.9-10

During the Science Festival we transform City Art Centre's gallery spaces into a sensational science playground, packed full of workshops, shows and interactive events. Day Pass required.

NATIONAL MUSEUM OF SCOTLAND

RECURRING EVENTS

10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.12

10AM-5PM | POP-UP SCIENCE | P.19

10.30AM + 2PM | SPARK CART SCIENCE | P.14

12PM | AMAZING IMMUNOLOGY | P.24

BIO-DISCOVERIES



ALL AGES
ACTIVITY

10AM-4.30PM | DROP-IN | ON UNTIL SAT 14 APRIL | FREE LEARNING CENTRE LEVEL 2

Meet a team of biologists from The University of Edinburgh to find out what new things they've discovered over the past year about animals, plants and other living things. Then get hands-on and make some exciting discoveries for yourself under the microscope.

Presented by The University of Edinburgh

MATHS: THE ALPHABET OF THE UNIVERSE



ALL AGES
ACTIVITY

10AM-4.30PM | DROP-IN | ON UNTIL SAT 14 APRIL | FREE LEARNING CENTRE LEVEL 2

The Italian mathematician Galileo said '*mathematics is the alphabet in which God has written the Universe*'. Come and explore some of the mathematical rules of nature and discover how our cells stick together. Find out how mathematics can help us predict the future of our planet, then make your own predictions. Create your own model of a mini-Universe and consider the shape of planets, our galaxy, and the whole Universe.

Presented by The University of Edinburgh

NATIONAL MUSEUM OF SCOTLAND

SPACE LAB



ALL AGES
ACTIVITY

10AM-4.30PM | DROP-IN | ON UNTIL SAT 14 APRIL | FREE LEARNING CENTRE LEVEL 2

Come on a space journey to Planet X with chemists from The University of Edinburgh to discover what materials and technologies are needed to build and power a chemistry lab on another planet. Get hands-on with analysis of this alien environment using real chemistry experiments. You'll have the chance to use electrochemical sensors and spectrometers to investigate soil, water and atmospheric samples, as well as looking into the microscope to observe living (alien?) cells.

Presented by The University of Edinburgh

SUMMERHALL

RECURRING EVENTS

11AM-4PM | THE EXPERIMENTARIUM | P.24-25

ENSONGLOPEDIA OF ANIMALS



AGES 5+
SHOW

11AM | 75MINS | £4/£3.50 EACH FOR 3+ TICKETS

DISSECTION ROOM

Meet 26 animals - one for each letter of the alphabet, and all 26 through the medium of silly song! Learn fascinating facts about extraordinary echinoderms, distressed damselflies, crazy corals, batty beetles and amazing arachnids. This is a work-in-progress performance by **John Hinton**, the writer and performer of a string of award-winning science theatre shows. The performance will be followed by a feedback session, which is your chance to help him shape his piece in time for the premier of this show in late April.

THE ELEMENT IN THE ROOM



AGES 7+
SHOW

3PM | 70MINS | £6/£5 EACH FOR 3+ TICKETS

DISSECTION ROOM

A radioactive musical comedy about the death and life of Marie Curie, arguably the most important woman in science. She discovered two chemical elements, won two Nobel prizes, pioneered the use of X-rays and made significant contributions to the search for a cure for cancer, all in the face of prejudice and personal tragedy. **John Hinton's** musical comedy - part of his multi-award-winning scientirilogy - tells her incredible life story, including breathtaking breakthroughs, exhilarating experiments and seriously silly songs.

Presented by Tangram Theatre Company

RZSS EDINBURGH ZOO

RECURRING EVENTS

10AM-5PM | ZOO TRAIL: HATCH FEST | P.12

11AM-3PM | BUILD YOUR OWN ZOO | P.24

ROYAL BOTANIC GARDEN EDINBURGH

RECURRING EVENTS

10AM-4.30PM | WILD ABOUT SCOTLAND BUS | P.25

10AM-5PM | #PIANODROME RESONANCY | P.20

11AM + 2PM | ME AND MY BEE | P.22

11AM-4PM | NATURE OF FOOD | P.21

DYNAMIC EARTH

RECURRING EVENTS

10.30AM + 1.30PM | WONDERFUL WEATHER | P.25

MEET THE MARINE SCIENTISTS



AGES 5+
ACTIVITY

10AM-4PM | DROP-IN | FREE WITH ADMISSION

STRATOSPHERE

Join marine scientists from Heriot-Watt University to get up-close and personal with some wee sea beasts from around our shores and discover how we can find out more about the animals that live thousands of metres below the ocean surface. You'll learn how we can use the buried skeletons of marine plants and animals to understand how the ocean environment changes over time and find out how research is helping scientists to better protect our marine environment from damaging human activities.

Presented by Dynamic Earth

AROUND EDINBURGH

RECURRING EVENTS

9AM-4PM | POWER TRIP | P.13

10AM-5PM | ECQVILLE | P.13

12-4PM | PILOT TRAINING SCHOOL | P.15

WEDNESDAY 11 APRIL

CITY ART CENTRE



RECURRING EVENTS

9.30AM-4.30PM | CITY ART CENTRE | P.9-10

During the Science Festival we transform City Art Centre's gallery spaces into a sensational science playground, packed full of workshops, shows and interactive events. Day Pass required.

NATIONAL MUSEUM OF SCOTLAND

RECURRING EVENTS

10AM-4.30PM | BIO-DISCOVERIES | P.26

10AM-4.30PM | MATHS: THE ALPHABET OF THE UNIVERSE | P.26

10AM-4.30PM | SPACE LAB | P.26

10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.12

10.30AM + 2PM | SPARK CART SCIENCE | P.14

12PM | AMAZING IMMUNOLOGY | P.24

POP-UP SCIENCE: SCI-FUN ROADSHOW

ALL AGES



10AM - 5PM | DROP-IN | ON UNTIL SUN 15 APRIL
FREE | HAWTHORNDEN COURT

Join the fun at this interactive mobile science centre, featuring many incredible activities. The power bike challenge, visual illusions, the magic screen, a human circuit, and 'relaxing' in a spinning chair... there's truly something for everyone. Pop in for a moment - stay for hours!
Presented by The University of Edinburgh

UP UP AND AWAY!

AGES 7+



10.30AM, 12PM AND 2PM | 75 MINS | £15

LEARNING CENTRE LEVEL 4, SEMINAR ROOM

Design and make your own kite in this workshop and learn about the role of gravity and aerodynamics in making it fly! *Accompanying adults wishing to take part will require a ticket.*

Presented by Go Fly Your Kite

NATIONAL MUSEUM OF SCOTLAND

SUPERHERO SCIENCE SHOW

AGES 5+



12.00 PM AND 2.30PM | 45MINS

£3/£2.50 EACH FOR 3+ TICKETS | AUDITORIUM

Are you a superhero scientist in the making? This live show will explore how real objects from the National Museum of Scotland have given us all super powers. Discover the science behind energy transfers, infrared technology and learn about how people just like you might discover the super powers of the future.

Presented by the National Museum of Scotland

SUMMERHALL

RECURRING EVENTS

11AM-4PM | THE EXPERIMENTARIUM | P.24-25

LICKETYPLAY!

AGES 3+



10AM AND 12PM | 90 MINS | £6/£5 EACH FOR 3+ TICKETS

THE MEADOWS

A chance for families to sample Licketyspit's wonderful Playcard Repertoire of hilarious games, rhymes, songs and imaginary play! The Licketyspit actor-pedagogues will lead an hour of games at the Meadows followed by reflective drawing and a biscuit at Summerhall. Please meet at the reception at Summerhall to begin. Also 3pm performance at North Edinburgh Arts, limited tickets available, see sciencefestival.co.uk for details.

Presented by Licketyspit Theatre Company

DOCTOR BOOK

ALL AGES



12PM-3PM | DROP-IN | FREE | CAFÉ

Stuck for something to read? Just finished a great book and looking for something new? Looking for new and exciting authors to explore? Craigmillar Literacy Trust and Craigmillar Book Festival's Doctor Book will be on hand to dispense advice and suggestions to cure all your reading ailments. You'll even get your own reading prescription to take away with you. No appointments necessary and suitable for children of all ages and their parents or carers.

Presented by Craigmillar Literacy Trust and Craigmillar Book Festival

Image: Kirsty McLachlan

RZSS EDINBURGH ZOO

RECURRING EVENTS

10AM-5PM | ZOO TRAIL: HATCH FEST | P.12

11AM-3PM | BUILD YOUR OWN ZOO | P.24

11AM-4.30PM | WILD ABOUT SCOTLAND BUS | P.25

DIGITAL ZOO

AGES 5+



11AM-3PM | DROP-IN | ALSO ON THU 12 APRIL

FREE WITH ADMISSION | BUDONGO TRAIL

Have a play with the latest digital technologies which can bring the unseen to life! Discover how RZSS Edinburgh Zoo is experimenting with augmented and virtual reality to tell the stories of the Zoo and its conservation projects around the world.

Presented by RZSS Edinburgh Zoo

ROYAL BOTANIC GARDEN EDINBURGH

RECURRING EVENTS

10AM-5PM | #PIANODROME RESONANCY | P.20

11AM + 2PM | ME AND MY BEE | P.22

11AM-4PM | NATURE OF FOOD | P.21

DYNAMIC EARTH

RECURRING EVENTS

10AM-4PM | OPERATION EARTH | P.13

AROUND EDINBURGH

RECURRING EVENTS

9AM-4PM | POWER TRIP | P.13

10AM-5PM | ECQVILLE | P.13

12PM-4PM | PILOT TRAINING SCHOOL | P.15

2PM | HEART DISSECTION FOR KIDS! | P.17

URBAN EXPLORATION

AGES 11+



11AM | 90 MINS | £3 | JUBILEE GARDENS

Take some time to stop and smell the flowers. Getting out into nature can be of great benefit, but how far do you have to go to find it? Join the Water of Leith Conservation Trust for a stroll along the water and discover just how much nature is hidden in our urban environment. N.B. Come dressed for the weather!

Presented by Water of Leith Conservation Trust

BOOKING HOTLINE: 0844 557 2686

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK

CITY ART CENTRE



RECURRING EVENTS

9.30AM-4.30PM | CITY ART CENTRE | P.9-10

During the Science Festival we transform City Art Centre's gallery spaces into a sensational science playground, packed full of workshops, shows and interactive events. Day Pass required.

NATIONAL MUSEUM OF SCOTLAND

RECURRING EVENTS

10AM-4.30PM | BIO-DISCOVERIES | P.26

10AM-4.30PM | MATHS: THE ALPHABET OF THE UNIVERSE | P.26

10AM-4.30PM | SPACE LAB | P.26

10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.12

10AM-5PM | POP-UP SCIENCE | P.27

10.30AM + 2PM | SPARK CART SCIENCE | P.14

12PM | AMAZING IMMUNOLOGY | P.24

CODING WITH THE MICRO:BIT



10.30AM AND 2PM | 2 HOURS | £15

LEARNING CENTRE LEVEL 4, SEMINAR ROOM

Calling all budding inventors! This is not just another coding workshop, this class is a hands-on workshop using the Micro:bit, pocket sized computer! It's simple to get started, incredibly versatile and awesomely powerful. Unleash your potential as you learn how to create emoticon displays, games and coded messages and use your new skills and digital creativity to invent solutions to real world problems. *Accompanying adults wishing to take part require a ticket. It is preferred that adults leave their children and collect them at the end.*

Presented by ComputerXplorers

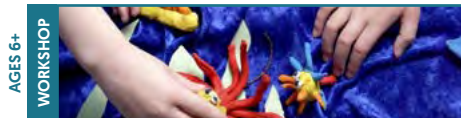
SUMMERHALL

RECURRING EVENTS

11AM-4PM | THE EXPERIMENTARIUM | P.24-25

11AM-4.30PM | WILD ABOUT SCOTLAND BUS | P.25

THE ZOOM CLUB: ANIMATION LAB AGES 6+



AGES 6+ WORKSHOP

10.30AM-3.30PM | 5 HOURS | £40 | THE ZOOM CLUB

Join us in The Zoom Club's innovative *Animation Lab* where you can explore moving image using traditional and digital techniques. We'll uncover how animation really works and help you find the perfect technique to share your own stories and ideas. Please note: strobe lighting will be used during this workshop. *Bring a packed lunch. Parent/guardian supervision is not required.*

Presented by The Zoom Club

THE ORNITHOPTER



AGES 11+ SHOW

10.30AM-3PM | HALF HOURLY (NOT 12.30 OR 1PM) | £2 BASEMENT GALLERIES

An inventor dreams of touching the sun, reaching space and landing on the moon. And he's invented six thousand ways how not to do it. But now he thinks he has found a way that will actually work. Can he escape his dreary life and soar amongst those magnificent men in their flying machines? Is he brave enough to jump? Fly or Fall, there's only one way to find out. Join us for a breathtaking, 20-minute, work-in-progress, promenade performance.

Presented by Tortoise in a Nutshell in association with Edinburgh International Science Festival, Summerhall and Grid Iron. With support from The Royal Edinburgh Military Tattoo and the City of Edinburgh Council's Culture Project Fund

THE WORM: AN UNDERGROUND ADVENTURE



AGES 3+ SHOW

11AM (RELAXED PERFORMANCE) AND 2PM | 1 HOUR £6/£5 EACH FOR 3+ TICKETS | DISSECTION ROOM

Underneath your feet in the muddy brown soil squirms the world's best-kept secret... a wonderful, magical creature called the Worm. Join Wilma and William, two nature lovers, on a journey underground as they discover a family of friendly, musical worms and their colourful miniature world. Sit on the grass as the adventure unfolds, involving charming finger puppetry, colourful bobble hats, live cello music and laugh-out-loud songs. After the performance, you'll be invited to meet some real worms in a specially-designed wormery.

Presented by Eco Drama

RZSS EDINBURGH ZOO

RECURRING EVENTS

10AM-5PM | ZOO TRAIL: HATCH FEST | P.12

11AM-3PM | BUILD YOUR OWN ZOO | P.24

11AM-3PM | DIGITAL ZOO | P.27

ROYAL BOTANIC GARDEN EDINBURGH

RECURRING EVENTS

10AM-5PM | #PIANODROME RESONANCY | P.20

11AM-4PM | NATURE OF FOOD | P.21

DYNAMIC EARTH

RECURRING EVENTS

10AM-4PM | OPERATION EARTH | P.13

6PM | DOUBLE DOME NIGHTS | P.15

AROUND EDINBURGH

RECURRING EVENTS

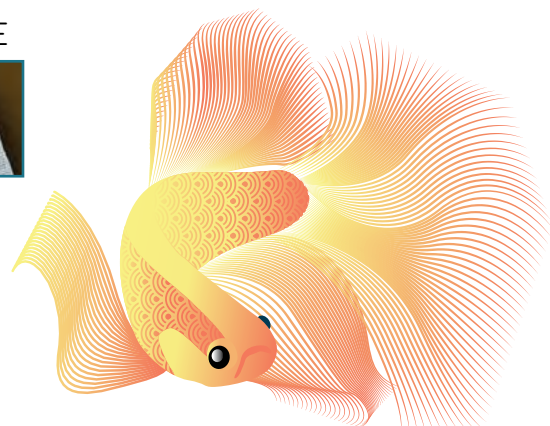
9AM-4PM | POWER TRIP | P.13

10AM + 2PM | MAKE TIME FAMILY WORKSHOP | P.18

10AM-5PM | ECOVILLE | P.13

12PM-4PM | PILOT TRAINING SCHOOL | P.15

2PM | HEART DISSECTION FOR KIDS | P.17



FRIDAY 13 APRIL

CITY ART CENTRE



RECURRING EVENTS

9.30AM-4.30PM | CITY ART CENTRE | P.9-10

During the Science Festival we transform City Art Centre's gallery spaces into a sensational science playground, packed full of workshops, shows and interactive events. Day Pass required.

NATIONAL MUSEUM OF SCOTLAND

RECURRING EVENTS

10AM-4.30PM | BIO-DISCOVERIES | P.26

10AM-4.30PM | MATHS: THE ALPHABET OF THE UNIVERSE | P.26

10AM-4.30PM | SPACE LAB | P.26

10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.12

10AM-5PM | POP-UP SCIENCE | P.27

ELECTRONIC MUSIC WORKSHOP: INTRODUCTION



10.30AM | 90 MINS | £15

LEARNING CENTRE LEVEL 4, STUDIO 1

Find out how electronic circuits make noise and build some of your own. You'll learn how to solder components to a small circuit board, which is shaped like a set of bagpipes. When the circuit is complete, your new gadget will play a little tune. No previous experience required.

Accompanying adults wishing to take part require a ticket.

