

#

EDINBURGH
SCIENCE
FESTIVAL

ED
SCI
FEST
2020



4-19 APRIL

SCIENCEFESTIVAL.CO.UK

BOOKING HOTLINE: 0131 226 0005

WITH SPECIAL THANKS TO OUR SUPPORTERS

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ELEMENTARY

We share our planet with almost eight billion people and the collective environmental challenges we face have never been greater or more complex. Increasing demands for food, water, energy and infrastructure are pushing nature to its limits, and the impacts of the climate emergency we are facing are increasingly more apparent. Life on Earth is a wonderful yet fragile thing.

We live in uncertain times but with uncertainty comes possibility. With our climate in crisis and our world in turmoil, buffeted by false news and media manipulation, it has never been more important to shine a spotlight on the threats, challenges and opportunities that face planet Earth. To champion reasoned and rational thought and the value of evidence, and to help equip the public and our policy makers with information that helps them make informed decisions about the things that matter most. We are the custodians of planet Earth and our responsibility to ourselves and to future generations sits at the heart of our 2020 *Elementary* themed programme.

From biodiversity, ecology and food security (earth) and clean air/pollution (air) to energy and climate policy (fire) and marine biodiversity and water security (water) we place our focus firmly on our environment and on asking how we ensure a successful and sustainable future.

As some of the ancients did, we add a fifth element, with a special focus on the digital world (our 'aether') and on how we can merge creative technology with live events to create new experiences for our audiences. We want to take our work to ever wider and more diverse audiences, and to deepen our audiences' experience we will be doing more online. Plus of course, there's the usual wonderful mix of science of all sorts, for all ages, in a packed two-week programme of workshops, shows, exhibitions and special events across Edinburgh and beyond.

Join us this April as we explore science's role in addressing the biggest global environmental (elemental!) challenges and helping to secure a more sustainable future.



Festival and Creative Director,
Edinburgh Science

BOOKING INFORMATION

sciencefestival.co.uk

If you experience any issues while attempting to make an online booking, please email the Box Office at boxoffice@scifest.co.uk.

0131 226 0005

Thursday 20 February – Friday 27 March:

10.30am–5.30pm (Monday–Friday)

Saturday 28 March – Sunday 19 April:

8.30am–6pm (Monday–Saturday), 11am–4pm (Sunday)

Box Office

Edinburgh Festival Fringe Shop

180 High Street, Edinburgh, EH1 1QS

10.30am–5.30pm (Monday–Friday)

If tickets for your desired event are available they can be purchased at the venue 30 minutes prior to the start time.

DISCOUNTS

Early Bird

Save £2 per ticket on selected events in our adults and young people programme at Pleasance and the National Museum of Scotland if booked before Friday 20 March. Call the Box Office or book online using the code EARLYBIRD20. #SCIFIVE tickets and some other events may be excluded. Search EARLYBIRD20 on our website for details.

Adults go free to City Art Centre at Easter

Book a child's day pass for City Art Centre and receive free adult entry on Friday 10, Saturday 11 and Monday 13 April. Call the Box Office or book online – simply add a child's pass and an adult pass to your basket and use the promo code EASTEREGG20.

#SCIFIVE

Are you sci-curious? Students and teachers can claim £5 tickets for most Science Festival events – everything from engaging workshops and discussions to a great night out! Look out for the #SCIFIVE tag as you browse event listings.

Groups

We welcome groups and discounts may be available depending on the event and the size of the party. Please call the Box Office on 0131 226 0005 to discuss your needs.

Babes in arms

Children under three years old do not require a ticket for events, except if the event is specifically for children under three years old.

Concessions

Unless otherwise stated, concessions are available to pensioners, the unemployed and disabled persons, with a complimentary ticket available for assisting companions, which can be booked by phone or in person at our Box Office.

REFUNDS

All Science Festival tickets are non-refundable, except in the event of a cancellation.

ACCESSIBILITY

If you would like a copy of this brochure in a different format, please contact marketing@scifest.co.uk or call 0131 553 0320. Access information for each of our venues is available on p.4–5 and at sciencefestival.co.uk/venues. If you have specific access requirements or need to book wheelchair space, please call the Box Office on 0131 226 0005.



WHAT'S ON?

Workshops and activities for children and families. A day pass allows you to access all events.

OPEN SATURDAY 4 APRIL–SATURDAY 18 APRIL
(NOT SUNDAYS), 9.30AM–4.30PM
2 MARKET STREET, EDINBURGH, EH1 1DE

During the Science Festival we transform City Art Centre's gallery spaces into a sensational science playground for families, packed with workshops, shows, art and interactive activities.



VENUE SPONSOR

As well as being Scotland's largest producer of low carbon electricity, EDF is investing in engaging and inspiring the next generation of Scottish minds. Each year, EDF welcomes thousands of school children through the doors of our visitor centres at Hunterston B and Torness, and through EDF Renewables we support Edinburgh Science's *Generation Science* outreach programme.

edfenergy.com



WHAT'S ON?

Interactive activities for families, exhibitions for all and discussions for adults and young people. Times and dates vary, see event listings for details.

OPEN SATURDAY 4 APRIL–SUNDAY 19 APRIL, 10AM–6PM
INVERLEITH ROW, EDINBURGH, EH3 5LR

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. Working as part of the SEFARI collective of Scottish Environment, Food and Agriculture Research Institutes the Garden offers a programme of family-friendly activities reflecting current research. Look out for the series of sustainability-themed events that are part of the *Think Plastic* exhibition exploring the role of plastic in our society.



Celebrating
350 years
1670–2020

Royal Botanic Garden Edinburgh



WHAT'S ON?

Free drop-in activities, workshops and exhibitions for families and adults. Bookable workshops and talks for all ages. Times and dates vary, see event listings for details.