Presented by MadLab

NATIONAL MUSEUM OF SCOTLAND

GAME DESIGN USING XBOX CONTROLLERS



AGES 8+ WORKSHOP

10.30AM AND 2PM | 2 HOURS | £15

LEARNING CENTRE LEVEL 4, SEMINAR ROOM

Using an Xbox controller, learn how to create and design your very own video game. Create a range of terrains, worlds and characters, controlling the characters' movement, sound and vision using an intuitive icon-based programming language. Don't just play games, create them yourself in this gamers' workshop! *Accompanying adults wishing to take part require a ticket. It is preferred that adults leave their children and collect them at the end.*

Presented by ComputerExplorers

ELECTRONIC MUSIC WORKSHOP: INTERMEDIATE



AGES 11+ WORKSHOP

2PM | 90 MINS | £15

LEARNING CENTRE LEVEL 4, STUDIO 1

Find out how electronic circuits make noise and build some of your own. Using a soldering iron to create your circuit, you'll build a synthesiser in the shape of a guitar that uses a microcontroller and the Karplus-Strong algorithm to simulate the sound of a plucked guitar string. Previous soldering experience is required. *Accompanying adults wishing to take part require a ticket.*

Presented by MadLab

SUMMERHALL

RECURRING EVENTS

11AM-4PM | THE EXPERIMENTARIUM | P.24-25

11AM-4.30PM | WILD ABOUT SCOTLAND BUS | P.25

FAMILY STORY TIME



AGES 3+ SHOW

10.30AM, 12PM AND 2.30PM | 50 MINS

£6/£5 EACH FOR 3+ TICKETS | DISSECTION ROOM

Ideal for young people aged 3-7 and their families, this delightful interactive theatre performance looks at the science bits inside some well-known stories. Will the Wee Experts solve the science problems and learn something new? Join us for an adventure with Scottish Youth Theatre and find out what happens when they set out to discover the wonderful world of science in the story of *The Elves and the Shoemaker*.

Presented by Scottish Youth Theatre

RZSS EDINBURGH ZOO

RECURRING EVENTS

10AM-5PM | ZOO TRAIL: HATCH FEST | P.12

BUDONGO RESEARCH UNIT AND LIVING LINKS STALL



AGES 3+ ACTIVITY

11AM-3PM | DROP-IN | FREE WITH ADMISSION

(NO BOOKING REQUIRED) | BUDONGO TRAIL

Learn about the new upgrades to the Budongo Trail building, Edinburgh Zoo's innovative and interactive chimpanzee enclosure. Find out more about the research that the Zoo's team is conducting with chimps and in the Living Links research centre with monkeys.

Presented by RZSS Edinburgh Zoo

ROYAL BOTANIC GARDEN EDINBURGH

RECURRING EVENTS

10AM-5PM | #PIANODROME RESONANCY | P.20

10AM | GEODOME WORKSHOP | P.20

11AM-4PM | NATURE OF FOOD | P.21

2PM | INSTRUMENT MAKING WORKSHOP | P.20

DYNAMIC EARTH

RECURRING EVENTS

10AM-4PM | OPERATION EARTH | P.13

6PM | DOUBLE DOME NIGHTS | P.15

AROUND EDINBURGH

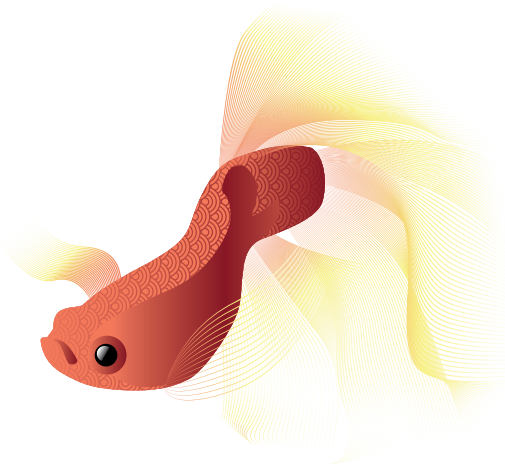
RECURRING EVENTS

9AM-4PM | POWER TRIP | P.13

10AM + 2PM | MAKE TIME FAMILY WORKSHOPS | P.18

10AM-5PM | ECOVILLE | P.13

12PM-4PM | PILOT TRAINING SCHOOL | P.15



BOOKING HOTLINE: 0844 557 2686

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK

CITY ART CENTRE



RECURRING EVENTS

9.30AM-4.30PM | CITY ART CENTRE | P.9-10

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NATIONAL MUSEUM OF SCOTLAND

RECURRING EVENTS

10AM-4.30PM | BIO-DISCOVERIES | P.26

10AM-4.30PM | MATHS: THE ALPHABET OF THE UNIVERSE | P.26

10AM-4.30PM | SPACE LAB | P.26

10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.12

10AM-5PM | POP-UP SCIENCE | P.27

KINETIC SCULPTURE WORKSHOP



AGES 7+
WORKSHOP

10.30AM AND 2PM | 2.5 HOURS

£39 FOR 3/£52 FOR 4

LEARNING CENTRE LEVEL 4, STUDIO 1

A kinetic sculpture is a machine that moves in some way and you will love working together in a team to make one! What your kinetic sculpture does is entirely up to you - it could be practical, or just plain whimsical. Electronics, motors, lights and craft materials will be provided and there will be people on hand to help you bring your ideas to life. Feel free to bring your own old toys or equipment to 'cannibalise for your creation'. Some coding is involved so experience in this area is useful but not essential.

This workshop hosts up to five teams of three to four people. Participants make one sculpture per team. Although we appreciate that it is not always possible, booking for three people is recommended, so you don't have to split the sculpture.

Presented by MadLab

RZSS EDINBURGH ZOO

RECURRING EVENTS

10AM-5PM | ZOO TRAIL: HATCH FEST | P.12

11AM-3PM | ZOO ORIENTEERING | P.12

11AM-3PM | PRIMATES STALL | P.13

ROYAL BOTANIC GARDEN EDINBURGH

RECURRING EVENTS

10AM-5PM | #PIANODROME RESONANCY | P.20

WHAT IS A #PIANODROME?

ALL AGES
ACTIVITY



2-5PM | DROP-IN | FREE (DONATIONS WELCOME)

INVERLEITH HOUSE

In Summer 2018 artist **Tim Vincent-Smith** and his team will be building an amphitheatre entirely from discarded pianos inside the Royal Botanic Garden Edinburgh. There's one thing we are sure of - the #Pianodrome will be nothing without a buzzing creative community around it. You are invited to attend an action-packed afternoon exploring the potential uses of this incredible space. With live music, an interview with the makers, drop-in workshops and interactive installations.

Presented by Royal Botanic Garden Edinburgh

DYNAMIC EARTH

MEET THE FOREST SCIENTISTS

AGES 5+
ACTIVITY



10AM-4PM | DROP-IN | ALSO ON SUN 15 APRIL

FREE WITH ADMISSION | STRATOSPHERE

Forests regulate our climate and provide us with fresh water, medicines and food. They are extremely diverse and home to many different species, but as the human population grows they are under increasing pressure. Join **Dr Murray Collins** from The University of Edinburgh to discover the latest satellite technology that is being used to measure deforestation. You'll see images taken by European Space Agency satellites and photographs from tropical forests around the world, as well as finding out how satellite data and virtual reality technology is being used in forest management in Scotland.

Presented by Dynamic Earth

AROUND EDINBURGH

RECURRING EVENTS

10AM-4PM | POWER TRIP | P.13

10AM-5PM | ECOVILLE | P.13

11AM-4.30PM | WILD ABOUT SCOTLAND BUS | NORTH EDINBURGH ARTS | P.25

FAMILY DAY AT HERIOT-WATT



ALL AGES
SPECIAL EVENT

10AM-4PM | DROP-IN | FREE

HERIOT-WATT UNIVERSITY, ORIAM

Get hands-on with cutting edge research at Heriot-Watt. As part of Heriot-Watt's Year of the Sea, we will transform Oriam, Scotland's National Performance Centre for Sport, into an underwater world, creating a day packed with workshops and interactive events. Drive your own underwater robot, take a virtual reality tour as microbes cleaning up oil spills, explore how our scientists work with light and sound and much more! Out-of-the-sea activities will include robot construction, froth, foam and bubbles and creating your own blueprint. As well as getting messy and creative, you can take part in a series of scientific challenges to unlock our underwater world, winning prizes as you go.

Supported by



WILD DAY OUT



AGES 5+
ACTIVITY

10AM-4PM | DROP-IN | FREE

HOLYROOD PARK EDUCATION CENTRE

Discover your wild side and join Historic Environment Scotland and RSPB Scotland to explore the wild terrain of Holyrood Park and meet the mini-beasts that call it their home. We will be hosting Edinburgh's very first Worm Charming Championship alongside a range of fun and family-friendly activities including mini-beast hunts, making seedbombs and the chance to take a closer look at what you have discovered in our nature science lab. Then put on your explorer hat and follow our Historic Scotland Rangers as they show you their favourite spots on Arthur's Seat and some of the amazing wildlife and archaeology that can be found there. *Moderate level of fitness, outdoor clothing and sturdy footwear required for activities.*

Presented by RSPB Scotland and Historic Environment Scotland

SUNDAY 15 APRIL

NATIONAL MUSEUM OF SCOTLAND

RECURRING EVENTS

10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.12
 10AM-5PM | POP-UP SCIENCE | P.27

RZSS EDINBURGH ZOO

RECURRING EVENTS

10AM-5PM | ZOO TRAIL: HATCHFEST | P.12
 11AM-3PM | CAMERA TRAP STALL | P.12
 11AM-3PM | ZOO POPULATIONS STALL | P.12
 11AM-3PM | ZOO ORIENTEERING | P.12

DYNAMIC EARTH

RECURRING EVENTS

10AM-4PM | MEET THE FOREST SCIENTISTS | P.30

AROUND EDINBURGH

RECURRING EVENTS

10AM-5PM | ECOVILLE | P.13

SUMMERHALL

EDINBURGH MINI MAKER FAIRE 2018

ALL AGES
 SPECIAL EVENT



10AM-5PM | DROP-IN | £6/FREE UNDER 3 | SUMMERHALL



The *Mini Maker Faire* is a gathering of creators from Edinburgh and beyond who will showcase the things they make and do. From engineers to artists to scientists to crafters, Maker Faire is a chance for these 'makers' to show off hobbies, experiments, projects and ideas.

Expect to find creative minds at work showing the inner workings of things like electronic moving toys, wind-powered automata, maths-inspired tableware and homemade personal transport.

Come along to see the ingenuity and creativity coming out of local maker spaces, be inspired to make your own creations and get tips and tricks from those in the know.

Make:
 makezine.com

Edinburgh Mini Maker Faire is independently organised and operated under licence from Maker Media Inc

Supported by



BOOKING HOTLINE: 0844 557 2686

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK

LIFE. THE UNIVERSE AND EVERYTHING

'The internal machinery of life, the chemistry of the parts, is something beautiful. And it turns out that all life is interconnected with all other life.'

Richard Feynman, Physicist

In 2018, our 30th edition, Edinburgh International Science Festival celebrates the wonder and diversity of life, exploring our existence and our potential. Join us from 31 March-15 April as we examine the building blocks of the world our young people will inherit and ask how we can ensure the future of life on Earth – and beyond? – is a bright one.

EARLY BIRD OFFER

Buy four tickets for events across our adult programme and receive your fifth ticket free.



Cheapest ticket free, valid for five separate events only. Early Bird Tickets can be booked by phone or in person only. The Early Bird Offer closes on Monday 26 March.

SCIENCE FESTIVAL BEER

A special Science Festival brew from our friends at Barney's Beer has become a regular (and delicious!) annual tradition. Try this year's beer at selected events or join Barney himself at his Summerhall brewery for a practical demonstration of the three principle processes of brewing on Thursday 5 and Friday 6 April (p.44).



AGE RESTRICTIONS

Our adult programme is designed for visitors aged 14+. This is a recommendation only and younger visitors are very welcome. Please note that a small number of events have an enforced age limit of 18+ and these will be marked with 'AGES 18+'. This restriction is in place due to event content and/or venue licensing laws. For these events, identification will be required and under 18s will not be admitted under any circumstances.

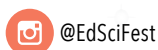
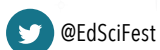
#SCIFIVE

Are you sci-curious? Students and teachers can explore *Life, the Universe and Everything* with tickets for just £5 at most Science Festival 2018 events – everything from engaging workshops and discussions to a great night out!

Look out for the #scifive tag as you browse event listings and follow us on Twitter, Facebook and Instagram for more news and special offers.



SOCIAL MEDIA



THROUGHOUT THE FESTIVAL

CELEBRATING CORDELIA FINE



EXHIBITION
**OPENING TIMES MAY VARY, SEE LIBRARY WEBSITE FOR
INFORMATION | DROP-IN | ON UNTIL MON 30 APRIL
FREE | NATIONAL LIBRARY OF SCOTLAND | LEVEL 13**

Come along to the National Library of Scotland to see a display of items relating to Prof Cordelia Fine, recipient of the 2018 Edinburgh Medal in recognition of her scientific and literary work in the field of neuroscience, psychology and gender. Professor Fine is a psychologist and author, currently Professor of History and Philosophy of Science at the University of Melbourne, Australia. She is the author of numerous award-winning books including *Delusions of Gender* and *Testosterone Rex* which won the Royal Society's Science Book Prize in 2017.

Presented by the National Library of Scotland.

WILDLIFE PHOTOGRAPHER OF THE YEAR



EXHIBITION
**10AM-5PM | DROP-IN | £8/£6/UNDER 16S FREE
NATIONAL MUSEUM OF SCOTLAND | EXHIBITION
GALLERY 1, LEVEL 3**

Wildlife Photographer of the Year is the most prestigious photography event of its kind, attracting tens of thousands of entries from photographers worldwide. On loan from the Natural History Museum in London, this world-renowned touring exhibition features acclaimed photographs displayed on large-format, backlit panels, bringing you face-to-face with some of nature's most astonishing sights.

Presented by the National Museum of Scotland.
Image: Detail@Qing Lin.

COLLECTING SHADOWS: AN ARCHIVE OF MODERN LIFE



EXHIBITION
**11AM-6PM | DROP-IN | FRI 2 FEB-SUN 8 APRIL
FREE [NO BOOKING REQUIRED] | STILLS GALLERY**

In response to Stills' *Collected Shadows, The Archive of Modern Conflict* exhibition, we are inviting individuals to create a new photographic archive using modern technology. *Collecting Shadows* invites members of the public to take photographs on their mobile devices, recording shadows in their everyday lives. From the launch of the Science Festival, people can submit their images via Instagram, by tagging them #stillscollectingshadows until Saturday 7 April. Submissions will then be on display in the Stills Gallery window from 9-15 April.

Presented by Stills Gallery

BOOKING HOTLINE: 0844 557 2686

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK

SCIENCE FESTIVAL

Leaves



SPECIAL EVENT

AGES 18+

7.30PM | 3 HOURS | £12/£10 | CITY ART CENTRE

Our very first Science Festival took place in 1989 so, for our special 30th edition opening party, allow us to transport you back to the 80s for some excellent adventures and weird science galore in our flagship family venue. Shake it up at the *Blood Bar* like you're Tom Cruise in *Cocktail*, make your own version of *The Blob* in a *Splat-tastic* hands-on activity, and bring some patients back to life (back to reality?) in *ER Surgery*. There'll be bars, glow sticks, dirty dancing in the silent disco and not a Demogorgon in sight. Max up the hairspray, start practising your air guitar solo and get ready to party like it's 1989.



30

years

SYNTHETICA LAUNCH

SPECIAL EVENT



7PM-9PM | DROP-IN | FREE | SUMMERHALL

Join us for the launch of *Synthetica* at Summerhall for Science Festival 2018. Our latest contemporary art exhibition explores how our notions of the natural and the artificial may need to change in an era in which hybrid and synthetic life forms have come into existence.

As human beings, we have an incredibly strong sense of what we define as 'alive'. We grow plants in our garden and know that they are alive. We skim our fingers across the ridged surface of a wooden countertop and know that it is not alive. Yet, as scientists study the nature of living things, working on the frontier that separates living things from everything else, the lines become blurred.

Now more than ever, the definition of life is a vital question that holds implications for vast branches of synthetic biology, genetic engineering and ultimately the search for life elsewhere in the Universe. We live in an exciting time where life has become a raw material, for scientific and artistic purposes, and the possibilities for human health and human society are seemingly endless. But how do our culture, our society and even our language come to terms with these new ideas of life? Are we re-writing the working definitions of what is 'alive'?

Presented in association with Summerhall and ASCUS Art & Science



Scottish Government
Riaghaltas na h-Alba
gov.scot

Developed with support from Creative Scotland through the Scottish Government's Edinburgh Festivals Expo Fund

MASSAOKE: CLUB LA LA

SPECIAL EVENT



9PM | 4 HOURS | £8 ADVANCE, £6 STUDENTS, £10 ON THE DOOR | SUMMERHALL | DISSECTION ROOM

What is Massaoke? The idea is simple: a brilliant live band plays rock, pop and indie anthems with giant video lyrics, and the audience, singing as one, is the star of the show. They put on a spectacular, high-energy stage show, costumed in sequins and spandex, with a set list that ranges from the 70s to the present, from classic rock and pop to indie, disco, dance hits and retro favourites – with some science thrown in for this special edition.

Doors 9pm, 2 sets of live music between 10pm and midnight, DJ till close at 1am.

SATURDAY 31 MARCH...

SYNTHETICA

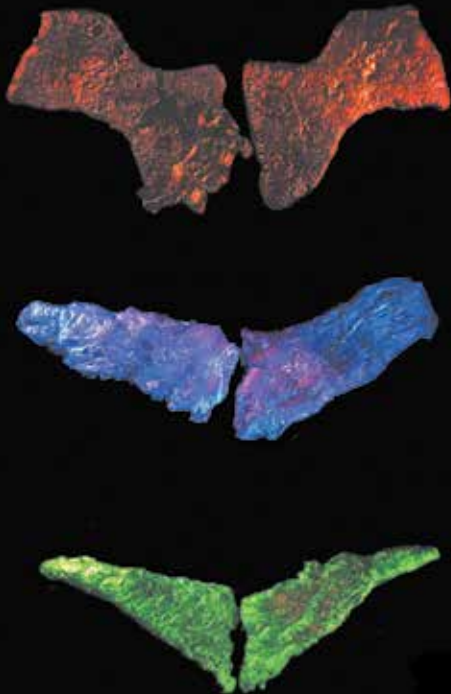
EXHIBITION



11AM-6PM | DROP-IN | ON UNTIL 13 MAY | FREE
SUMMERHALL

Synthetica, a special contemporary art exhibition co-curated by Edinburgh International Science Festival, Summerhall and ASCUS Art & Science, will showcase the work of established international artists working in the field of bioart, including renowned artists **Marta de Menezes**, **Oron Catts**, **Ionat Zurr**, **Tarsh Bates** and **Ting-Tong Chang**. Through works derived using the tools, techniques and often living tissues of scientific research, *Synthetica* will explore how our notions of the natural and the artificial may need to change in an era in which hybrid and synthetic life forms have come into existence.

Photo by Giulietta Verdon-Roe



Peng's Journey to the Southern Darkness (2016) [top]

Ting-Tong Chang

Pig Wings (2000) [above], *Odd Neoflism* (2010) [right]

Oron Catts and **Ionat Zurr**, The Tissue Culture & Art Project, hosted at SymbioticA, The University of Western Australia

Immortality for two (2012-2013) [lower right]

Marta de Menezes and **Luís Graça**, UNICEL Group, Instituto de Medicina Molecular

TING-TONG CHANG SCIENNES GALLERIES

Using robotic devices to simulate living animals, *P'eng's Journey to the Southern Darkness* brings lifelike characteristics to lifeless animal bodies. The sophisticated mechanism of each automaton contain within them a notion that life can be simulated by art and science. By blurring the line between the animate and the inanimate, these inventions embody a philosophical question to our perception of what makes a living being. This question posed by automatons is still a recurrent theme in science fiction; what we think of the future is in fact deeply rooted in the past.

MARTA DE MENEZES

MEADOWS GALLERIES

A selection of works forms a brief retrospective on the incredible career of **Marta de Menezes**. The concept of identity and a dichotomy between the natural and the artificial are recurrent themes in **Marta de Menezes'** practice. Beginning with *Immortality for Two*, the first collaborative work with her partner **Luis Graça**, which explores the reciprocal immortalisation of cells from two people in love, through to *The Origin of Species*, using CRISPR-Cas9 gene-editing technology to alter living organisms that are the product of selective breeding and domestication, and ending with her latest work *Truly Natural*, that will confront you with a live genetically altered organism.

ORON CATTS AND IONAT ZURR

WAR MEMORIAL LIBRARY

Well-known biological artists **Oron Catts** and **Ionat Zurr** (The Tissue Culture & Art Project) present their landmark work *Pig Wings* (2000). Advances in tissue engineering, xenotransplantation and genomics promise to render the living body as a malleable mass. Questioning the effect of these powerful technologies on the body and society, *Pig Wings* presents the first ever wing shaped objects grown using living pig tissue.

Pig Wings was developed at the Tissue Engineering and Organ Fabrication Laboratory, Harvard Medical School and SymbioticA Laboratory at the University of Western Australia.

ORON CATTS, IONAT ZURR AND

TARSH BATES WAR MEMORIAL LIBRARY

Following a residency at the UK Centre for Mammalian Synthetic Biology at the University of Edinburgh, Oron and Ionat, joined by **Tarsh Bates** will present a work in progress exhibition, *Crossing Kingdoms*, poetically exploring the products of cross-kingdom cell fusion in synthetic biology. The work raises questions, through actual manipulation of life forms, about the practical and ontological nature and identity of novel organisms that fall outside scientific and cultural classification systems. In what ways do multi-kingdom cell fusions challenge our categories and understandings of life? How can they be taxonomised? What are the impacts on the environment and society? *Crossing Kingdoms* reflectively dwell into traversing tangible and conceptual borders of life and living systems.

In collaboration with the Cachat Lab (UK Centre for Mammalian Synthetic Biology, University of Edinburgh) and the Jamie Davies Lab (Deanery of Biomedical Sciences, University of Edinburgh).

Supported by the Research Collaboration Award from The University of Western Australia.

SYNTHETICA ARTIST TALKS TING-TONG CHANG

SPECIAL EVENT



1PM | 1 HOUR | £5 | SUMMERHALL | ANATOMY

LECTURE THEATRE

Ting-Tong Chang's satirical gaze leaves no aspect of society untouched. Revelling in the absurd and illogical, he makes a mockery of socio-political subjects ranging from the social and ecological effects of consumerism to the functioning of the art world itself. Working across the distinct practices of ink drawing, durational performance and kinetic sculpture, his transgressive practice co-opts science, technology and history to dissect the world around him. Hear Ting-Tong discuss his work *P'eng's Journey to the Southern Darkness* as part of contemporary art exhibition *Synthetica*, in conversation with co-curator **Dr Sarah Thomas**, Edinburgh International Science Festival.

ORON CATTS

SPECIAL EVENT



2.30PM | 1 HOUR | £5 | SUMMERHALL | ANATOMY

LECTURE THEATRE

Oron Catts is the director of SymbioticA, an artistic research laboratory at The University of Western Australia. His interest is life; more specifically the shifting relations and perceptions of life in the light of new knowledge and its applications. Discussing his new work in progress in collaboration with artist **Dr Ionat Zurr**, *Crossing Kingdoms*, Oron will reflect on his recent residency at The University of Edinburgh as part of a research project on cross-kingdom cell fusion. Together with co-curator **Dr Sarah Thomas**, Edinburgh International Science Festival, we will cross the borders of life, both tangible and conceptual.

MARTA DE MENEZES

SPECIAL EVENT



4PM | 1 HOUR | £5 | SUMMERHALL | ANATOMY

LECTURE THEATRE

Based in Lisbon, **Marta de Menezes** is celebrated for her work at the intersection of art and biology, demonstrating the use of cutting-edge biological technologies as a new art medium. Speaking following the launch of contemporary art exhibition *Synthetica*, which presents a retrospective of her acclaimed works including *Immortality for Two* and *The Origin of Species*, **Marta de Menezes** will discuss the idea of what we consider 'natural' today and how the questions of our own identity can be explored in this work. Hosted by co-curator **Dr Sarah Thomas**, Edinburgh International Science Festival.

BOOKING HOTLINE: 0844 557 2686

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK

BOOKING HOTLINE: 0844 557 2686

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK

ECO₂VILLE



EXHIBITION

10AM-5PM | DROP-IN | ON UNTIL SUN 15 APRIL | FREE | THE MOUND PRECINCT

Join us on the Mound to take a stroll through our family-friendly low carbon village, an interactive installation that will inspire visitors of all ages to take steps towards an eco-friendly future. The advent of the low carbon age requires us to rethink the ways we travel, eat, drink and power our homes, placing greater emphasis on

recycling, reducing waste and conserving water and all our natural resources. This eye-catching exhibition will explore creative approaches to everyday issues and showcase technological solutions that will help us enter a new, low carbon age and embrace a sustainable way of living.

Headline sponsor



Supported by



THE HEART INSIDE AND OUT



WORKSHOP

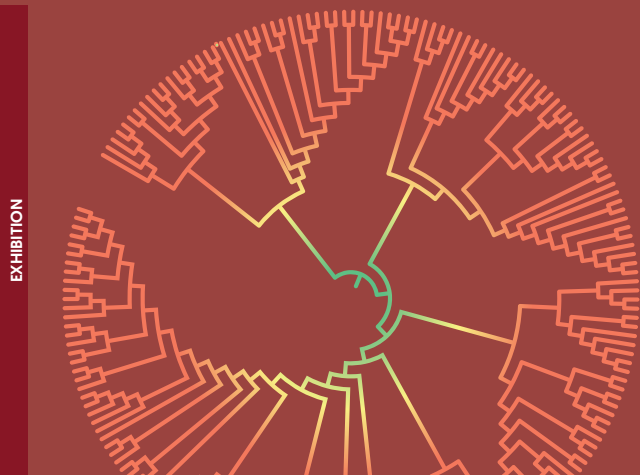
2PM AND 6PM | 3 HOURS | £15 | ASCUS LAB SUMMERHALL

So much of scientific imaging in heart research is reliant on the manipulation of animal tissue samples. This is in order to observe the biological structures to understand how they work and why they are important for maintaining health. Come along to this workshop to try some of these techniques and processes for yourself and look at your own heart in a whole new way.

Anyone under 18 must be accompanied by a guardian and they must also purchase a ticket.

Presented by ASCUS Art & Science

EXISTENCE: LIFE AND BEYOND



EXHIBITION

10AM-5PM | DROP-IN | ON UNTIL 15 APRIL | FREE | NATIONAL MUSEUM OF SCOTLAND | GRAND GALLERY

A celebration of life in all its forms, this interactive exhibition will guide you on a fascinating journey to the outer reaches of life as we know it, from the origins of life on Earth, to the horizons of what life could be in the future. This is the story of how life came to be and of humanity's role in nurturing, protecting and even enhancing it.

Existence: Life and Beyond will feature *Event Horizon*, by renowned artist **Jason Hackenwerth** – a colossal sculpture descending from above the National Museum of Scotland's Grand Gallery. Installed over several days by Jason and his team, you'll have the chance to watch the process first-hand as thousands of balloons are woven together to build this intricate structure before its grand unveiling on 6 April.



Event Horizon will be available to view until 22 April. You'll also find two immersive zones of hands-on interactives showcasing real research taking place in Scotland and around the world and two specially-commissioned digital installations from local artists. With assistance from the Science Festival's Youth Consultation Group.

Developed with support from Creative Scotland through the Scottish Government's Edinburgh Festivals Expo Fund



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SUPPORTED BY
year of young people
bliadhna na h-òigridh
2018

TIMESCAPES: TIMELAPSE MASTERCLASS WITH FILMMAKER WALID SALHAB



FILM

2.30PM | 2 HOURS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

What happens when we observe time? Scientists and filmmakers use cameras to bend and shift time to make observations and learn about the world we live in. In the first of two *TimeScapes* events exploring how we can experience time differently through the moving image, award-winning timelapse pioneer **Walid Salhab** – creator of the spectacular 'hyperlapse' film of the famous Kelpies statues – screens a selection of his films and explains the innovative techniques he uses to shoot them. Pick up some tips on making your own timelapse films and share them via the *TimeScapes* website at timescapesfilm.com.

Presented by MSc Film, Exhibition & Curation at The University of Edinburgh

ARE FRIENDS ELECTRIC? OUR FUTURE LIVES WITH ROBOTS



DISCUSSION

3PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

From books and TV to movies and games, our lives are full of images of our possible future lives with robots – some appealing, some nightmarish, some simply weird. What might future robots be like and might we want to be friends with them? Why are we so fascinated with robots anyway, and what does this tell us about ourselves? Join **Prof Tony Prescott**, psychologist, neuroscientist, and director of Sheffield Robotics, to explore how far we've come in creating the robots of our science fiction dreams, where we might get to in the future, and whether all of this is really such a good idea. This event is dedicated to Prof Sidney Michaelson (1925–1991), a champion of computer science.

Presented by the BCS, The Chartered Institute for IT

INTELLIGENT ANIMALS



DISCUSSION

5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | MAIN HALL

In *The Hitchhiker's Guide to the Galaxy*, Douglas Adams wrote: 'For instance, on the planet Earth, man had always assumed that he was more intelligent than dolphins because he had achieved so much.' Why do we consider some animals more intelligent than others? **Dr Jill MacKay** (author of upcoming book *Animal Personality*) and the panel will discuss what intelligence in animals means for scientists and the research they carry out, with a little advice on how to test the intelligence of your animals. Dogs welcome!

TIMESCAPES: NÉNETTE AND OUR PERCEPTIONS OF TIME



FILM

7PM | 2 HOURS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

Time is a personal experience. We talk about it as a changing phenomenon – 'time rushed by' – but we perceive time is passing at exactly the same pace for everyone. *Nénette* (2010) is the rarely-seen award-winning observational feature documentary by *Être et Avoir* director Nicolas Philibert about a 40-year-old female orangutan living in the Jardin des Plantes Zoo in Paris. This intimate portrait of an animal in captivity challenges our perceptions of time, splitting our attention between the intense focus on Nénette and overheard conversations of visitors reflected in the glass. Followed by a panel discussion with specialists in the fields of filmmaking, anthropology and zoology. In French, with English subtitles, certificate PG.

Presented by MSc Film, Exhibition & Curation at The University of Edinburgh

UNIVERSILLY CHALLENGED WITH JONNY BERLINER AND SIMON WATT



SPECIAL EVENT

8PM | 2 HOURS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

Are you ready to get quizzical and a little pedantic? Join science troubadour **Jonny Berliner** and *Ugly Animal* wrangler **Simon Watt** for this madcap twist on the pub quiz where points mean the tapered end of objects, and prizes promise to enhance your nerd credentials. Be warned, each and every round will be a little bit weird.

GET 'CHA HEAD IN THE GAME: TACKLING SPORTS CONCUSSION



DISCUSSION

8PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | MAIN HALL

In the past decade, concussion has become the major issue facing contact sport. Recognition that a degenerative brain disease, previously thought exclusive to boxers, was also affecting athletes from other sports has led to increasing concern about brain injuries. Learn about Scotland's leading efforts in sport, medicine and science from an expert panel, including **Dr William Stewart**; BBC Scotland's chief sports writer, **Tom English**; neuropsychiatrist **Dr Alan Carson**; **Nuala Deans** of the British Paralympic Association; former Scotland international rugby player **Dr Geoff Cross** and the concussion campaigner **Peter Robinson**.

Presented by University of Glasgow

ALSO ON TODAY

ONGOING EXHIBITIONS

10AM–5PM | CELEBRATING CORDELIA FINE | P.33

10AM–5PM | WILDLIFE PHOTOGRAPHER OF THE YEAR | P.33

10AM–5PM | ECOVILLE | P.36

10AM–5PM | EXISTENCE: LIFE AND BEYOND | P.36

11AM–6PM | COLLECTING SHADOWS | P.33

11AM–6PM | SYNTHETICA | P.35

MEGAGAME: WATCH THE SKIES



ACTIVITY

10AM | 6 HOURS | £30 | SUMMERHALL | MAIN HALL

Tired of the limited scope of modern video games and looking to play something with a bit more heft? Join this large-scale full-day social experiment in which we will enthusiastically role-play the end of the world. This six-hour megagame, led by original creator **Jim Wallman**, is played in teams, with each team representing a country and team members acting as President, Foreign Minister, Chief of Defense and Chief Scientist. There will be diplomacy, intrigue, war and aliens, and a loose set of rules to encourage blue-sky thinking.

Presented by Stone Paper Scissors

THE MIRROR TRAP



ACTIVITY

11AM–6PM | DROP-IN | ON UNTIL SAT 14 APRIL | FREE

SUMMERHALL

A short headphone horror story about psychology and quantum physics. Paul Gato locked himself in his room. When police finally battered down the door, they found a gun, two mirrors, a vial of LSD and a diary full of ramblings and Feynman diagrams, but Paul had disappeared. In his diary, Gato wrote that the most dangerous thing in the world was to be 'trapped between mirrors'. Gato had lost his mind but perhaps found something else. Dare you re-enact his final experiment?

WELLBEING CAFÉ



SPECIAL EVENT

11AM–6PM | DROP-IN | FREE

SUMMERHALL | DISSECTION ROOM

Drop in and explore how we can talk about mental health issues without the stigma and foster positive wellbeing. Chat over a cup of tea, or join in with some of our pop-up activities including a creative drawing corner, group singing session with **HarmonyChoir**, creative writing workshop led by *Marbles Magazine* editor **Kirstyn Smith**, spoken word performances, an hour of endorphin-releasing freestyle dancing and more. *All activities are free but some may require sign-up in advance, please see sciencefestival.co.uk for specific timings and details.*

In association with Health in Mind

CAPTURING THE CHROMOSOME



WORKSHOP

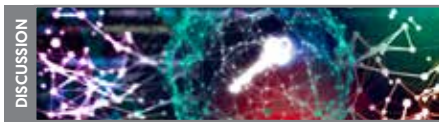
2PM AND 6PM | 90 MINS | £15 | SUMMERHALL

ASCUS LAB

Come along to ASCUS Lab to explore and draw cell biology through the microscope. Meet cell biologist **Bill Earnshaw**, who is doing cutting-edge research into how the human genome is structured and what happens when it divides. Don't miss this unique opportunity to observe and draw parts of the process of cell division and learn more about what makes us human on a cellular level. *Anyone under 18 must be accompanied by a guardian and they must also purchase a ticket.*

Presented by Ascus Art & Science

IS IT GAME OVER FOR CODEBREAKERS?