OPEN SATURDAY 4 APRIL–SUNDAY 19 APRIL
10AM–5PM AND EVENINGS FOR EVENTS
CHAMBERS STREET, EDINBURGH, EH1 1JF

One of Edinburgh's most iconic buildings, the National Museum of Scotland houses treasures from around the world, all under one roof. During the Science Festival you'll find special events and exhibits for all ages. There are also bookable talks and workshops. In the evenings and at weekends, don't miss our exciting programme of discussions and debates.



THE UNIVERSITY OF EDINBURGH

The University of Edinburgh works in partnership to connect science and society to make the world a better place. Discover science with real scientists from The University of Edinburgh during the Science Festival. Visit the Learning Centre for family-friendly activities and workshops and keep an eye out for adult events throughout the programme.



THE UNIVERSITY
of EDINBURGH



WHAT'S ON?

Free drop-in activities and workshops for families and adults. Shows and activities for families and young people, discussions, debates and interactive events for adults. Times and dates vary, see event listings for details.

OPEN SATURDAY 11 APRIL–SUNDAY 19 APRIL, 10AM–11PM
60 PLEASANCE, EDINBURGH, EH8 9TJ

VENUE SPONSOR

Every day, hundreds of millions of consumers worldwide rely on Cirrus Logic's low-power, mixed-signal integrated circuits to enjoy great user experiences in the realms of audio, voice and touch. From our headquarters in Austin, Texas, and with major facilities in Edinburgh, London and Newbury, Cirrus Logic's technology connects people with the world around us.

cirrus.com

Pleasance is one of Edinburgh's best-loved festival venues and this year Edinburgh Science Festival can be found serving science, innovation and creativity across its spaces. Enjoy Easter with us at *Dinosaur Weekend* and explore all things prehistoric in this massive takeover event. We have a new immersive *Cyber Zone* for tech-lovers and our special family science zone, *Experimentarium*, will be returning Monday 13–Friday 17 April.





WHAT'S ON?

Interactive exhibits and events for families, and adults. Times and dates vary, see event listings for details.

DURING THE FESTIVAL DYNAMIC EARTH IS OPEN EVERY DAY FROM 10AM – 5.30PM (LAST ADMISSION 4PM) HOLYROOD ROAD, EDINBURGH, EH8 8AS

Dynamic Earth is a five-star visitor experience which invites you to take a journey through time to witness the story of planet Earth. It features a series of interactive exhibits, state of the art technology and even a 4D encounter – you will feel the heat of a bubbling volcano, face the chill of polar ice and fly across the globe before crash landing in a tropical rainforest!

During the Science Festival, Dynamic Earth is host to an awe-inspiring sculpture of *Gaia*, hands-on activities, workshops, discussions and interactive events for adults. You'll even have the chance to sit back and relax in our Dome and watch a movie or two in 360°.



WHAT'S ON?

Art exhibitions, theatre, film screenings and talks for all ages. Times and dates vary, see event listings for details.

**OPEN SATURDAY 4 APRIL – SUNDAY 19 APRIL, 11AM – 11PM
1 SUMMERHALL, EDINBURGH, EH9 1PL**

Based in the former Royal Dick School of Veterinary Studies, Summerhall is a major creative venue for the arts with a host of performance, gallery and workshop spaces, as well as a welcoming café and bar.

During the Science Festival you'll find art exhibitions, artist talks, theatre and film screenings. There are breath-taking exhibitions, immersive environments, and activities too.



SUMMERHALL
Open Minds Open Doors



WHAT'S ON?

Interactive exhibits and events for families and adults. Times and dates vary, see event listings for details.

**OPEN SATURDAY 4 APRIL – SUNDAY 19 APRIL, 10AM – 6PM
134 CORSTORPHINE ROAD, EDINBURGH, EH12 6TS**

For a great day out this Easter, you can't beat Edinburgh Zoo. World-class attractions and an extensive animal collection will provide you and your family with memories to last a lifetime! Discover a range of science events and activities in addition to all the usual animal antics.



FACILITIES AND ACCESS

- Wheelchair access throughout
- Elevator
- Ramp access
- Level access throughout
- Accessible toilet
- Changing places toilet
- Lowered counters
- Access aware staff
- Hearing loop
- Exhibition transcripts
- Assistant dogs welcome
- Low lighting
- Cafe
- Bar
- Packed lunch area
- Water available
- Cloakroom
- Buggy park
- Baby changing
- Parking
- Mobility scooters and wheelchairs available to book in advance

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. With events in Edinburgh, surrounding boroughs and even some of Scotland's picturesque coastal towns, the Edinburgh Science Festival is crossing boundaries in 2020.

You'll find a full list of venues on and more information on our website at sciencefestival.co.uk/venues.

ELEMENTS OF THE EDINBURGH SCIENCE FESTIVAL



In a year that sees the 50th anniversary of Earth Day – generally regarded as the birthdate of the modern environmental movement – we are using the ancient classifications of earth, air, fire and water, as well as our added fifth element ‘aether’, as a way of exploring creative thinking, science, technology, engineering and maths, and the roles they play in addressing some of the biggest challenges that face us as individuals, societies and as a planet.

CHILDREN AND FAMILIES

FROM P.42–65

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.

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.

ADULTS AND YOUNG PEOPLE

FROM P.8–41

Our adult and young adult programme is designed for visitors aged 12+. This is a recommendation only and younger visitors are very welcome. Be sure to take a look at our Youth Consultation Group's recommendations of events for young people (p.21).

A small number of events have an enforced age limit. This restriction is in place due to event content and/or venue licensing laws and you may be asked for proof of age.



Earth and its inhabitants are under pressure from environmental degradation and climate change, but there's room for hope. We're exploring ways of protecting natural land diversity, balancing our growing populations and how we might sustainably move towards our future.

FOR CHILDREN AND FAMILIES

| | |
|------|---|
| P.9 | GAIA AT DYNAMIC EARTH 10PM–4PM 4–22 APRIL DYNAMIC EARTH |
| P.50 | ELEMENTS IN THE PARK 1PM 7 APRIL HOLYROOD PARK INFORMATION CENTRE |
| P.57 | OPERATION: PLANT HEALTH 11AM–4PM 13–17 APRIL PLEASANCE |
| P.57 | KEEP YOUR CROPS WATERED 11AM–4PM 15–17 APRIL PLEASANCE |
| P.55 | THINK PLASTIC 2PM 18 APRIL ROYAL BOTANIC GARDEN EDINBURGH |
| P.65 | SPACE APE BY ANDY CANNON 3PM 18 APRIL SCOTTISH STORYTELLING CENTRE |

FOR ADULTS AND YOUNG PEOPLE

| | |
|------|--|
| P.12 | POPULATION FACTS OR FAKE NEWS 3PM 4 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.16 | ADAPT OR DIE 5.30PM 8 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.24 | HOW HUMANS ARE ALTERING LIFE ON EARTH 5.30PM 14 APRIL PLEASANCE |
| P.29 | DISASTER BY CHOICE 5.30PM 16 APRIL PLEASANCE |
| P.30 | UGLY ANIMAL PRESERVATION SOCIETY 6PM 16 APRIL PLEASANCE |
| P.32 | A VERY SHORT INTRODUCTION TO... EXTINCTION 1PM 17 APRIL PLEASANCE |



ALL FIRED UP

We face a climate emergency and the seriousness of the threat climate change presents to the sustainability and security of the planet has reached unprecedented levels. Discover the steps required to create a cleaner, greener planet and the opportunities this presents.

FOR CHILDREN AND FAMILIES

| | |
|------|---|
| P.48 | ELEMENTARY BLUEPRINT 11AM–6PM 4–19 APRIL STILLS CENTRE FOR PHOTOGRAPHY |
| P.52 | MAKING CIRCLES 11AM AND 2PM 9–10 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.55 | ZOO ECO-DETECTIVES 11AM–4PM 11 APRIL EDINBURGH ZOO |
| P.60 | OUR LIVING PLANET 10AM–4PM 15 APRIL DYNAMIC EARTH |
| P.64 | POLAR ICE WORLDS 10AM–4PM 18–19 APRIL DYNAMIC EARTH |
| P.65 | CARBON CITY ZERO CARD GAME 1PM–5PM 19 APRIL PLEASANCE |

FOR ADULTS AND YOUNG PEOPLE

| | |
|------|--|
| P.19 | CLIMATE SICKNESS 12.30PM 11 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.22 | SCOTLAND'S ENERGY QUADRILEMMA 5.30PM 13 APRIL PLEASANCE |
| P.25 | THE FOUR-DAY WEEK 8PM 14 APRIL PLEASANCE |
| P.27 | EDINBURGH MEDAL ADDRESS 7PM 15 APRIL CITY CHAMBERS |
| P.39 | CONSUME, DISCARD, REPEAT 12.30PM 19 APRIL PLEASANCE |
| P.41 | 10 CLIMATE COMMANDMENTS 8PM 19 APRIL PLEASANCE |



ÆTHER GO DIGITAL

We live in the Information Age; information is everywhere, technology is embedded in every aspect of our daily lives. Learn more about the power we hold at our fingertips.

FOR CHILDREN AND FAMILIES

| | |
|------|--|
| P.48 | HANDS-ON ROBOTS 10AM–5PM 4–5 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.47 | ELEMENTAL 11AM–6PM 4–11 APRIL SUMMERHALL |
| P.55 | TALOS HUMANOID ROBOT SHOWCASE 10AM–5PM 11–12 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.57 | GADGET FACTORY 10AM, 11.30AM, 1.30PM AND 3PM 13–14 APRIL PLEASANCE |
| P.57 | ELECTRONIC MUSIC: BEGINNERS 11AM AND 2PM 13 APRIL PLEASANCE |
| P.59 | LIGHTS, CAMERAS, SCIENCE! 11AM AND 2PM 14 APRIL NATIONAL MUSEUM OF SCOTLAND |

FOR ADULTS AND YOUNG PEOPLE

| | |
|------|--|
| P.21 | CYBER ZONE VARIOUS TIMES 13–19 APRIL PLEASANCE |
| P.22 | 5G: WHAT'S IN IT FOR ME? 6PM 13 APRIL PLEASANCE |
| P.24 | ADDICTED TO GAMES 6PM 14 APRIL PLEASANCE |
| P.34 | THE WORLD OF AI-POWERED CREATIVITY 7.30PM 17 APRIL PLEASANCE |
| P.36 | DEEP DIVE INTO DEEPFAKES 5.30PM 18 APRIL PLEASANCE |
| P.40 | THE EMOTIONAL ROBOT REVOLUTION 7.30PM 19 APRIL PLEASANCE |



THE AIR WE BREATHE

Earth has a breathable atmosphere; a rare and precious resource, but one we continue to pollute. Learn about how we harness the power of the wind and about fuel alternatives that will help preserve the purity of the air we breathe.