DISCUSSION

3PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

Mark Fray, author of *DeCipher: The Greatest Codes Ever Invented and How to Break Them*, looks at what it means for a code or cipher to be impossible to crack and whether there is a future for secret services such as GCHQ. He'll explore codes that have remained uncracked, despite generations of professional and amateur codebreakers' attempts, and consider the rise of the machine in cryptography, as well as the dawn of the computer age. Bringing the topic right up to date, Mark will examine the promise of quantum cryptography and Edward Snowden's revelations on just what the spooks are up to.

THE PSYCHOLOGY OF BRIBERY



DISCUSSION

5:30PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | MAIN HALL

When do financial incentives work and why can they sometimes backfire? The author of *Mind over Money* and presenter of Radio 4's *All in the Mind*, **Claudia Hammond**, delves into the science of bribery. If you're paid for a task does it rob you of the pleasure? From £1 million bonuses to bribing children to learn their times tables, Claudia examines the latest psychological research to reveal when we should and shouldn't attempt to use money to get someone to do what we want them to.

THE SEDUCTION OF CURVES



DISCUSSION

5:30PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

Curves are seductive. These smooth, organic lines and surfaces – like those of the human body – appeal to us in an instinctive, visceral way that straight lines or the perfect shapes of classical geometry never could. **Allan McRobie**, of the University of Cambridge, takes us on an alluring exploration of the beautiful curves that shape our world – from our bodies to Salvador Dalí's paintings and the space-time fabric of the universe itself.

Presented by Princeton University Press

ALEXANDRA LAUDO – RESEARCHER IN RESIDENCE AT COLLECTIVE



DISCUSSION

5:30PM | 90 MINS | FREE (BOOKING REQUIRED)

MUSEUM OF EDINBURGH

Alexandra Laudo is a Barcelona-based curator with a particular interest in time. She will take up the temporary position of Festival Researcher in Residence at Collective, the new home for contemporary art on Calton Hill opening spring 2018. Her lecture will draw on her research into the social construction of time and its measurement, the history of clocks, the implementation of clock time and the rich story of timekeeping on Calton Hill.

Presented by Collective

MIRACLE BREW



DISCUSSION

8PM | 90 MINS | £12/£10 | SUMMERHALL

DISSECTION ROOM

Take your seat at the bar with beer writer **Pete Brown** for a flight of beers that will tell the incredible story of the most popular alcoholic drink in the world. You'll discover the amazing flavours created by beer's key ingredients – hops, barley, yeast and water – and explore the history, nature and science of the drink that helped give birth to civilisation.

Beer by BrewDog

THE METAMORPHOSIS: AFTER KAFKA AND NABOKOV



SHOW

8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | ANATOMY LECTURE THEATRE

'*Gregor Samsa awoke from unquiet dreams to find that in his sleep he had turned into a vile and verminous insect.*' A new interpretation of Kafka's work starring a live beetle. *The Metamorphosis* is one of the most famous short stories in the world. In a former life, novelist Vladimir Nabokov was an entomologist. He criticised many translations of Kafka's work for inaccuracies in their details regarding the beetle that Gregor Samsa becomes. This new theatrical interpretation incorporates Nabokov's thoughts and puts Gregor – the man and the insect – side by side.

MONDAY 2 APRIL

ALSO ON TODAY

ONGOING EXHIBITIONS

10AM–5PM | CELEBRATING CORDELIA FINE | P.33

10AM–5PM | WILDLIFE PHOTOGRAPHER OF THE YEAR | P.33

10AM–5PM | ECOVILLE | P.36

10AM–5PM | EXISTENCE: LIFE AND BEYOND | P.36

11AM–6PM | COLLECTING SHADOWS | P.33

11AM–6PM | SYNTHETICA | P.35

DRAWING ON THE BEAUTY OF BIRDS

AGES 16+

WORKSHOP



1PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

Birds have been a much-loved subject of art for centuries. Join artist **Jaya Ogilvie** along with a bird expert to discover more about the crucial role birds play in ecosystems around the world and find out how to capture their incredible beauty in your own artistic creations. All art materials included.

BUILD A STEAMPUNK ROVER

WORKSHOP



5.30PM | 90 MINS | £12/£10/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

Venus is one of our neighbours but its harsh environment makes it almost impossible to explore. The missions to the surface have been short and brutal. If modern machines struggle with the atmosphere then maybe we have to go backwards to go forwards. New mission plans are looking at creating mechanical machines, not powered by engines, which can survive on the surface, based on old designs. Discover more about these new designs while getting to build your own walking rover to take home.

THE CULTURE CLUB

DISCUSSION



5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | MAIN HALL

Play test subject for psychologist **Prof Christine Caldwell** and her team from the University of Stirling as you learn about the evolution of culture and what makes human culture different from social learning in other animals. In humans, the accumulation of cultural knowledge accounts for the development of powerful tools and technologies. Do we see anything like this in other species, and what is necessary to support the transmission of such complex behaviours? Experience some of the research methods used to investigate cultural transmission in human participants to discover more about how people pass on knowledge to others.

SKEPTICS AT THE SCIENCE FESTIVAL

AGES 18+

DISCUSSION



7.45PM | 90 MINS | ALSO ON TUE 3–THU 5 AND MON 9–THU 12 APRIL | FREE (DONATIONS WELCOME)

(NO BOOKING REQUIRED) | BANSHEE LABYRINTH

Returning for another year, the Edinburgh Skeptics will delve into the world of strange and unexpected science with some very different speakers providing a skeptical insight into some surprising and wide-ranging topics. For full programme of events, visit edinburghskeptics.co.uk.

Presented by Edinburgh Skeptics

EVOLUTION OF MONEY

SPECIAL EVENT



8PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

Money is a collective human invention. Many of us spend more waking hours at work, preparing for work, complaining about work, and commuting to and from work than enjoying our families and friends, all for the purpose of making money. However, our currencies – especially digital currencies – are changing, and the things that we assign value to are changing too. How much is your time worth? What about your data? Join BBC Radio 4 presenter **Claudia Hammond**, **Susanna Hastilow** of the Museum on the Mound and **Dr Bettina Nissen** as we explore the evolution of money.

THE LAB OF THE LUDICROUS

SPECIAL EVENT



8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | MAIN HALL

Part stand-up comedy, part journal club, and part science project, **Dr Robert Pyatt** will lead you through some of the strangest science studies ever conducted, like *Skipping and Hopping in Undergraduate (Students): Recollections of When and Why*, *Transplanting Beavers by Airplane and Parachute*, *Testing the Danish Myth that Alcohol can be Absorbed Through the Feet*, and *Bust Size and Hitchhiking: A Field Study*. Get involved as we try to independently replicate the results from another improbable science study, but you'll have to come to the event to see what we're studying or we'll bias our results!

SPACEFLIGHT ON A SHOESTRING

DISCUSSION



8PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | ANATOMY LECTURE THEATRE

Scotland is currently bidding to create a new spaceport which will be capable of launching newly created vehicles into space. That holiday to see Earth from above might be getting closer, but the trip will be incredibly expensive. However, as more opportunities arise and competition starts to drive costs down, what is the future for space transportation? Join science presenter **Neil Monteiro** and experts from the Scottish space industry to discover how and why space travel will get cheaper and how soon you might really be able to take a trip to space.

BEHIND THE BROWSER

DISCUSSION



8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

We all love and depend on the internet, but what's actually happening to make it work? All the way from mouse click to page refresh we will explore what's going on behind the browser. We will also explore our data security. How safe is WiFi? Should you save credit card details? What are cookies all about? What to do about all those passwords? **Ken McBain** of global technology company Viavi Solutions will answer these questions and more.

ALSO ON TODAY

ONGOING EXHIBITIONS

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10AM–5PM | WILDLIFE PHOTOGRAPHER OF THE YEAR | P. 33

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10AM–5PM | EXISTENCE: LIFE AND BEYOND | P. 36

11AM–6PM | COLLECTING SHADOWS | P. 33

11AM–6PM | SYNTHETICA | P. 35

RECURRING EVENTS

7.45PM | SKEPTICS AT THE SCIENCE FESTIVAL | P. 39

A VERY SHORT INTRODUCTION TO... MATERIALS

AGES 14+
DISCUSSION1PM | 1 HOUR | £6/#SCIFIVE £5 | SUMMERHALL
ANATOMY LECTURE THEATRE

The study of materials is a major field of research that supports and drives innovation in technology. Using modern scientific techniques, materials scientists and engineers explore and manipulate materials, and create new ones with remarkable strength and extraordinary optical and electrical properties. In this *Very Short Introduction*, **Emeritus Professor Christopher Hall** from The University of Edinburgh looks at a wide range of materials – from steel, wood, and rubber; to gold, silicone and graphene – describing how they are used, how their properties arise from their internal structure, and the useful and novel things that are made from them.

Presented by Oxford University Press

LOW POWER. HIGH VOLUME. SERIOUS IMPACT



DISCUSSION

5.30PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

Prof David Flynn, a Fellow at Arm Ltd, will reflect on the challenges of energy-efficient design, its implementation and the use of modern computer chips. He will discuss the partnerships which support applications from sensors to servers and the role technology has to play in connecting communities and addressing sustainable global development goals.

Supported by the James Clerk Maxwell Foundation

UNEARTHING THE SECRETS OF CORPSES

AGES 18+
SPECIAL EVENT

5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

We are born, we live and then we die. But then what? It's the start of a fascinating, eventful, if a bit gory and smelly, journey that happens as your body decomposes. However there is much about human composition that we don't know. Delving into the secrets of human corpses, paranormal investigator **Innes Smith** is joined by forensic anthropologist **Dr Anna Williams**, **Dr Christopher Rynn**, forensic artist and Human Remains Conservator **Cat Irving** of Surgeons' Hall Museums, who will demonstrate how tissue can be preserved.

Warning: the event will contain smells and images that some attendees may find unpleasant.

MAPPING THE FUTURE



DISCUSSION

5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | MAIN HALL

We all love maps and making journeys, but this experience has advanced significantly, thanks to smarter geospatial information. In this event, we'll reveal some of the developments being made by the industry. Our diverse panel includes President of the Royal Geographical Society, **Prof Iain Stewart**; CEO of Ordnance Survey, **Nigel Clifford**; **Prof Paul Longley** of the University College London; Chief Science Advisor at the National Farmers' Union, **Dr Helen Ferrier** and founder of geospatial company, CARTO, **Javier de la Torre**. They will canvas the audience for instant feedback on geography-related ideas and take a closer look at the social, ethical and privacy considerations that come with all these advances.

Presented by the Association for Geographic Information and the Royal Scottish Geographical Society. Supported by Ordnance Survey and CARTO

FROM BENCH TO BEDSIDE AND BEYOND



DISCUSSION

5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

It takes an average of 12 years for a drug to travel from the research lab bench to the patient's bedside. Edinburgh's BioQuarter is a leading campus for translational medical research, turning innovative ideas into reality and driving medical innovation in Scotland and beyond. Discussing how new medical treatments are progressed from 'bench to bedside' in the cutting-edge field of stem cell research, healthcare journalist **Pennie Taylor** is joined by Programme Director **Hans Möller**, University of Edinburgh neurologist **Prof Anna Williams**, University of Edinburgh stem cell researcher **Dr Tilo Kunath** and Cell Therapy Development Manager for RoslinCT, **Dr Lindsay Fraser**.

Supported by



NEW WEAPONS. NEW WOUNDS: MEDICINE IN WAR AND REBELLION



DISCUSSION

6.30PM | 1 HOUR | ALSO ON THU 5 AND THU 12 APRIL

£10/£7 | ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

Take a behind-the-scenes tour of the Royal College of Physicians of Edinburgh and discover how medicine has adapted over the centuries to cope with the increasingly sophisticated weaponry of warfare and the nature of resulting casualties. The College's fascinating collections of medical objects and books will show the many facets of medical practice in the history of war and rebellion, telling the stories from the front line of medicine.

Presented by the Royal College of Physicians of Edinburgh

WEDNESDAY 4 APRIL...

WHO LIVES AND WHO DRIVES?



DISCUSSION

8PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

We are rapidly approaching a time where self-driving cars will be an everyday reality, and intelligent robots will be making routine decisions about our healthcare treatments. But what happens when machines have to make a choice between human life or death? Join **Prof Lilian Edwards**, philosopher **Dr Mark Sprevak** and expert in human interactions with automated vehicles **Dr Tyron Louw** to discuss how, or if, it's possible to programme morality and reduce ethics to an algorithm, who decides which principles apply and who bears ultimate responsibility if things go wrong.

WHAT NEXT FOR THE ANIMALS OF PLANET EARTH?



DISCUSSION

8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | MAIN HALL

More than any animal in the history of planet Earth, humans are altering the planet immeasurably. Which animals will adapt to our presence? Join zoologist **Jules Howard** as three well-known evolutionary biologists pitch their survivors to the audience, giving details of their possible future evolution and the form they may one day take thanks to our relentless being. Panel includes world fly expert **Dr Erica McAlister**, zoology curator **Paolo Viscardi** and ape expert **Adriana Lowe**.

WHAT THE WORLD CAN TEACH US



DISCUSSION

8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

From mobile phones to hearing aids, microphones are very common yet their designs still have significant drawbacks. Could nature play a role in improving their quality and our lives? Join engineer **Dr Rob Malkin** for an award winning talk, as he explores biomimicry and shows how studying insects with fascinating hearing organs could hold the key to helping us build bio-inspired acoustic devices.

ALSO ON TODAY

ONGOING EXHIBITIONS

10AM-5PM | CELEBRATING CORDELIA FINE | P.33

10AM-5PM | WILDLIFE PHOTOGRAPHER OF THE YEAR | P.33

10AM-5PM | ECOVILLE | P.36

10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.36

11AM-6PM | COLLECTING SHADOWS | P.33

11AM-6PM | SYNTHETICA | P.35

RECURRING EVENTS

7.45PM | SKEPTICS AT THE SCIENCE FESTIVAL | P.39

A VERY SHORT INTRODUCTION TO... PERCEPTION



DISCUSSION

1PM | 1 HOUR | £6/#SCIFIVE £5 | SUMMERHALL

ANATOMY LECTURE THEATRE

Perception is one of the oldest and most deeply investigated topics in the field of psychology, and also raises some profound philosophical questions. It is concerned with how we use the information reaching our senses to guide and control our behaviour and to create our particular, subjective experiences of the surrounding world. Experimental psychologist **Prof Brian J Rogers** analyses the psychological and philosophical aspects of perception, and argues that what we see is not what we perceive. He investigates recent insights gained from the use of imaging techniques, and the attempts to model perceptual processes in AI systems.

Presented by Oxford University Press

SEARCHING FOR DARK MATTER AND DARK ENERGY



DISCUSSION

5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

Join philosopher of science, **Prof Michela Massimi**; cosmologists **Prof Ofer Lahav** and **Prof John Peacock**; astrophysicists **Prof Kathy Romer** and **Prof Alex Murphy** to learn about dark matter and dark energy, and hear the latest evidence suggesting they make up most of the cosmos. Discover the methods, and experimental techniques used at the Dark Energy Survey, and pressing philosophical questions surrounding them. The event is chaired by BBC radio broadcaster **Dr Shahidha Bari**.

Presented by the European Research Council.

Image: Reidar Hahn, Fermilab

MAKING THE MONSTER



DISCUSSION

5.30PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

Explore the science behind Mary Shelley's *Frankenstein*... Is there any science fact behind the science fiction? And how might a real-life Victor Frankenstein have gone about creating his monster? The century before its publication saw huge advances in our understanding of science, particularly electricity and physiology. Sensational science demonstrations caught the imagination of the general public, and newspapers were full of lurid tales of murderers and resurrectionists. From stories of artificial life and experimental surgery, to 'monsters' and electrical experiments on human cadavers, **Dr Kathryn Harkup** examines the science and scientists that influenced Shelley and inspired her most famous creation.

THIS TIME, IT'S PERSONAL: THE FUTURE OF HEART DISEASE DIAGNOSIS



DISCUSSION

5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | MAIN HALL

Join British Heart Foundation Scotland for a panel discussion about the future diagnosis and treatment of heart disease. You'll discover how a more precise test developed in Edinburgh could identify those most at risk of a heart attack and how measuring levels of the protein troponin in our blood could indicate heart health. You'll also hear **Gavin McMurray's** story of the devastation of losing a lifelong friend to a heart attack, then surviving a heart attack himself years later, experiences which inspired him to raise money for BHF Scotland while achieving lifelong sporting ambitions.