FOR CHILDREN AND FAMILIES

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|------|--|
| P.44 | ENERGY MAKERS 10AM–4PM 4–18 APRIL CITY ART CENTRE |
| P.49 | IT'S ALL CONNECTED 10AM–5PM 6–10 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.60 | THE WHIRLYBIRD 11AM AND 2PM 15 APRIL PLEASANCE |
| P.61 | IMAGINARY ENERGY 6PM 15 APRIL ROYAL BOTANIC GARDEN EDINBURGH |
| P.62 | CAR OF THE FUTURE 11AM AND 2PM 16 APRIL PLEASANCE |
| P.63 | ONE LITTLE WINDMILL: RHYMES AND STORIES 11AM 17 APRIL PLEASANCE |

FOR ADULTS AND YOUNG PEOPLE

| | |
|------|---|
| P.16 | LET ME BREATHE 8PM 8 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.24 | ROADS RE-IMAGINED 5.30PM 14 APRIL PLEASANCE |
| P.29 | A VERY SHORT INTRODUCTION TO...RENEWABLE ENERGY 1PM 16 APRIL PLEASANCE |
| P.31 | A HYDROGEN POWERED FUTURE 8PM 16 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.33 | ELECTRIC FUTURES 6PM 17 APRIL PLEASANCE |
| P.37 | THE GLOBAL CLEAN AIR CRISIS 7.30PM 18 APRIL PLEASANCE |

Wind is the flow of gases on a large scale. On the surface of the Earth, wind is the movement of air. Wind is caused by differences in the atmospheric pressure. Wind is the movement of air in atmospheric pressure from the higher to the lower pressure. Wind is the movement of air in winds of various speeds. Wind is the movement of air will also be affected by the temperature and the humidity of the air. Wind is the movement of air except for the air that is not moving.



WATER FOR LIFE

We're surrounded by vast bodies of essential and life-giving water but our relationship could be in trouble if we don't protect it. Celebrate our connection with Scotland's incredible coasts and dive in for a series of wonderful water events.

FOR CHILDREN AND FAMILIES

| | |
|------|---|
| P.47 | PALE BLUE DOT 10AM–5PM 4–19 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.46 | SEABIRD CATAMARAN CRUISES TIMES VARY 4–19 APRIL SCOTTISH SEABIRD CENTRE |
| P.51 | SEASHORE SAFARI 10AM 8 APRIL PORTOBELLO |
| P.53 | SEASHORE NATURE DETECTIVES 2PM 9–10 APRIL FISHERROW HARBOUR |
| P.53 | ROCKPOOL RAMBLES 11AM 10–12 APRIL SCOTTISH SEABIRD CENTRE |
| P.63 | EUROPEAN STONE STACKING CHAMPIONSHIPS TIMES VARY 17–19 APRIL DUNBAR |

FOR ADULTS AND YOUNG PEOPLE

| | |
|------|--|
| P.10 | SCOTLAND'S PRECIOUS SEAS 10AM–5PM UNTIL 28 JUNE NATIONAL MUSEUM OF SCOTLAND |
| P.15 | OCEAN THREADS 11AM–5PM 7–19 APRIL (NOT 12 APRIL) EDINBURGH COLLEGE OF ART |
| P.18 | EXPLORING THE FIVE DEEPS 7PM 10 APRIL DYNAMIC EARTH |
| P.33 | LIFE ON THE REEF WITH CALLUM ROBERTS 6PM 17 APRIL PLEASANCE |
| P.37 | COASTS AND COCKTAILS 8PM 18 APRIL PLEASANCE |
| P.41 | WHISKY AND WATER 8PM 19 APRIL PLEASANCE |

YEAR OF COASTS AND WATERS 2020

In 2020, Scotland celebrates its coasts and waters with a year-long programme of events and activities which will shine a spotlight on these vital elements of our landscape. Find out more at visitscotland.com/ycw2020 Join the conversation #YCW2020



Scottish Government
Riaghaltas na h-Alba
gov.scot

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

WELCOME TO THE SCIENCE FESTIVAL

EVENTS FOR ADULTS AND YOUNG PEOPLE

We've grouped some highlights below but over the next few pages you'll find details of events suitable for everyone ages 12 and over.

To view our programme for children and families, head to p.42-65.

FIND YOUR PERFECT MATCH

BRIGHT NIGHTS

With comedy, music, theatre and interactive events – there's a science night out to suit everyone. Luke Jerram's incredible scale version of Earth is blended with science, music and poetry in *An Evening with Gaia* at Dynamic Earth and don't miss the chance to science up your life with Edinburgh's musical quiz sensation, *Jukebox Bingo* (p.28). Food, drink and science combine in the most delicious way possible with our *GastroFest* series (p.31) while the *Ugly Animal Preservation Society* (p.30) returns to champion the world's weirdest wonders.

IGNITE CONVERSATIONS

We love to spark debate and cover the world's hottest topics (pun intended). We're *All Fired Up* about climate change so join Edinburgh Science's director Simon Gage to find out why *This is An Emergency* (p.25) and help us understand how to reduce our carbon footprint in *10 Climate Commandments* (p.41). We're also exploring topics from *The Air We Breathe* to *Water for Life* (p.6-7) and the *A Very Short Introduction to...* series is running 1pm daily from Monday 13 April covering intelligence, evolution, extinction and more.

STRIKING SPEAKERS

Join some of science's best communicators for some lively discussions. Radio 4's Dr Adam Rutherford explains *How to Argue With a Racist* (p.13) with science, and presenter Claudia Hammond helps us balance our busy lives in *Tired of Being Tired?* (p.35). Take a deep dive with *Blue Planet II*'s scientific advisor Prof Callum Roberts (p. 33) and explore why we laugh with Radio 4's Prof Sophie Scott in *What's So Funny?* (p.30).

CREATIVE SPARK

This year we've expanded our workshops programme for adults and young people, and there's something to suit all abilities. Head to the *Cyber Zone* (p.21) for some *Coding For Grown Ups* or *Hack Your Own Self-Driving Car*. If technology isn't your thing, why not explore the *Geo-SEW-ence of Scotland* (p.14) in a fantastic sewing-based activity, discover your inner poet in *The Science of Poetry* (p.28) or test the *Creativity of Science and Science of Creativity* (p.35) with science fiction author Laura Lam.