Presented by British Heart Foundation Scotland

SOUND ART



AGES 16+ WORKSHOP

5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | ANATOMY LECTURE THEATRE

Lose yourself inside the aural landscape of drawing, where the sound of mark-making becomes an instrument in The Reverse Engineer's orchestra. Using the magic of live sampling and electronic manipulation, **Topaz Pauls** and **Dave House** will create a rich soundscape using your pencil's rhythmic hatching, your charcoal's sensual swooping, your paper's gentle rustling, and the model's heartbeat and breath. An experiment in immersive life drawing, not to be missed.

FRIEND OR FOE? THE PARASITES THAT LIVE INSIDE US



5.30PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

Explore our relationships with the many parasites that live inside us. You'll find out why some parasites are so deadly and how the latest research is trying to prevent and control them. You'll meet arguably the world's most successful parasite – *Toxoplasma gondii* – which can infect all warm-blooded animals and lives in the brains of 1 in 5 people in Scotland. You'll also discover ways in which parasites – in the form of worm therapies – could be the answer to controlling our immune responses to prevent allergic diseases such as asthma and inflammatory bowel disease.

Presented by The Royal Society of Edinburgh and Young Academy of Scotland

LOST AND FOUND



8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

Neurologist, **Dr Jules Montague**, explores what remains of the person left behind when the pieces of their mind go missing. Why do some memories endure and others fade? Why do you sometimes forget why you went into a room? And what if rather than losing memories, your mind creates false ones – are they still yours, and do they still make you, you? In her new book, *Lost and Found*, Dr Montague looks at how we lose ourselves and those around us – and how we can be found again.

Presented by Hodder & Stoughton Ltd

CHEESEOLOGY 3.0



8PM | 90 MINS | £15 (INCLUDES CHEESE SAMPLES)

SUMMERHALL | DISSECTION ROOM

Returning to the festival for a third year, following last year's sellout show, dairy technologist **Paul Thomas** and self confessed curd nerd **Patrick McGuigan** explore the science behind the flavour and texture development in cheese during manufacture and ripening. The complex science involved in the process will be explained in layman's terms and will be accompanied by a tasting of cheeses which demonstrate the effect that the milk, the recipe and the skill of the cheesemaker can have to influence the final product.

SHOULD WE 'EDIT OUT' DISABILITY?



8PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | MAIN HALL

Scientific breakthroughs like genome editing tool CRISPR may lead to the potential to 'edit out' hereditary disabilities as well as diseases. Is this a choice we should make? A world without disability could mean fewer people live with pain and discomfort, but it could also curb social diversity and lessen the capacity to engage with others with different experiences. Some people see their disability as part of their identity and wouldn't change it, while others would welcome the idea. Join our panel including leading disability studies researcher and theorist **Dr Fiona Kumari Campbell**, campaigner in deaf/disability issues **Tomato Lichy**, and science policy and bioethics expert **Dr Sarah Chan** to discuss who should decide this complex question, and how close the science is to making these decisions a reality.

DIGITAL GRIEF



8PM | 75 MINS | £8.50/£6.50/#SCIFIVE £5 | SUMMERHALL

RED LECTURE THEATRE

Our lives are increasingly lived online and when we die, we leave behind emails, social media accounts and a world of other data for those closest to us to deal with. Now, digital technologies are also influencing our grieving processes; social media share both personal and collective mourning online, chatbots act as grief counsellors and more and more people are faced with the challenge of managing the digital legacies of their loved ones. **Dr Korina Gioxoglou**, who researches the sharing of mourning on social media, will be joined by social scientist and mental health expert **Dr Jo Bell** to explore how we grieve in the digital age.

EDINBURGH MEDAL ADDRESS: SCIENCE, VALUES AND GENDER EQUALITY



7PM | 1 HOUR | £12/£10 | CITY CHAMBERS | MAIN CHAMBER

The Edinburgh Medal is a prestigious award given each year to men and women of science and technology who are judged to have made a significant contribution to the understanding and wellbeing of humanity.

The 2018 Edinburgh Medal is awarded to **Prof Cordelia Fine**, author and Professor of History and Philosophy of Science at the University of Melbourne, for her work on the understanding of gender stereotypes, challenging gender perceptions and for her contributions to public discourse to close the gender gap.

Join Cordelia for this year's Edinburgh Medal Address as she discusses science, values and gender equality. Scientific claims and beliefs have long shaped our views about why gender inequalities exist and have been used as ammunition in disagreements about the desirability and feasibility of change. This talk will explore the role of science, and values, in our contemporary debates. Oration by **Prof Sophie Scott**, Professor of Cognitive Neuroscience at University College London. Vote of thanks by **Prof Lynn Abrams**, Head of School of Humanities, the University of Glasgow.

Image: Paul Burston (University of Melbourne)

PREVIOUS EDINBURGH MEDAL RECIPIENTS

2017 Prof Peter Piot
2016 Kevin Govender and the IAU
2015 Mary Midgley
2014 Prof Mary Abukutsa-Onyango
2013 Prof Peter Higgs and CERN
2012 Dr James Hansen
2011 Prof Carl Djerassi
2010 Sir Alex Jefferies
2009 Prof Jonathan Beckwith
2008 Prof Chris Rapley
2007 Dr Richard Horton
2006 Prof James Lovelock
2005 Prof Colin Blakemore
2004 Prof Steven Rose

2003 Prof Wang Sung
2002 Dr Lise Kingo
2001 Sir John Sulston
2000 Prof Lynn Margulis
1999 Prof Jocelyn Bell Burnell
1998 Sir David Attenborough
1997 Prof Amartya Sen
1996 Prof Richard Levins
1995 Sir John Crofton
1994 Prof Manuel Patarroya
1993 Prof Wangari Maathai
1992 Prof Heinz Wolff
1991 Prof Jane Goodall
1990 Prof Stephen J Gould
1989 Prof Abdus Salam

THURSDAY 5 APRIL...

PARTNER WITH US

At Edinburgh International Science Festival, Scotland's largest science education charity, we have a vision of a world where science and technology is recognised and celebrated as central to our lives, and where organisations work together to create a bright and sustainable future.

Our annual Science Festival attracts an audience of 150,000 people, delivering more than 250 events across 30 venues around Edinburgh. When we are not delivering the Festival, we're taking science to over 60,000 primary school children with Generation Science, and promoting exciting and rewarding careers in science, technology, engineering and maths (STEM), through Careers Hive. Through the generous support of our partners, we inspire, inform and entertain the next generation of problem solvers and support the young minds that will shape the future.

You can help us continue and improve on our work and ensure that our events and programmes remain accessible to all.

We offer a variety of packages that can be tailored specifically to develop and deliver a bespoke partnership that works for you and your organisation. Whether it is through a one-off donation or long-term sponsorship, we will work closely with you to ensure the needs of you and your organisation are met.

Together, we can enthuse tomorrow's innovators and create new opportunities for the next generation.

Contact David, our Development Manager, to discuss the available opportunities:
david@scifest.co.uk

Registered Charity no. SC003790



ALSO ON TODAY

ONGOING EXHIBITIONS

10AM–5PM | CELEBRATING CORDELIA FINE | P.33

10AM–5PM | WILDLIFE PHOTOGRAPHER OF THE YEAR | P.33

10AM–5PM | ECOVILLE | P.36

10AM–5PM | EXISTENCE: LIFE AND BEYOND | P.36

11AM–6PM | COLLECTING SHADOWS | P.33

11AM–6PM | SYNTHETICA | P.35

RECURRING EVENTS

6.30PM | NEW WEAPONS, NEW WOUNDS | P.40

7.45PM | SKEPTICS AT THE SCIENCE FESTIVAL | P.39

A VERY SHORT INTRODUCTION TO... WATER



1PM | 1 HOUR | £6/#SCIFIVE £5 | SUMMERHALL

ANATOMY LECTURE THEATRE

Water dominates the surface of Earth and is vital to life on our planet. It is a remarkable liquid which shows anomalous behaviour. In this *Very Short Introduction*, **John Finney**, Emeritus Professor of Physics at University College London, introduces the science of water, and explores how the structure of water molecules gives rise to its physical and chemical properties.

Presented by Oxford University Press

DEEP TIME WALK



2PM AND 5.30PM | 2 HOURS

ALSO ON FRI 6 APRIL: 2PM AND 5.30PM,

SAT 7 APRIL: 10AM AND 2PM | £8.50/£6.50

HOLYROOD PARK | MEET AT THE PLEASANCE SPORTS COMPLEX, 46 PLEASANCE

Join a live performance of the Deep Time Walk – a 4.6km tour through Edinburgh's Holyrood Park, travelling across Earth's 4.6-billion-year geological timeline at a rate of 1 million years per metre. The walk starts at the accretion of the Earth and goes on to cover some of the significant events in Earth's history, including the formation of the moon, plate tectonics, the early evolution of life, The Great Oxidation, mass extinctions, dinosaurs and much more – including the arrival of modern humans during the last few centimetres.

Moderate fitness, outdoor clothing and sturdy footwear required. Discover the Deep Time Walk mobile app at deeptimewalk.org

Presented by Edinburgh Geological Society

THE AMAZING SCIENCE OF BAD LANGUAGE



5.30PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

Can swearing be beneficial to our health and wellbeing? **Dr Emma Byrne** is backing evidence that it is, in her new book *Swearing is Good for You*. This is a spirited and hilarious defence of our most cherished dirty words backed by cutting-edge research.

Presented by Profile Books

GET YOUR HANDS OFF ME YOU DAMNED DIRTY ALIEN!



5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | MAIN HALL

With manned missions to Mars coming soon, and the increasingly frequent discovery of planets orbiting other stars in their habitable zone, a human encounter with alien life seems inevitable. In this event hosted by philosopher **Dr Ben Sachs**, astrobiologist **Dr Sarah Rugheimer**, theologist **Prof David Wilkinson**, political theorist **Dr Alasdair Cochrane** and philosopher **Prof Mark Coeckelbergh** envisage our ethical world turned upside down by a future encounter with an advanced alien species.

Presented by University of St Andrews

PROOF OR LIES?



5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | ANATOMY LECTURE THEATRE

Every day juries are given the responsibility of deciding the fate of those accused in criminal trials and key evidence can be the difference between innocent or guilty. Some types of forensic evidence are perceived as more concrete in proof than others, but if jury members don't fully understand the limitations and interpretations of that evidence it can lead to putting the innocent behind bars, or to the guilty walking free. In a discussion chaired by High Court and Court of Session judge, **the Honourable Lady Scott**, **Dr Ben Jones** will take a closer look at fingerprint and forensic trace evidence, while **Dr Faye Skelton** will investigate the challenges of eye witness testimony and **Dr Alexander Gray** will decode DNA analysis.

BOOKING HOTLINE: 0844 557 2686

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK

THE HEALTHCARE
REVOLUTION

5.30PM | 75 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

CRISPR-Cas9 is a revolutionary genome editing tool that is creating a buzz in the science world. It is faster, cheaper and more accurate than previous DNA editing techniques and has a wide range of possible applications. But how close are we really to seeing its use in our everyday fight to stay healthy? Join a panel including **Dr Andrew Wood** from the University of Edinburgh's MRC Human Genetics Unit and **Prof Bruce Whitelaw** from the Rosin Institute to get the crib notes on CRISPR.

Supported by

Marks&Clerk
Intellectual Property Services

C4 RICE: THE AGRICULTURAL
APOLLO CHALLENGE6PM | 90 MINS | FREE (BOOKING REQUIRED) | ROYAL
BOTANIC GARDEN EDINBURGH | LECTURE THEATRE

The C4 Rice Project addresses one of the scientific grand challenges of the 21st century. Predicted population increases mean that the area of rice production that fed 27 people in 2010 will have to feed 43 people by 2050. By using technology to introduce C4 biochemical pathways that function in maize, photosynthesis in rice could be supercharged to increase production. **Prof Jane Langdale** will review current research and explore how this revolutionary project could increase yield with lower inputs and less water.

Presented by Royal Botanic Garden Edinburgh

BARNEY'S BEER
PRACTICAL MASH-IN

7PM | 1 HOUR | ALSO ON FRI 6 APRIL | £10

SUMMERHALL | SUMMERHALL BREWERY

Join Barney in his brewery for an abridged insight into the three principal processes of brewing: mashing, boiling and fermentation. During this fast-paced, practical demonstration you'll discover how water, barley and hops are transformed – with the help of brewer's yeast and the brewer himself – into the delicious elixir that is beer.

BILINGUALISM MATTERS



7PM | 90 MINS | £5 | RZSS EDINBURGH ZOO

EDUCATION CENTRE

Discover the benefits of bilingualism for the brain. Linguist **Prof Antonella Sorace** explores the positive effects of language learning on children's development and perception, and some of the challenges for bilingual families.

Presented by Bilingualism Matters, University of Edinburgh

A PANEL OF ICE AND FIRE



8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

You might think fantasy is the opposite of science, but comedian and author of *The Science of Game of Thrones* **Helen Keen** would disagree. Join Helen along with **Dr Rory Hadden**, Senior Lecturer in Fire Investigation at The University of Edinburgh and a variety of other exciting guests for an evening of ice, fire, fantasy and fun.

BEST BEFORE: THE
EVOLUTION AND FUTURE OF
PROCESSED FOOD

8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | ANATOMY LECTURE THEATRE

The ability to process food has undoubtedly made us one of the most successful species on the planet, but have we gone too far? The more obscure types of food processing, such as growing steaks in a test-tube and 3D-printed pizzas, seem to have come straight from the pages of a science-fiction novel. Why is it that we only tend to notice these changes when the latest scaremongering headline hits the news? **Nicola Temple** puts processed food into perspective and arms consumers with the information they need to make rational, informed decisions about their food.

Presented by Bloomsbury Publishing

TEACHERS
AND STUDENTS
£5 TICKETS!

#SCIFIVE



FIG 1. SCIPALS JOCELYN BELL BURNELL AND ISAAC NEWTON DEMONSTRATE A SUCCESSFUL #SCIFIVE!

Are you sci-curious? Students and teachers can explore *Life, the Universe and Everything* with tickets for just £5 at most Science Festival 2018 events – everything from engaging workshops and discussions to a great night out!

Look out for the #scifive tag as you browse event listings and follow us on Twitter, Facebook and Instagram for more news and special offers.

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FRIDAY 6 APRIL

ALSO ON TODAY

ONGOING EXHIBITIONS

10AM–5PM | CELEBRATING CORDELIA FINE | P.33

10AM–5PM | WILDLIFE PHOTOGRAPHER OF THE YEAR | P.33

10AM–5PM | ECOVILLE | P.36

10AM–5PM | EXISTENCE: LIFE AND BEYOND | P.36

11AM–6PM | COLLECTING SHADOWS | P.33

11AM–6PM | SYNTHETICA | P.35

RECURRING EVENTS

2 + 5.30PM | DEEP TIME WALK | P.43

7PM | BARNEY'S BEER PRACTICAL MASH IN | P.44

TRANSLATING TRAVELS



10AM–6PM | DROP-IN | ON UNTIL SAT 21 JULY (NOT SUNDAYS OR MONDAYS) | FREE

(NO BOOKING REQUIRED) | EDINBURGH PRINTMAKERS

Imi Maufe has been turning journeys into books since 2002. Each book is a concise, conceptual documentation of the events that happened along the way.

The Translating Travels is an exhibition showing work from the past fifteen years. The pieces, which capture the story of Imi's travels, are primarily contained box pieces sometimes involving collaboration with other artists. Maufe participates in the Norwegian tradition of ice bathing – which has inspired a series of SwimWalks, as part of the Blue Hat Swim Club, which was established at Hospitalfield, Arbroath. These swimming hats will form part of the exhibition and a SwimWalk will also take place during this time, in Edinburgh.

For more information, please visit edinburghprintmakers.co.uk

Presented by Edinburgh Printmakers. Image credit: Imi Maufe

A VERY SHORT INTRODUCTION TO... THE IMMUNE SYSTEM



1PM | 1 HOUR | £6/#SCIFIVE £5 | SUMMERHALL ANATOMY LECTURE THEATRE

The immune system is central to human health and the focus of much medical research. Growing understanding of this crucial system in the body has led to major breakthroughs in medicine. **Prof Paul Klenerman** – a specialist in infectious diseases – describes the immune system, and how it works in health and disease. He discusses some of the more recent advances in harnessing the immune system for immunotherapies, for example in the treatment of cancers.

Presented by Oxford University Press

THE FUTURE OF HUMAN SEXUALITY



AGES 18+ DISCUSSION

5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL ANATOMY LECTURE THEATRE

Technology is pushing human sexuality into uncharted terrain. From sex bots to virtual fantasies and teledildonics, the way humans can express love and intimacy is changing. But what does this mean for our relationships? Join us for this special discussion as we explore the past, the present and the future of sex.

NASA'S NEWEST RECRUIT



AGES 18+ DISCUSSION

5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL RED LECTURE THEATRE

Looking for a career change? Did you want to be NASA's recently advertised Planetary Protection Officer? As the number and range of space careers available expands, you could become the next Moon miner, galactic architect or even alien cultural exchange officer. With science writer and broadcaster **Marcus Chown** and space career experts, discover the wealth of new jobs our explorations into space could offer.

REALISTIC AGEING



AGES 18+ DISCUSSION

6.30PM | 1 HOUR | £5 | ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

Will you age gracefully? Chronological age only tells us a number and is probably the least useful measure of aging that we have. By using topics from popular media, **Dr Martin Wilson**, Fellow of the Royal College of Physicians of Edinburgh, will highlight some of the major themes that determine how successfully, or otherwise, adults age. Learn about the realities of ageing and how to plan ahead in order to enjoy life to the full for as long as possible.

Presented by Royal College of Physicians of Edinburgh

NIGHT OUT IN THE BIPOD



AGES 18+ SPECIAL EVENT

8PM | 90 MINS | £12/£10 | SUMMERHALL DISSECTION ROOM

Join your colleagues at the bio-bar for post-work drinks after a busy first week in our new Mars colony. The journey to Mars has been a long one with a small crew. You have left family members behind and signed up for a whole new life. Get sealed in to catch up with our mission leader **Helen Keen** and members from the European Space Agency to see how creating our new colony will affect our social lives and interactions. What does it mean to not interact with the outside world?

THE £1 MEAL



AGES 18+ SPECIAL EVENT

8PM | 90 MINS | FREE (DONATIONS WELCOME)

SUMMERHALL | MAIN HALL

The UK has created a hugely unequal society in which some workers go home with millions while other families can't make ends meet. Why is one of the wealthiest countries in the world failing to feed its people? And how do we make sure to keep our diets healthy, even on a low budget? Over a delicious three course meal that costs less than £1, a panel of experts in nutrition, food policy and social activism will discuss how we can create a fairer and healthier society. This is a 'pay what you feel' event with proceeds donated to the Trussell Trust.

SHOULD WE GIVE UP MEAT TO SAVE THE PLANET?



AGES 18+ DISCUSSION

8PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

Our food systems are a major cause of environmental damage, linked to greenhouse gas emissions, loss of biodiversity and deforestation. Researchers and policymakers are encouraging us to adopt sustainable diets, but how do we make the right choices? And should we – as suggested by recently published guidelines in Sweden and the Netherlands – be reducing meat and dairy as these have the greatest environmental impact? Or should we be supporting our farmers because, in the UK, livestock production is such an important part of our economy? Join us for presentations, discussion and a selection of sustainable snacks.

Presented by The University of Edinburgh

ALSO ON TODAY

ONGOING EXHIBITIONS

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10AM–5PM | WILDLIFE PHOTOGRAPHER OF THE YEAR | P.33

10AM–5PM | ECOVILLE | P.36

10AM–5PM | EXISTENCE: LIFE AND BEYOND | P.36

10AM–6PM | TRANSLATING TRAVELS | P.45

11AM–6PM | COLLECTING SHADOWS | P.33

11AM–6PM | SYNTHETICA | P.35

RECURRING EVENTS

10AM + 2PM | DEEP TIME WALK | P.43

FUTURE INNOVATION SHOWCASE



11AM – 4PM | DROP-IN | FREE (NO BOOKING REQUIRED)

EDINBURGH CENTRE FOR CARBON INNOVATION

Join The University of Edinburgh and the Edinburgh Centre for Carbon Innovation for an open day showcasing the latest low carbon technologies that are set to transform our future. This includes top-of-the-range electric vehicles, e-bikes, start-up business innovations and student-led initiatives.

Presented by the Edinburgh Centre for Carbon Innovation and The University of Edinburgh

THE AGE OF PERFECTION: BODIES, SOCIAL MEDIA AND LIFESTYLE



12.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

We live in the age of the 'selfie', where we are bombarded with constant messages about physical standards of 'perfection'. Is beauty only confined to physical appearance? Pressures to conform to look a certain way can lead to unhealthy lifestyle choices, such as excessive gym use and dieting, use of unnecessary supplements and misuse of illicit drugs. Take part in the conversation and discover how education, regulation and culture can contribute to supporting the community in making healthy lifestyle choices.

CABARET OF DANGEROUS IDEAS: TACKLING CLIMATE CHANGE



1.30PM | 90 MINS | £5 | EDINBURGH CENTRE FOR CARBON INNOVATION

Join us for this stimulating panel discussion, where we will explore the impact we have on the environment around us. Following the success of the 2017 *Cabaret of Dangerous Ideas*, we're inviting back a top panel of speakers, including academics, comedians, and entertainers, to explore one of the most pressing climate change issues facing the world.

Presented by the Edinburgh Centre for Carbon Innovation and The University of Edinburgh

DISCOVERING NEW WORLDS THROUGH WRITING: A CREATIVE WRITING WORKSHOP



2PM | 2 HOURS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | ANATOMY LECTURE THEATRE

For those of us who are not astronauts, there is still a way for us to think about setting foot on new moons and new planets for the first time: through writing! Join science fiction author **Oliver Langmead** and award-winning writer **Ruth EJ Booth** for a workshop where you will be given prompts to write and read aloud short excerpts, considering the trials and triumphs of explorers as they set foot on Mars and beyond. It will be an afternoon of getting creative, thinking about new technologies and unforeseen hurdles that might help or hinder humanity as we explore the universe outside our own small planet.

MODEL ORGANISMS AND MAKING MUTANTS



2PM AND 6PM | 3 HOURS | £15 | SUMMERHALL

ASCUS LAB

Join us in ASCUS Lab for a hands-on workshop that explores how and why animal models are vital for furthering heart health research. This workshop will also uncover the creative ways genetic modification enables a range of scientific imaging techniques that continue to make heart disease and function visible. *Anyone under 18 must be accompanied by a guardian and they must also purchase a ticket.*

Presented by Ascus Art & Science

THE PARIS AGREEMENT: TODAY AND TOMORROW



3PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5 | NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

In 2016, the UK became the 111th country to ratify the Paris climate agreement, which aims to avoid the most devastating effects of climate change by cutting carbon emissions. Last year, the US backed out of the global effort, although many American cities, businesses and states have pledged to adopt the goals of the agreement. Join former Chief Scientist of the Met Office **Dame Julia Slingo**, environment journalist and author of *The Ethical Carnivore* **Louise Gray**, a medical doctor and an investment expert to explore whether these goals can be achieved. Take a look at what the agreement means for the UK, for our lives and now for the lives of future generations.

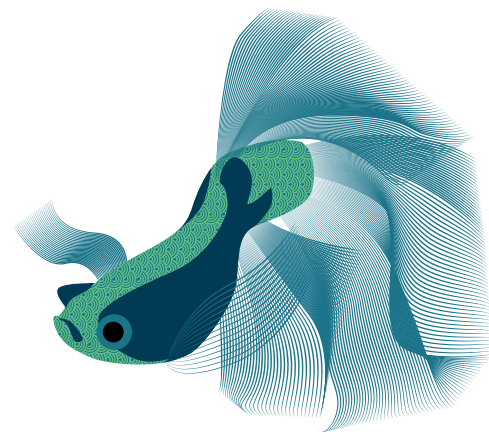
LIFE AND SOIL OF THE PANTRY



3PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

How much do we really know about the earth in which our food grows? Join our host **Pete Ritchie** from Nourish Scotland, as we hear from soil scientists experts who will share their knowledge of the hugely complex world beneath our farmers' feet, and admit that we know less than you might think about how the soil works. We will demonstrate the life and soul of cultivated soil with local samples, discover what makes some areas more productive than others and predict what current global practices will mean for the future of food.



WEIRD MATHS: AT THE EDGE OF INFINITY AND BEYOND



3PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | MAIN HALL

Could we ever see the world in 4D? Is anything truly random? Does infinity actually exist?

David Darling and extraordinary child prodigy **Agnijo Banerjee** draw connections between the cutting edge of modern maths and life as we understand it. Looking at puzzles and paradoxes, mind-bending concepts and surprising solutions, this is for anyone who wants life's questions answered – even those you never knew to ask.

Presented by Oneworld Publications

THE DAY WITHOUT A YESTERDAY



5.30PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | MAIN HALL

The greatest discovery in the history of science is that there was a day without a yesterday. The Universe has not existed forever, it was born. It erupted into being in a titanic fireball called the Big Bang. Join science writer and broadcaster **Marcus Chown** to discuss the questions it raises, such as: What was the Big Bang? What drove the Big Bang? And what happened before? The latter is the most awkward question of all, and why most scientists had to be dragged kicking and screaming to the idea of the Big Bang.

RETURNING TO OUR ROOTS



5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | ANATOMY LECTURE THEATRE

In today's disposable world, how often do we stop to consider how much work goes into the clothes we wear and food we eat and if the price we pay is fair? Some people – like **Miriam Lancewood**, author of *Woman in the Wilderness*, who has been living in the wilderness for over 7 years – are absorbing these costs themselves. She hunts, forages and repairs everything she needs. Join her in conversation with author of *The Ethical Carnivore*, **Louise Gray**, as they explore how to go back to our independent roots.

MINDBLOWING MATERIALS



5.30PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

Every well-made object, from a bridge to a spoon, is not just a piece of 'stuff' but a testimony to the ability of our species to take raw materials and turn them into things of use, value and beauty. In this jaw-dropping event we look at some of the most amazing materials known to man. Hear how spider silks can self-assemble into a micro-machine. Also, discover where you can find the strongest material on earth and how to build a space elevator. With live demonstrations by material scientist **Dr Jamie Gallagher** and spider silk expert **Prof Fritz Vollrath**, you will touch, hear and see things you wouldn't believe.

BAKING IN SPACE



8PM | 90 MINS | £12/£10 | SUMMERHALL

DISSECTION ROOM

How can a retro dessert explain how astronauts safely return to Earth? What connects molten sugar and micro-meteorite protection? How would you even bake bread in space? Join **Andrew Smyth**, aerospace engineer and *Great British Bake Off* finalist, and scientist, performer and explorer **Dr Niamh Shaw** on a gastronomic journey into orbit. This interactive event, with special guests from the European Space Agency, will explore the surprising connections between everyday bakes and the extraordinary engineering that helps keep astronauts alive in space. Your curiosity will be whisked, stirred, and taken out of this world, proving once and for all that baking really is rocket science.

STRANGER THAN FICTION – THE PANEL GAME



8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | MAIN HALL

A panel game with a difference – it's the panel vs the audience! The Science Festival's most popular lie-busting show is back for its third year. A motley team of non-fiction writers will try to pull the wool over your eyes by sneaking some surprising facts amongst ridiculous fiction and persistent science myth. Each round has a different flavour, ranging from short fictional speeches to quickfire truth-or-fiction. Get ready to make some noise!

Presented by Stranger Than Fiction

INTRODUCING THE SCIENCE FESTIVAL'S YOUTH CONSULTATION GROUP...

We are the Youth Consultation Group for the Edinburgh International Science Festival. We are working on ideas and making decisions that will help the Festival connect with audiences of our own generation.

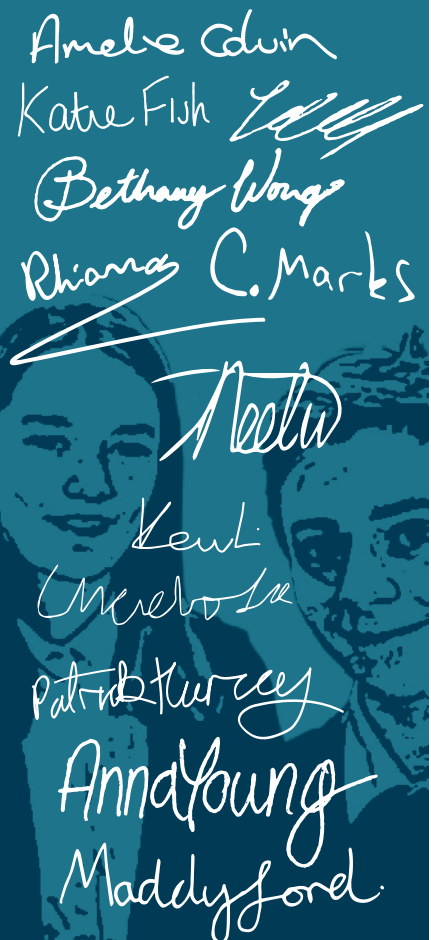
We are assisting in the creative development of the Festival's 2018 theme: *Life, the Universe and Everything*. We're working on innovative events and fresh experiences which are relevant to us and the upcoming world of science, technology, engineering and mathematics.

Look out for more information about us and the events we are working on at sciencefestival.co.uk/youth-consultation-group and on social media.



SUPPORTED BY

year of young people
bliadhna na h-òigridh
2018



ALSO ON TODAY

ONGOING EXHIBITIONS

10AM–5PM | CELEBRATING CORDELIA FINE | P.33

10AM–5PM | WILDLIFE PHOTOGRAPHER OF THE YEAR | P.33

10AM–5PM | ECOVILLE | P.36

10AM–5PM | EXISTENCE: LIFE AND BEYOND | P.36

11AM–6PM | COLLECTING SHADOWS | P.33

11AM–6PM | SYNTHETICA | P.35

WATER OF LEITH DEBRIS
DISCOVERY DAY

10.30AM | 3.5 HOURS | FREE (BOOKING REQUIRED)

WATER OF LEITH VISITOR CENTRE

Swap the sweaty crowds of Princes Street for the cool glades of the Water of Leith. Get your hands and feet wet and join in the launch of the Water of Leith Conservation Trust 2018 Spring Clean Up of Edinburgh's river. Find out what lurks in one of Edinburgh's natural wonders, then hear a tale by storyteller **Alette Willis**.

Wellies or sturdy shoes needed. Gloves, litter pickers and recycling stations will be provided.

Presented by Water of Leith Conservation Trust

SCIENCE FESTIVAL
CHURCH SERVICE

11.30AM | 1 HOUR | FREE | ST GILES' CATHEDRAL

The Lord Provost of Edinburgh and the Minister of St Giles' Cathedral invite you to the annual church service celebrating the Edinburgh International Science Festival.

FOUR-LEGGED FRIENDS
WITH BENEFITS

2PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

We love our pets, with around 44% of the UK's population owning some kind of animal. What inspired us to keep pets and why do we continue to do so? Bring along your fluffy friends and join **Dr Jill MacKay**, author of upcoming book *Animal Personality*, to discover why our pets are so important to our lives and the benefits they bring us. Pets welcome!

AN EASY GUIDE TO
ETHICAL SHOPPING

2PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

We are buying more than ever before and our insatiable appetite for fast fashion is putting pressure on industry and the environment. With so many labels on our products promising fair trade and a greener world, even shopping for socks can become a weighty world of defining your values for the best cost. It's easy to get tangled up in issues happening far away on little information when all you want is to restock the fridge. We've invited expert in ethical consumerism **Dr Joanna Long** and *Making Good* podcast creator and ethical business coach **Jen Gale** to cut through the greenwash and give us some guidelines to navigate our shopping lists without compromising on our values.

OUR NANO WORLD



2PM AND 6PM | 3 HOURS | £15

SUMMERHALL | ASCUS LAB

Join us and **Dr J. Olof Johansson** in ASCUS Lab to uncover light's ability to control electrons and molecular materials. Working with life on a nanoscopic scale is essential to furthering current understanding of life, but what is the nanoscopic scale? How do scientists visualise the work they do, when the things they research are simply not visible with the naked eye?

Anyone under 18 must be accompanied by a guardian, also with a ticket.

Presented by ASCUS Art & Science

LET'S END THE
GENERATION WAR

3PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | MAIN HALL

The current rift between the generations – mainly those known as millennials and baby boomers – is growing. Speaking about the benefits of cross-generational interactions and presenting their experiment for Channel 4, *Old People's Home for 4 Year Olds*, we are joined by chartered physiotherapist **Dr Melrose Stewart** and gerontologist **Prof Malcolm Johnson**. *This is a relaxed event with refreshments available.*

A SOLAR-POWERED LIFE



5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

Join **Prof Neil Robertson**, Chair of Molecular Materials at the University of Edinburgh and our expert panel to find out how a solar panel works, the benefit of putting PV cells on our roofs and the future of solar energy in Scotland. You will be introduced to the working of photovoltaics and find out when and how to use solar power as we separate fact from fiction in a discussion about the race to create a carbon neutral future.

42 WAYS TO SEE A TUMOUR



5.30PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | ANATOMY LECTURE THEATRE

Modern medical imaging allows doctors to visualise disease processes in exquisite detail, and is often essential to provide a diagnosis and guide life-saving procedures. Complex tumours can require many different types of imaging, but when should we stop to prevent drowning doctors in data and wasting resources? **Dr Michael Jackson**, consultant radiologist at the Royal Hospital for Sick Children, Edinburgh, will discuss the real-life case of a child with an exceptionally rare tumour to explain how different imaging techniques led to a life-saving diagnosis and will offer his personal take on the joys and challenges of his work.