A small number of events have an enforced age limit like 14+ or 18+. Please pay attention to these restrictions as they are due to event content and/or venue licensing laws. Identification may be required at these events.

Science has perfected the alchemy of elements to create Bellfield Brewery beer. Hops from the earth, pure Scottish water, fire in the beer kettle and an airy head combine to form this award-winning beer.



Bellfield Brewery is the official beer partner for Edinburgh Science Festival. Visit their taproom in central Edinburgh for tours, private and corporate events and fresh beer from the brewery right next door. Visit bellfieldbrewery.com/pages/events for dates, times and booking information.



ALSO ON TODAY



SATURDAY
4
APRIL

INTO THE BLUE

EXHIBITION



PORTOBELLO PROMENADE

DAILY | DROP-IN

WED 18 MARCH – MON 27 APRIL | FREE

Water covers 71% of the Earth's surface and the planet's oceans shape our environments and landscapes, influence our climate and weather systems, and have enabled the rise and fall of civilisations. They give us food and fuel, medicine and minerals, as well as leisure and pleasure. But their supply is finite or fragile, or both – under threat from pollution, global warming and acidification, over-fishing and biodiversity loss. And that's not to mention the threats they pose to us from rising sea levels!

Scotland has some of the most beautiful and diverse marine ecosystems in the world and, in celebration of Scotland's Year of Coasts and Waters, this large-scale outdoor photography exhibition will take you on a fascinating journey around some of Scotland's most remarkable coastlines. Revealing the beauty of coastal landscapes, introducing some of the weird and wonderful inhabitants of the world beneath the waves and exploring the role seas and oceans play in our lives, *Into the Blue* is the story of our oceans' scale and majesty, their biodiversity and potential as well as the threats they face.

Images: David Bennett, Anna Deacon, David Gifford and Laurence Winram



GAIA AT DYNAMIC EARTH

SPECIAL EVENT



DYNAMIC EARTH | STRATOSPHERE

10AM–4PM | DROP-IN | ON UNTIL WED 22 APRIL

FREE WITH ADMISSION

Marvel at our planet like you've never seen it before, as Luke Jerram's stunning *Gaia* comes to Edinburgh for the first time. A huge scale model of Earth, *Gaia* is 1.8 million times smaller than the real thing, each centimetre of the artwork faithfully recreating 18km of Earth's surface. The opportunity to see our planet hanging in three dimensions, evokes the awe and wonder astronauts first experienced when viewing the globe from space. Created in partnership with the Natural Environment Research Council (NERC), *Bluedot Festival* and The UK Association for Science and Discovery Centres. With supporting partners Culture Liverpool and Liverpool Cathedral. For evening access and special events visit dynamicearth.co.uk.

Presented by Dynamic Earth

THINK PLASTIC: MATERIALS AND MAKING

EXHIBITION



ROYAL BOTANIC GARDEN EDINBURGH

JOHN HOPE GATEWAY

10AM–5.45PM | DROP-IN | ON UNTIL SUN 26 APRIL

FREE

Take a look at plastic through the prism of art. The product of artists and scientists stepping into the intriguing and complex world of 'sustainable' plastics, *Think Plastic* explores how perception of this remarkable substance has changed and how its properties have been incorporated into and influenced the work of artists. The relationship between material choices and the impact this has on our environment, highlights the urgent need for a more responsible attitude to plastic.

Presented by Royal Botanic Garden Edinburgh

PARASITES: BATTLE FOR SURVIVAL

EXHIBITION



NATIONAL MUSEUM OF SCOTLAND

EXHIBITION GALLERY 2, LEVEL 3

10AM–5PM | DROP-IN | ON UNTIL SUN 19 APRIL | FREE

Join the battle against five tropical diseases and the parasites that cause them in this interactive exhibition and discover how scientific research taking place in Scotland is leading the way in this field. Through current research, cutting-edge technologies and interactive exhibits, discover how parasites are transmitted to humans and the ways in which they are fighting back against modern medicine.

Presented by National Museums Scotland, in partnership with the University of Dundee, The University of Edinburgh and the University of Glasgow

Image: Sinclair Stammers/Reece

pale blue dot.

EXHIBITION



NATIONAL MUSEUM OF SCOTLAND | GRAND GALLERY
10AM-5PM | DROP-IN | ON UNTIL SUN 19 APRIL | FREE

'Look again at that dot. That's here. That's home. That's us.'

CARL SAGAN

To celebrate Scotland's Year of Coasts and Waters, Edinburgh Science presents a brand-new interactive exhibition, *Pale Blue Dot*.

Delve deep into our seas and oceans in this multi-sensory exploration of everything marine. Taking you through every layer of the ocean, *Pale Blue Dot* explores the vast, majesty and mystery of our seas. From curious species to amazing ecosystems, ocean bounty and intriguing research, find out what makes the marine landscape so special and how we can protect one of the most precious habitats on Earth. *Pale Blue Dot* encourages you to explore your own relationship with the oceans and discover more about the waters that surround us. Showcasing artworks from Scottish and international artists, **Marco Barotti, Hannah Imlach and Matthew Rimmer**.

Above image: Marco Barotti, below images: Hannah Imlach



SCOTLAND'S PRECIOUS SEAS

EXHIBITION



NATIONAL MUSEUM OF SCOTLAND

EXHIBITION GALLERY 3, LEVEL 1

10AM-5PM | DROP-IN | ON UNTIL SUN 28 JUNE | FREE

Discover the diversity of life in Scotland's seas and the many threats facing our marine life. Find out about the scientific research measuring the impact of our activities on the marine environment and how global climate change is affecting the wildlife in our waters.

Presented by National Museums Scotland

JULIJONAS URBONAS: PLANET OF PEOPLE

EXHIBITION



COLLECTIVE

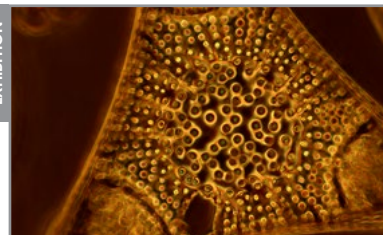
10AM-5PM | DROP-IN | ON UNTIL SUN 19 APRIL | FREE

Artist **Julijonas Urbonas**, who works between design, amusement park engineering, performative architecture, choreography, kinetic art and sci-fi, invites visitors to his exhibition to be 3D scanned and watch their images become part of an artificial planet made entirely from human bodies.

Presented by Collective

ENTANGLEMENTS OF TIME AND TIDE

EXHIBITION



EDINBURGH PRINTMAKERS

10AM-6PM | DROP-IN

ON UNTIL SUN 5 JULY (NOT MONDAYS) | FREE

Artist and researcher **Sonia Mehra Chawla's** interdisciplinary visual arts and science exhibition is the result of a two-year period of research facilitated by Edinburgh Printmakers. Working at the interface between art, science and technology, the exhibition includes new prints commissioned by Edinburgh Printmakers, along with videos, living systems and archival historical scientific material. *This project received partnership support from Marine Scotland and ASCUS Art and Science.*

Presented by Edinburgh Printmakers

Image: Sonia Mehra Chawla



Supported by the PLACE (Platforms for Creative Excellence) Programme, a partnership between the Scottish Government - through Creative Scotland - the City of Edinburgh Council and the Edinburgh Festivals



ELEMENTAL



SPECIAL EVENT

SUMMERHALL | MEET AT BOX OFFICE

11AM–6PM AND 11AM–9PM ON 7–9 APRIL ONLY (PERFORMANCES EVERY 20 MINS)

30 MINS | LAST ENTRY 5.20PM AND 8.20PM (7–9 APRIL) | ON UNTIL SAT 11 APRIL | **£5/£3**

The Ancient Greeks saw the world comprised of four elements – earth, air, fire and water (with philosopher Aristotle throwing in a fifth, aether, for good measure) that were thought to explain the nature and complexity of all matter. Times have changed. We now have atomic theory, with atoms classified into more than a hundred chemical elements. Yet, echoes of the old theory reverberate to this day and scientists admit we still don't know everything. Interact with the elements on this magical multi-sensory journey of discovery through an intriguing, immersive digital world in which magic meets alchemy and alchemy meets science. Play, discover and create with your fellow explorers. *Suitable for ages 5+ and under 14s must be accompanied by an adult. Latecomers will not be admitted.*

Presented by Bright Side Studios in association with Edinburgh Science. Bright Side Studios connect the space between art and technology to create powerful human experiences. They specialise in designing immersive environments and installations that bring stories of all sorts to vibrant life. They have a passion for playing with illusion and visual wonderment to create emotional connections with their audience.

brightsidestudios.co.uk. Commissioned by Edinburgh Science

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



Scottish Government
Riaghaltas na h-Alba
gov.scot

WHERE IS YOUR NEXT MEAL COMING FROM?



DISCUSSION

NATIONAL MUSEUM OF SCOTLAND

AUDITORIUM

12.30PM | 90 MINS | **£9/£7/#SCIFIVE £5**

Our relationship with food in Scotland is going to change over the next few years due to the effects of climate change and the adaptations in the way we grow, consume and distribute. Our role as a society is to make sure that this change is a positive one. Join our guests for a discussion about what food security really means and how we will all have to look to our roots to combat it.

Supported by

UNIVERSITY of STIRLING



SYNCRASY



EXHIBITION

SUMMERHALL | SUMMERHALL GALLERIES

11AM–6PM | DROP-IN | ALSO ON SUN 5–SUN 19 APRIL (MON–SUN)

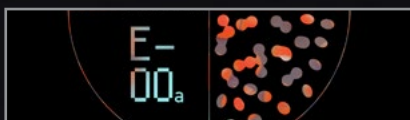
WED 22 APRIL–SUN 28 JUNE (WED–SUN) | FREE | EXHIBITION LAUNCH: FRIDAY 3 APRIL 6PM–8PM FREE

Syncrasy is a contemporary art exhibition co-curated by Summerhall and ASCUS Art & Science. Experience the work of visual artists **Beverley Hood**, **Victoria Evans** and **Sneha Solanki**, working across the fields of art, science and technology. This series of exhibitions examines the known characteristics of life within our physical world; playing with scale to capture the fleeting lifespan of living cells, the unacknowledged microbes within the food system and the infinite forces of our environment. Interact with physical matter, aethereal spaces and explore for yourself the limits of human perception and beyond.

Presented by Summerhall and ASCUS Art and Science

Image and background image: Beverley Hood

E-NUMBERS V2.0



SUMMERHALL | MEADOWS GALLERY

Probing the habitats of the 'un-natural', **Sneha Solanki** presents a new and expanding rendition of the 'E-Number' food additive system. Focusing on the emerging changes taking shape in our food landscape, this 'version 2.0' includes only micro-organisms that have been intentionally and genetically altered, created or re-programmed to produce flavours, aromas, colours, preservatives and nutrition as food additives. Consisting of bacteria, fungi, algae and viruses, the project collates references, micro-organisms and the results of their activity as additives, explored in the exhibition as a 'Micro Food Library'.