FRANKENSTEIN'S
LEGACY: WHO ARE YOU
CALLING MONSTER?

5.30PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

In 1818, Mary Shelley's *Frankenstein* created a monster. Now, to celebrate the novel's 200-year anniversary, three writers from the Scottish Book Trust's New Writers Awards programme have been commissioned to create new stories and poems inspired by this landmark work. Join us for a discussion of *Frankenstein* and to hear **Anna Stewart**, **Robert McGinty** and **Molly Vogel** read from their own takes on *The Modern Prometheus* as we look at the role of science and technology in creating and controlling human life, consider the wonder, diversity and potential of life and – in the case of Victor Frankenstein – the potential consequences when the act of creation goes awry!

Presented by the Scottish Book Trust

MONDAY 9 APRIL

HOW TO START AN ELECTRIC CAR



8PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5 | SUMMERHALL DISSECTION ROOM

Ever wondered how an electric car works? And how a transport system of electric vehicles could work? Find out by joining **Dr Liana M. Cipcigan**, Cardiff University's School of Engineering and Co-Director of the Electric Vehicle Centre of Excellence and our panel of leading experts in automotive technology as they take you on a journey of electrification. Come along to discover the implications that this technology will have on our environmental footprints and our ability to get around in the future.

WHAT DOES A ROBOT THINK ABOUT WHEN NO ONE IS AROUND?



8PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5 | SUMMERHALL ANATOMY LECTURE THEATRE

Join **Oliver Lemon**, Professor of AI, Heriot-Watt University and anthropologist and AI expert **Dr Beth Singler** from the Faraday Institute for Science and Religion at the University of Cambridge for a whistle-stop tour inside the brains of the brightest robot recruits. We will discuss what it takes to make robots that can navigate real-world environments and understand the needs of humans. There will also be a chance to code your own robot, and find out what challenges researchers are solving to create a future full of useful robotic friends.

THE SURVIVAL OF NOTHING: IS EXTINCTION IMPORTANT?



8PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5 | SUMMERHALL | RED LECTURE THEATRE

There is a ringing cry of 'save the animals'! But should we be playing with nature? Join this debate on extinction, led by paleontologist **Dr Steve Brusatte**, author of the new book *The Rise and Fall of the Dinosaurs* and science advisor for BBC's *Walking With Dinosaurs*, asking how it has changed our planet in the past and whether by helping species return from the brink we are ensuring a better future. And should we really be trying to save ourselves from extinction?

ALSO ON TODAY

ONGOING EXHIBITIONS

10AM-5PM | CELEBRATING CORDELIA FINE | P.33
10AM-5PM | WILDLIFE PHOTOGRAPHER OF THE YEAR | P.33
10AM-5PM | ECOVILLE | P.36
10AM-5PM | EXISTENCE: LIFE AND BEYOND | P.36
11AM-6PM | COLLECTING SHADOWS | P.33
11AM-6PM | SYNTHETICA | P.35

RECURRING EVENTS

7.45PM | SKEPTICS AT THE SCIENCE FESTIVAL | P.39

A VERY SHORT INTRODUCTION TO... OCEANS



1PM | 1 HOUR | £6/#SCIFIVE £5 | SUMMERHALL ANATOMY LECTURE THEATRE

Oceans are hugely important – as a source of food and mineral wealth, as homes for a vast variety of wildlife, and for the role they play in climate regulation. Here, sedimentologist and oceanographer **Prof Dorrik Stow** explores everything about oceans, and reveals why the new knowledge gained of the ocean-Earth systems and their interaction with the human environment is vital to our understanding of how we can preserve them.

Presented by Oxford University Press

LET'S TALK FRANKLY



5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5 | SUMMERHALL | ANATOMY LECTURE THEATRE

Commemorating the 200th anniversary of the publication of Mary Shelley's *Frankenstein*, Edinburgh Napier University's **Dr Sarah Artt** hosts a cross-disciplinary panel including her partner in *The Age of Frankenstein* research project **Dr Emily Alder**, **Kate Horsley**, author of *The Monster's Wife*, and anthropologist and AI expert **Dr Beth Singler** from the Faraday Institute for Science and Religion at the University of Cambridge. Join them to dissect the cultural influence of this seminal work, and – as we inch closer to waking our own 'nearly human' AI creations – connect the novel's themes to contemporary issues facing scientists working today.

Supported by

Edinburgh Napier UNIVERSITY

THE SEARCH FOR LIFE IN THE UNIVERSE



5.30PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5 | SUMMERHALL | RED LECTURE THEATRE

What is out there? This question raises profound scientific questions, explored within the Festival's theme of *Life, the Universe and Everything*. How did life originate on Earth? How has life persisted on Earth for over three billion years? Is there life elsewhere in the Universe? What is the future of life on Earth? Astrobiologist **Prof Charles Cockell** from The University of Edinburgh tries to answer all of these and more in the hunt for life out there.

PATRICK GEDDES: BUILDING OUTLOOKS



6.30PM | 90 MINS | £7/£5 | PATRICK GEDDES CENTRE

Sir Patrick Geddes (1854-1932) was a Scottish sociologist and pioneering town planner, known for his innovative thinking in the fields of urban planning and sociology. Come and learn how his legacy continues to inspire the work of both the Scottish Historic Buildings Trust and the Royal Zoological Society of Scotland.

Presented by RZSS Edinburgh Zoo

Image: Dougie Barrett Photography

THE SCIENCE OF FOOD



8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5 | SUMMERHALL | DISSECTION ROOM

From pressure-cookers to pasteurisation, **Marty Jopson**, resident scientist on BBC's *The One Show* takes us on a tour of the 21st century kitchen and the everyday miracles that we all take for granted. From mind-boggling microbiology to ingenious gadgets, *Science of Food* will fascinate foodies. By understanding the chemistry, physics and biology of our food, we can all become better cooks and better consumers.

Presented by Michael O'Mara Books Ltd

ALSO ON TODAY

ONGOING EXHIBITIONS

10AM–5PM | CELEBRATING CORDELIA FINE | P.33

10AM–5PM | WILDLIFE PHOTOGRAPHER OF THE YEAR | P.33

10AM–5PM | ECOVILLE | P.36

10AM–5PM | EXISTENCE: LIFE AND BEYOND | P.36

10AM–6PM | TRANSLATING TRAVELS | P.45

11AM–6PM | COLLECTING SHADOWS | P.33

11AM–6PM | SYNTHETICA | P.35

RECURRING EVENTS

7.45PM | SKEPTICS AT THE SCIENCE FESTIVAL | P.39

A VERY SHORT INTRODUCTION TO... CANCER



1PM | 1 HOUR | £6/#SCIFIVE £5 | SUMMERHALL

ANATOMY LECTURE THEATRE

Cancer is a problem that touches virtually everyone, either directly or indirectly. As one of the biggest killers in the Western world it is feared by many people. In this *Very Short Introduction*, **Prof Nick James**, co-founder of the CancerHelp UK website, examines the trends and treatment of cancer, looking at efforts to develop treatments, research into cures, and the future of cancer care.

Presented by Oxford University Press

SCIENCE BEHIND THE SCENES



5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

Join us for an eclectic exploration of the science that happens behind the scenes at National Museums Scotland. From collecting evidence of prehistoric animals in Skye to research into knitting by numbers, these bite-sized presentations give a fascinating glimpse into the range of scientific activities undertaken every year by curators and collections scientists.

Presented by the National Museum of Scotland

CLIMATE CHANGE: IS IT TIME FOR EXTREME MEASURES?



5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | ANATOMY LECTURE THEATRE

A three-degree rise in global temperature is the current estimated 'tipping point', after which global warming could run out of control, leaving us powerless to intervene. The Paris Agreement on climate change estimated that greenhouse gas emissions need to peak in the next five years, which could be an improbable goal. Geoengineering, a deliberate large-scale intervention in the Earth's natural systems, for example injecting sun-blocking particles into the atmosphere, could be a plan B. But how feasible is such an ambitious project and how would it be regulated? Join human rights expert **Dr Sam Adelman**, *Carbon Brief* editor **Leo Hickman** and **Dr Matthew Watson** who led the SPICE (Stratospheric Particle Injection for Climate Engineering) Project to discuss geoengineering and its potential global impact.

ASTRONOMY ON TAP: EDINBURGH FESTIVAL BREW



7PM | 3 HOURS | FREE | THE TRON

Astronomy on Tap... Because Science is Better with Beer! Created in New York City by Meg Schwamb, currently a Postdoctoral Fellow at the Institute of Astronomy and Astrophysics, Academia Sinica (Taiwan); there are now over 20 regular satellite events up and running across the USA and Europe. This free event features three accessible, engaging science talks on Life (astrobiology), the Universe (cosmology) and Everything (mystery topic...!) by presenters from local research and educational institutions. There will be games and prizes to test and reward and time to ask questions and interact with the presenters and other scientists. Grab a pint, and join our universe!

GENERATION WEBB



8PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

The Hubble Space Telescope has achieved global fame since its launch back in 1990, producing iconic images and astounding discoveries about our Universe. As we approach the launch of the James Webb Space Telescope, it's time to meet a different kind of space telescope built for the next generation of cosmic explorers. Could this new model possibly eclipse its famous predecessor? Join astronomers **Dr Marek Kukula**, **Prof Gillian Wright** and others to decide for yourself.

Presented by Royal Observatory Edinburgh (UK Astronomy Technology Centre). Image: NASA, Marshall Space Flight Centre, David Higginbotham.

SCIENCE AND THE SPIRIT OF SCOTLAND



8PM | 1 HOUR | £12/£10 | SUMMERHALL

DISSECTION ROOM

An in-depth look at the art and science of making, blending and tasting Scotch whisky with psychologist and gastrophysicist, **Prof Charles Spence**; whisky writer and cook, **Rachel McCormack**; philosopher of the senses, **Prof Barry C Smith**; and whisky blender, **Rachel Barrie**. Together they will guide you through talks, tastings, and the occasional experiment, to discover more about the science and culture of Scotland's national drink.

Presented by The University of London

A SNAPSHOT OF THE STARS



8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | ANATOMY LECTURE THEATRE

Astrophotography – like the breathtaking and inspiring photographs produced by the Hubble space telescope – has been capturing imaginations for decades. Here on Earth, you may not be Hubble, but you can still take amazing photographs of the stars. Join photographer **Stuart Dreghorn** to find out how to start taking amazing photos of the stars. Whether you're using a simple mobile phone camera or one with more in-depth settings, you'll be seeing stars through the lens.

AN INTERFERING CONVERSATION ABOUT THE QUANTUM WORLD



8PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

In quantum physics, what a physical system does depends on the possible alternative paths available to it. The alternatives interfere with each other and this phenomenon of quantum interference means that in speaking of the quantum world, we seem to have to walk what the particle physicist Richard Feynman called 'a logical tightrope'. How should we picture the quantum world whilst walking this tightrope? Join comedian and radio presenter **Susan Morrison** and theoretical physicist **Prof Fay Dowker** for a discussion on quantum mechanics, logic, spacetime and the role of mathematics in science.

Presented by the International Centre for Mathematical Sciences

WEDNESDAY 11 APRIL

ALSO ON TODAY

ONGOING EXHIBITIONS

10AM–5PM | CELEBRATING CORDELIA FINE | P.33

10AM–5PM | WILDLIFE PHOTOGRAPHER OF THE YEAR | P.33

10AM–5PM | ECOVILLE | P.36

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11AM–6PM | COLLECTING SHADOWS | P.33

11AM–6PM | SYNTHETICA | P.35

RECURRING EVENTS

7.45PM | SKEPTICS AT THE SCIENCE FESTIVAL | P.39

URBAN EXPLORATION



11AM | 90 MINS | £3 | JUBILEE GARDENS

Take some time to stop and smell the flowers. Getting out into nature can be of great benefit, but how far do you have to go to find it? Join the Water of Leith Conservation Trust for a stroll along the water and discover just how much nature is hidden in our urban environment. NB Come dressed for the weather!

Presented by the Water of Leith Conservation Trust

A VERY SHORT INTRODUCTION TO ... BLOOD



1PM | 1 HOUR | £6/#SCIFIVE £5 | SUMMERHALL

ANATOMY LECTURE THEATRE

Blood is vital to most animals. Playing a central role in life, it has had profound cultural and historical significance and plays an important role in religious ritual. Blood was one of the four humours in early Western medicine and is still probably the major diagnostic tool in the doctor's armoury. Biochemist **Prof Chris Cooper** analyses the components of blood, explains blood groups, and looks at transfusions, blood tests and blood-borne diseases. He considers what the future may hold, including the possibility of making artificial blood and producing blood from stem cells in the laboratory.

Presented by Oxford University Press

REALISTIC MEDICINE. DATA AND ME



5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5 | NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

Realistic Medicine puts the person receiving care at the heart of decision-making and creates a personalised approach to how this is given. It aims to reduce harm and waste and simplify care while managing risk and innovating to improve. Join Scotland's Chief Medical Officer, **Dr Catherine Calderwood** and a panel of experts from healthcare, data science and academia to hear this discussion on the role that innovations in data will play in the delivery of *Realistic Medicine*, and what this means for you.

Presented by Cancer Innovation Challenge@The Data Lab

THE ANTIBIOTIC CRISIS:
WHO IS TO BLAME?

6.30PM | 1 HOUR | £5

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

The rise of antimicrobial resistance has been described as a global health crisis that threatens to undermine much of modern medicine and healthcare. How should we react? Is this a crisis rooted in our hospitals, or should we be more concerned about our GPs? Who should we listen to when we hear contradictory advice about whether or not to go on taking antibiotics, even once we feel better? This is your opportunity to hear the latest thinking on these issues from **Prof Mark Woolhouse**, expert in infectious disease epidemiology, chaired by **Prof Derek Bell**, President of the Royal College of Physicians of Edinburgh.

Presented by the Royal College of Physicians of Edinburgh

ARUP LECTURE:
FUTURE TRANSPORT

8PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

Digital technologies are transforming our transport systems and fully automated travel will soon revolutionise how we get around. However, are these technologies taking advantage of our new understanding of movement and passenger preferences, or are we merely replicating old systems and infrastructure? Join **Isabel Dedring**, former London Deputy Mayor for Transport and Arup's Global Transport Leader, to explore how these technologies could – or might not – make our cities safer, healthier and more convenient.

Supported by

ARUP

A CELEBRATION OF
WOMEN IN ASTRONOMY

8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

Prof Dame Jocelyn Bell Burnell, first female president of the Royal Society of Edinburgh, is an astrophysicist best known for her discovery of pulsars, considered to be one of the greatest astronomical discoveries of the twentieth century. Join her as she tells the stories of several remarkable women in astronomy, and reflects on the position of women in astronomy worldwide today.

WHAT MAKES US AFRAID?



8PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | ANATOMY LECTURE THEATRE

Fear is part of being human and probably the most crippling of our emotions, so why do we seek it out? What draws us to the horror genre and why are we afraid of seemingly innocent things like clowns? Be prepared to face your phobias as we are joined by journalist of strange things, **Linda Rodriguez McRobbie**, lecturer in psychology **Dr David Carmel** and **Stephen Volk**, writer of the notorious BBC TV 'mockumentary' *Ghostwatch*, which terrified the nation, even reputedly causing PTSD in children.

THE CLIMATE MAJORITY



8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

Drawing on opinion polls, psychological research and examples of successful campaigns from across the globe, **Leo Barasi** investigates the causes of climate apathy. Barasi discusses how it prevents action to stop climate change and reveals how it can be beaten using an approach developed for political campaigns. Who are the 'swing' voters? How can we talk about climate change in a way that will change the way they think? Discover this and more in this compelling talk.

Presented by New Internationalist

ALSO ON TODAY

ONGOING EXHIBITIONS

10AM–5PM | CELEBRATING CORDELIA FINE | P.33

10AM–5PM | WILDLIFE PHOTOGRAPHER OF THE YEAR | P.33

10AM–5PM | ECOVILLE | P.36

10AM–5PM | EXISTENCE: LIFE AND BEYOND | P.36

10AM–6PM | TRANSLATING TRAVELS | P.45

11AM–6PM | COLLECTING SHADOWS | P.33

11AM–6PM | SYNTHETICA | P.35

RECURRING EVENTS

6.30PM | NEW WEAPONS, NEW WOUNDS | P.40

7.45PM | SKEPTICS AT THE SCIENCE FESTIVAL | P.39

NATURAL SCIENCES
COLLECTION TOUR

10.30AM | 75 MINS | £6/£5

NATIONAL MUSEUMS COLLECTION CENTRE

From minuscule insects to mighty whales, the Natural Sciences collection documents the incredible diversity of life on Earth, helping us to understand the world around us. Join Natural Sciences curators and conservators to tour selected highlights of this remarkable collection held at the National Museums Collection Centre in Granton.