Presented by Summerhall and ASCUS Art and Science

Image: Sneha Solanki

OSCILLATIONS

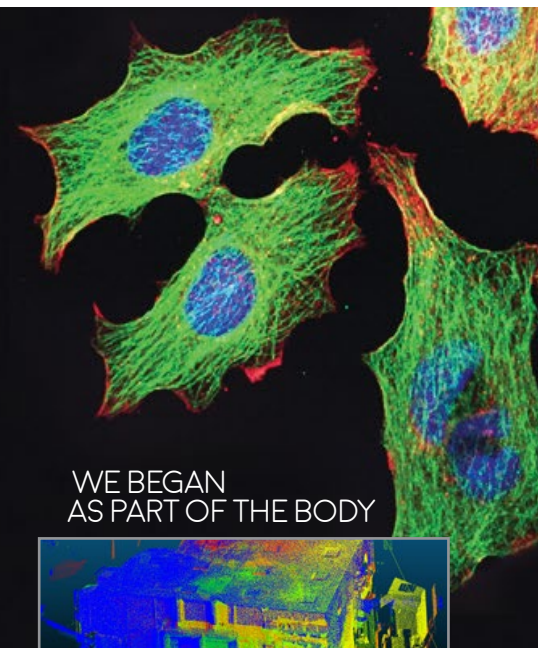


SUMMERHALL | CORNER GALLERY

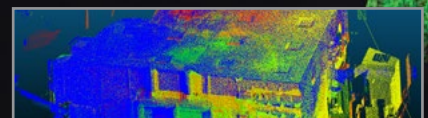
Inspired by science and the interrelatedness of the physical world, this immersive installation reflects **Victoria Evans'** interest in the way distant or invisible phenomena can have a tangible effect on our day-to-day lives. Using a process of data sonification as a starting point, Evans makes audible the rhythmic, cyclical patterns of the tides and their interplay with lunar and solar orbits throughout the course of a year. This iteration of the work has been created especially for the exhibition and incorporates the sound of Edinburgh's coastline. Produced by **Javier Aregger**.

Presented by Summerhall and ASCUS Art and Science

Image: Victoria Evans/Javier Aregger



WE BEGAN AS PART OF THE BODY



SUMMERHALL | SCIENNES GALLERY

Immerse yourself in a series of artworks that reflect complex human and ethical questions about our relationship between the body, science and technology. Inspired by the eczema genetic research laboratory of **Prof Sara Brown**, artist **Beverley Hood's** experimental exhibition tells a story as seen from the point of view of the artificial skin cells, leading you through the cells journey, during their short, precious, three week long 'in-vitro' life from operating theatre to lab, and finally to disposal. These works are presented as a sound piece, 3D prints, scientific illustrations and models, and an immersive mixed reality experience set within the installation. *Note: the mixed reality immersive experience will be available as a bookable event at set periods during the exhibition.*

Presented by Summerhall and ASCUS Art and Science

Image: Beverley Hood

CABARET OF DANGEROUS IDEAS ON THE CLIMATE CRISIS



DISCUSSION
EDINBURGH CENTRE FOR CARBON INNOVATION
 2PM | 90 MINS | £5
 Join us as some of our brightest and bravest thinkers let their most dangerous ideas loose! Questions and challenges are actively encouraged and there'll be a liberal sprinkle of entertainment from MC and comedian **Susan Morrison**. The *Cabaret of Dangerous Ideas* will give you the opportunity to engage with cutting-edge climate knowledge in the entertaining way you've been waiting for. Presented by The University of Edinburgh and the Edinburgh Centre for Carbon Innovation

POPULATION FACTS OR FAKE NEWS



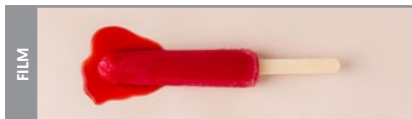
DISCUSSION
NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
 3PM | 90 MINS | £9/£7/#SCIFIVE £5
 Calling all fake news detectives for an urgent assignment! Internet and social media misinformation is spreading fast and we need to get to the bottom of it. Come along and help social science and health experts separate fact, fiction and everything in between with smartphone and tablet-based quizzes and interactive discussion. *Please bring your own smartphone or tablet with you.* Presented by Scottish Longitudinal Study and the Usher Institute, The University of Edinburgh

DINOSAURS REDISCOVERED: REWRITING HISTORY



DISCUSSION
NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
 5.30PM | 1 HOUR | £9/£7/#SCIFIVE £5
 Dinosaurs continue to be media sensations and remarkable new fossil finds are the lifeblood of modern palaeobiology. It's due to the advances in technology that we are able to dig deeper, literally and figuratively. **Prof Michael J Benton**, from the University of Bristol's Palaeobiology Research Group, explains how the study of dinosaurs has become a true scientific discipline over the past twenty years and how, with new technology, we are revealing secrets locked away in prehistoric bones. Presented by Thames & Hudson

CINEHALL: ELEMENTAL



FILM
SUMMERHALL | RED LECTURE THEATRE
 7PM | SEE WEBSITE FOR FULL LISTINGS AND DURATIONS
 ALSO ON FRI 10-SAT 11, FRI 17 AND SAT 18 APRIL | £8
 Summerhall's third season of Cinehall features a programme of documentaries and blockbusters showing both the real and imagined impact of the devastation and destruction of the natural world. Screenings throughout the Festival include; *Cane Toads: The Conquest*, *March of the Penguins*, *The Day After Tomorrow*, *28 Days Later*, *Finding Nemo* and South Korea's *The Host*. Presented by Summerhall

DYNAMIC EARTH AFTER DARK



SPECIAL EVENT
AGES 14+
DYNAMIC EARTH | STRATOSPHERE
 7.30PM | 3 HOURS | £12/£10
 Prepare for jaw-dropping beauty and stellar entertainment under the shadow of *Gaia* by **Luke Jerram**. This scale version of our home planet offers a unique opportunity to view Earth as it's seen from space while you enjoy explosive science demonstrations that showcase the incredible power of the elements - earth, air, fire and water. Experience Dynamic Earth after dark and celebrate with a special themed cocktail, elementary face painting and preview fun, interactive activities before anyone else. Presented by Dynamic Earth

REWIRING YOUR BRAIN



DISCUSSION
NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
 8PM | 1 HOUR | £9/£7/#SCIFIVE £5
 Brain injury affects 250,000 people every year and rehabilitation can take years. Join brain injury survivor **James Piercy** and neuroscientist **Dr Michael Grey** as they discuss the changing brain, recovery and even put Piercy's brain to the test. Will we see his brain change as he learns a new task? Come along and find out!