Presented by the National Museum of Scotland

A VERY SHORT
INTRODUCTION
TO... MAMMALS

1PM | 1 HOUR | £6/#SCIFIVE £5 | SUMMERHALL

ANATOMY LECTURE THEATRE

Dr Tom Kemp discusses the great diversity of mammalian species, and looks at how their very disparate characteristics, physiologies and behaviours are all largely driven by one unifying factor: warm-bloodedness. Describing the wonderful adaptations that mammals evolved to suit their varied modes of life, he also looks at the mainly tree-living primates that culminated ultimately in *homo sapiens*, AKA humans.

Presented by Oxford University Press

FACTFULNESS



5.30PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

Inspiring and revelatory, *Factfulness* is a book of stories by late international statistics sensation Hans Rosling along with **Ola Rosling** and **Anna Rosling-Rönnlund**. When you ask people simple questions about global trends, they systematically get the answers wrong. How many young women go to school? What's the average life expectancy across the world? Join Ola and Anna, who will be talking about their work with Hans Rosling.

Presented by Hodder & Stoughton Ltd

BAD WAYS TO DIE



5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | ANATOMY LECTURE THEATRE

Join **Dr Amy Pedersen** from the School of Biological Sciences, University of Edinburgh and **Dr Claire Ferraro**, a Kings Sierra Leone Partnership Ebola Doctor, to find out about the diseases you wish you'll never have and ends you'll never meet. From incurable viruses, weird and wonderful bacteria and venomous shadow-dwellers, prepare to be amazed at the multitude of ways we can fail to live. Our panel will provide some tips in ways to avoid the worst of the world's diseases and venoms, and will shine some light on the mechanisms with which they can get the better of us.

THE NEW WILD:
WHY INVASIVE SPECIES WILL
BE NATURE'S SALVATION

6PM | 90 MINS | £8/£6 | ROYAL BOTANIC GARDEN

EDINBURGH | LECTURE THEATRE

From parakeets to Japanese knotweed, invasive non-native species are accused of harming our 'native' wildlife. Environmental journalist **Fred Pearce** challenges this widespread view and asks whether demonising these species is justified by science. In the vast majority of cases these species are model ecological citizens and some of the perceived 'problem' species may even be the crucial first step towards repairing ecological damage caused by human actions and interventions. Maybe it is time we learnt to love this 'new wild'?

Presented by Royal Botanic Garden Edinburgh

LOST VOICE GUY



8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

Lee Ridley, AKA Lost Voice Guy, can't talk, but isn't silent. One of the UK's first stand-up comedians to use speech synthesis technology, for one night only Lee will perform his laugh-out loud comedy set at the museum.

Presented by the National Museum of Scotland

Image: Caroline Briggs

DNA. RACE AND IDENTITY



8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

A misunderstanding of ancestry, inheritance and genetics has become the ultimate manifestation of identity politics. The trivial end of this is fuelled by direct-to-consumer genetic testing companies which promise to reveal your ancestral roots. At its most pernicious though, Neo-Nazis are turning to DNA to assert racial purity and superiority, and companies sell tests to erroneously prove membership to indigenous tribes in the Americas. How do we address such a profound and politically charged misunderstanding of genetics? Explore these ideas and more with geneticist and BBC Radio 4 presenter **Dr Adam Rutherford**.

FRIDAY 13 APRIL

CAN SCIENCE FICTION
SAVE US?

8PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | ANATOMY LECTURE THEATRE

With predictions of food shortages, overpopulation, extreme weather events and a new home planet, it is beginning to sound like Earth is part of a science fiction novel. Can science fiction really find a way out of our troubles? We team up with local science fiction magazine *Shoreline of Infinity* to deliver a Science Festival special of their monthly science fiction event, *Event Horizon*. Join us for an evening of poetry, performance and reading followed by a discussion with science fiction authors **Paul McAvley**, **Anne Charnock** and others. We pit science against science fiction in an attempt to solve some of the world's sustainability issues and ask how possible are science fiction innovations today?

HOW TO WIN THE
LOTTERY AND GET AWAY
WITH MURDER

8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

Interpreting what statistics reported by the media really mean is vital in helping us to decide how to live our lives. We are constantly bombarded with big numbers in the news, but how worried should we actually be about these statistics? Expert statistician **Dr Liberty Vittert** will analyse the headlines to find out what – if any – truth there is in them and show us how we can turn these numbers to our own advantage.

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10AM–5PM | ECOVILLE | P. 36

10AM–5PM | EXISTENCE: LIFE AND BEYOND | P. 36

10AM–6PM | TRANSLATING TRAVELS | P. 45

11AM–6PM | COLLECTING SHADOWS | P. 33

11AM–6PM | SYNTHETICA | P. 35

A VERY SHORT
INTRODUCTION TO...
MEASUREMENT

1PM | 1 HOUR | £6/#SCIFIVE £5 | SUMMERHALL

ANATOMY LECTURE THEATRE

Measurement is a fundamental concept that underpins almost every aspect of the modern world. It is central to the sciences, social sciences, medicine, and economics, but also affects everyday life. We measure everything – from the distance of far-off galaxies to the temperature of the air, levels of risk, political majorities, taxes, blood pressure, IQ, and weight. In this *Very Short Introduction*, **Prof David Hand** explains the history and mathematics of measurement, and the main approaches and challenges involved across disciplines, policy and our lives.

Presented by Oxford University Press

FIGHTING FAKE FACTS



5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

Following one of the most politically divisive campaigns the UK has seen in recent times, we are living in a post-truth world. Here, Brexit shattered dreams and friendships. In the US, the election of Trump has brought social unrest echoed throughout the world. How can we fight fake facts and become better at separating truth from falsehoods? And what (if anything) can we do to break out of the cycle of increasing hostility towards those views differ to our own? Join ex-Buzzfeed science writer **Tom Chivers**, neuroscientist **Dr Kris De Meyer**, **Richard Smith**, managing editor of *NewsThump* and host, science writer **Dr Kat Arney** to find some answers.

SPACE OUTLAW



5.30PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

What are the laws in space? And how are they enforced? Join space law experts **Joanne Wheeler MBE** and **Dr Chris Newman** to play the jury in a series of example cases that could become more and more common as the number of countries and private companies leaving Earth for space increases. Does anyone own the Moon? Would you let someone else remotely fix your satellite with a robot in space? You decide!

LEAVING PLANET EARTH



8PM | 90 MINS | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | DISSECTION ROOM

For 250,000 years, humans have been firmly rooted to the Earth. And, sure, it's got some good things going for it: nice views, friendly people, good coffee... But what if you want to leave? If you're looking for a complete change of scene, or just a bit of a break join science writer and broadcaster, **Dallas Campbell** for an informative and entertaining discussion taking in human space travel, cosmology and space science as he presents his top tips for leaving the planet.

DREADING FRIDAY THE 13TH:
HOW COGNITIVE SCIENCE
EXPLAINS SUPERSTITION

8PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5

SUMMERHALL | RED LECTURE THEATRE

Friday the 13th is the most superstitious date on the calendar, and many people still feel a vague sense of unease when making plans for that particular day. Superstition is alive and well, but why are so many people still superstitious? Could it be something to do with the natural way in which human minds work? Is being superstitious harmless or can it even be beneficial? Join psychologist **Dr Stuart Wilson** to investigate these questions, offering a journey through the psychology behind our superstitious beliefs.

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11AM–6PM | SYNTHETICA | P.35

#PIANODROME WOOD ID WORKSHOP



11AM | 2 HOURS | £15/£12 | ROYAL BOTANIC GARDEN EDINBURGH | INVERLEITH HOUSE

The average piano is made up of between 8 and 16 different species of wood. Each part is designed carefully to achieve a very specific purpose – the hammers must be tough, the soundboard should be resonant and the outer shell beautiful. Join **Daniel Ridley-Ellis** and **Stefan Lehneke** from the Centre for Wood Technology at Edinburgh Napier University and **Andrew Gibson** of the Wood Technology Society to discover which wood is used for each part of the piano and how to tell your beech from your birch.

Presented by Royal Botanic Garden Edinburgh

WHAT DOES THE FUTURE HOLD FOR DEMENTIA?



12.30PM | 90 MINS | FREE (BOOKING REQUIRED)

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

How close are we to finding a cure for Alzheimer's disease? Get an insight into the latest research working towards this goal in this session chaired by **Prof Tara Spire-Jones**. She will be discussing her work looking at vital brain connections and how they are disrupted in Alzheimer's disease. Join the discussion with guest panel, **Prof John Starr**, **Dr Tom Russ** and **Prof Craig Ritchie**, all of whom will be sharing their views and studies into this disease. Submit your own questions ahead of the event by tweeting @cendemprevent.

Presented by The University of Edinburgh and Alzheimer's Research UK Scotland Network

#PIANODROME TREE TOUR



1PM | 1 HOUR | £6/£4 | ROYAL BOTANIC GARDEN EDINBURGH | INVERLEITH HOUSE

Meet the piano maker's favourite trees at the Royal Botanic Garden. This guided tour is specially produced to celebrate the installation of the 100-seater #Pianodrome amphitheatre at the Garden and will visit tree species which have been used to build pianos over the centuries. Ideal for tree lovers and musicians alike.

Presented by Royal Botanic Garden Edinburgh

EVERYTHING YOU KNOW ABOUT GENETICS IS WRONG



3PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5 | NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

Many of us learn about genetics in school starting with Mendel and his pea plants. We learn that one gene is linked to one trait, and one gene fault causes one disease. But the recent revolution in DNA sequencing is revealing that it's much more complicated. People are not peas – and even peas are not peas! From strange patterns of inheritance, to real life genetic superheroes living among us whose DNA provides them with resilience against serious illnesses, science writer and broadcaster **Dr Kat Arney** explains what we do and don't know about how our genes work.

#PIANODROME FUNDRAISER



7PM – 10PM | 3 HOURS | £12/£10 | ROYAL BOTANIC GARDEN EDINBURGH | INVERLEITH HOUSE

An evening of music, dance, dynamic artworks and storytelling exploring the mathematics of sound and geometry. With interactive artworks created by the team that is building a #Pianodrome amphitheatre made out of discarded pianos, live performances from Edinburgh's dynamic musical explorers *Sink* and a special collaboration with the *Tinderbox Collective* spanning five exhibition rooms in Inverleith House. This event is raising money for the build of the #Pianodrome.

Presented by Royal Botanic Garden Edinburgh



LIFE



THE UNIVERSE



AND EVERYTHING

SUNDAY 15 APRIL

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11AM–6PM | COLLECTING SHADOWS | P.33

11AM–6PM | SYNTHETICA | P.35

EDINBURGH MINI
MAKER FAIRE

SPECIAL EVENT

10AM–5PM | DROP-IN | £6/FREE UNDER 3 | SUMMERHALL

Join us for our sixth *Edinburgh Mini Maker Faire* – the Greatest Show (and Tell) on Earth!

The Faire is a gathering of creators from Edinburgh and beyond who will showcase the things they make and do. From engineers to artists, to scientists and crafters, *Mini Maker Faire* is a chance for these 'makers' to show off hobbies, experiments, projects and ideas.

Part of the worldwide 'Maker Movement', *Edinburgh Mini Maker Faire* is a celebration of human invention, creativity and resourcefulness. It is the only Faire of its kind in Scotland, and a rare chance to see a collection of the nation's most talented creatives all under one roof!

Make:
makezine.com

Edinburgh Mini Maker Faire is independently organised and operated under licence from Maker Media Inc

THE ANGRY CHEF: BAD
SCIENCE AND THE TRUTH
ABOUT HEALTHY EATING

3PM | 1 HOUR | £8.50/£6.50/#SCIFIVE £5 | NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

When people lie about food, that is when Angry Chef comes out. Whether it is the latest insta-star, celebrity diet guru, fitness blogger or self-appointed nutrition expert, Angry Chef is there to say 'What does this really mean?' Using insight from psychiatrists, behavioural economists, food scientists and dieticians, **Anthony Warner** unravels why sensible, intelligent people are so easily taken in by the latest fads, giving you the tools to spot pseudoscience for yourself.

Presented by Oneworld Publications

TAM DALYELL
PRIZE LECTURE

6PM | 90 MINS | FREE (BOOKING REQUIRED)

PLAYFAIR LIBRARY

The Tam Dalyell Prize for Excellence in Engaging the Public with Science is an annual prize to recognise and reward The University of Edinburgh's outstanding science communicators. In this year's Tam Dalyell lecture, **Dr Niki Vermeulen**, **Dr Bill Jenkins** and team will present their project *Curious Edinburgh*, a virtual walking tour of our city of ideas that explores Edinburgh's role in the history of science, technology and medicine. The lecture will include tasters of existing tours and explore future plans to connect with Edinburgh's local communities and showcase the city's international connections. For more information on the *Curious Edinburgh* project, visit curiousedinburgh.org

Presented by The University of Edinburgh

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BOOKING HOTLINE: 0844 557 2686

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK

BOOKING INFORMATION

All ticket prices include booking fees

ONLINE

sciencefestival.co.uk

If you experience any issues while attempting to make an online booking please email the Box Office: boxoffice@scifest.co.uk.

PHONE

0844 557 2686

Wednesday 7 February–Friday 30 March:

10.30am–5.30pm (Monday–Friday)

Saturday 31 March–Sunday 15 April: 8.30am–

6pm (Monday–Saturday), 11am–4pm (Sunday)

Please note that calls to the box office cost between 2p and 7p per minute plus your phone company's access charge. Calls from a mobile phone may be more expensive.

IN PERSON

Edinburgh Festival Fringe Shop

180 High Street, Edinburgh, EH1 1QS

10.30am–5.30pm (Monday–Friday)

If tickets for your event are available, they can be purchased at the venue 30 minutes prior to the start time.

GROUP DISCOUNTS

We welcome groups to the Science Festival and discounts may be available depending on the event and party size. Please call the Box Office on **0844 557 2686** to discuss your needs.

CONCESSIONS

Unless otherwise stated, concessions are available to pensioners, the unemployed and disabled persons, with a complimentary ticket available for carers, which can be booked by phone or in person at our Box Office.

Students and teachers can access #scifive £5 tickets for most of our adult events. See more information on p.32.

For all concession tickets, proof of status may be required.

REFUNDS

All Science Festival tickets are non-refundable, except in the case of cancellation.

ACCESSIBILITY

If you would like a copy of the brochure in a different format contact marketing@scifest.co.uk or call **0131 553 0320**. Access information for each of our venues is available from the venue section of our website sciencefestival.co.uk/venues. If you have special access requirements or need to book wheelchair spaces please call our Box Office on **0844 557 2686**.

Please note: Summerhall is a B-listed venue and although reasonable adjustments have been made to the venue in order to provide access to customers with disabilities, we regret to say that the Dissection Room and Red Lecture Theatre are only accessible by the stairs. Full details are available at summerhall.co.uk.

FILMING AND PHOTOGRAPHY

Filming and photography will take place at Science Festival events and may be used for future promotional purposes. If you have any concerns please speak to a member of staff at the event.

GETTING HERE

Many of our venues in the city centre are easily accessible on foot or by public transport. Please consider using public transport when visiting our events.

BY BUS

See the venue list on page 56 for bus listings to each of our venues. Please visit lothianbuses.com or call **0131 555 6363** for further information.

BY TRAIN

For Scottish train travel information and tickets, visit scotrail.co.uk. For National Rail enquiries, see nationalrail.co.uk or call **0845 748 4950**.

BY BIKE

Plan your journey at cyclestreets.net.

BY CAR

There are multi-storey car parks and metered parking around the city centre.

Please consider the environment when planning your travel to and from our events. Keep in mind that many of our venues are easily accessible on foot or by public transport.

TOURIST INFORMATION

Further information on Edinburgh and the surrounding area, along with accommodation listings and online booking, is available at visitscotland.com.

EDINBURGH INTERNATIONAL SCIENCE FESTIVAL

Edinburgh International Science Festival is a high profile and dynamic educational charity. Each year it delivers one of Europe's largest science festivals; a primary school education programme which tours across Scotland; an innovative STEM careers event and a variety of international projects including its role as a major programming partner for the Abu Dhabi Science Festival.

Registered Charity no. SC003790

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EDUCATION AND OUTREACH

In addition to our Festival we deliver an extensive education programme, inspiring Scotland's young learners with the wonder of science and technology and helping teachers deliver the Curriculum for Excellence. *Generation Science* brings interactive science shows and workshops to primary schools all over the country and *Careers Hive* gives thousands of secondary pupils a unique immersive STEM focused careers experience. Find out more at sciencefestival.co.uk/education.

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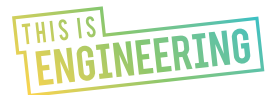
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Generation Science Club is a network of individuals and companies who encourage the next generation to engage with science, technology, engineering and maths. *Generation Science* travels to primary schools all across Scotland, delivering world-class shows and workshops. By donating funds to support our work, *Generation Science Club* members ensure that our activities can be enjoyed by all pupils – wherever they are and whatever their economic background.

GENERATION SCIENCE CLUB MEMBERS IN 2018

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And to all those who prefer to remain anonymous



To find out more please contact our Development team on **0131 553 0324** or email development@scifest.co.uk. Further information is available online at sciencefestival.co.uk/support-us.