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
| P.9 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
| P.9 | GAIA AT DYNAMIC EARTH 10AM-4PM DYNAMIC EARTH |
| P.9 | THINK PLASTIC: MATERIALS & MAKING 10AM-5.45PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.9 | PARASITES: BATTLE FOR SURVIVAL 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.10 | PALE BLUE DOT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
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| P.11 | SYNCRAZY 11AM-6PM SUMMERHALL |

RECURRING EVENTS

| | |
|------|---|
| P.11 | ELEMENTAL 11AM-6PM SUMMERHALL |
|------|---|

SOME MUTE INGLORIOUS NEWTON



DISCUSSION

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
12.30PM | 90 MINS | **£9/£7/#SCIFIVE £5**

In 2018, an eminent European professor of physics caused a public stir when he claimed that “physics was invented and built by men, it’s not by invitation.” But how true is this? Join science storyteller and Director of the Scottish Festival of Physics **Siân Hickson** to explore the lives and legacies of six women who counted stars, split atoms, drew loops in the mathematics of reality and overcame the laws of the land to expound the laws of the Universe.

AIR POLLUTION: THE NEW TOBACCO



DISCUSSION

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
3PM | 90 MINS | **£9/£7/#SCIFIVE £5**

Our lungs breathe in between eight to nine thousand litres of air each day, filling our bodies with life-sustaining oxygen. But pollution of the air we all breathe is on the rise, and has been declared a public health emergency by the World Health Organisation. Join **Dr Stefan Reis**, expert in atmospheric chemistry, **Dr Mark Miller**, whose research focusses on the effects of air pollution on our cardiovascular system and Sustrans Director of Urbanism **Daisy Narayanan** to explore and unpack these issues. Hosted by **Claire Daly** from Sustrans.

ENERGISING ENGINEERING: HALF A CENTURY OF BRITISH INNOVATION



DISCUSSION

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
5.30PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

Join leading nuclear engineer **Dr Dame Sue Ion**, a Fellow of the Royal Academy of Engineering, to explore the award-winning innovations that have changed our lives for the better. Discover the UK’s rich engineering heritage including some Scottish innovations you may not have heard of, such as the world’s first bionic hand, revolutionary laser eye scanners and smart power for a new generation of energy systems. Find out about Lady Rachel MacRobert, the pioneering geologist who gave her name to the MacRobert Award for UK engineering innovation, and hear about Dame Sue Ion’s own journey into engineering.

Supported by



TAM DALYELL PRIZE LECTURE



DISCUSSION

PLAYFAIR LIBRARY | OLD COLLEGE
6PM | 90 MINS | **FREE BOOKING REQUIRED**

The Tam Dalyell Prize for Excellence in Engaging the Public with Science recognises and rewards The University of Edinburgh’s outstanding science communicators. The winner of this year’s Prize is **Dr Andrew Manches**, from the Moray House School of Education and Sport at The University of Edinburgh, for his consistent and unwavering passion to support children’s learning in the Early Years. Join Dr Manches as he illustrates how adults can support children’s learning and the potential for designing novel learning technologies.

Presented by The University of Edinburgh

HOW TO ARGUE WITH A RACIST



DISCUSSION

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
8PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

BSL INTERPRETED

Race is real because we perceive it. Racism is real because we enact it. In the new age of genomics, the appeal to science to strengthen racist ideologies is on the rise, both from the far right, and from well-intentioned non-racists. Geneticist, broadcaster and host of BBC Radio 4’s *Inside Science*, **Dr Adam Rutherford**, argues that, if understood correctly, science and history can be powerful allies against racism, granting the clearest view of how people actually are, rather than how we judge them to be.

DOME NIGHTS



FILM

DYNAMIC EARTH | SHOWDOME

6PM, 6.45PM, 8PM AND 9PM

SEE WEBSITE FOR DURATIONS

ALSO ON SAT 11–MON 13, THU 16, FRI 17 AND SUN 19 APRIL

£8/£7/£6 AND £12/£10 SEE WEBSITE FOR DETAILS

Marvel each night at an unforgettable selection of films in Dynamic Earth’s newly upgraded 6K 360° dome cinema. Screenings include awe-inspiring solar system visuals in Gustav Holst’s *Planets 360*, films inspired by the music of Pink Floyd and a selection of shows from Dynamic Earth’s daytime collection. Take the chance to view Luke Jerram’s stunning Planet Earth art installation, *Gaia* (p.9), before or after an evening of movie magic. *Age limits will vary depending on the films shown, see our website for more details.*

Presented by Dynamic Earth

DELEGATE PROGRAMME

ARE YOU PASSIONATE ABOUT ENGAGING PEOPLE WITH SCIENCE?

Our Delegate Programme is aimed at science engagement professionals, teachers, youth workers, academics and those working in creative industries. Explore behind the scenes of our world-renowned Science Festival and discover how we create and curate events, market and fundraise our activities and bring science to life in all environments. Delegates will have the opportunity to build on their own public engagement skills, meet like-minded peers and explore opportunities for future collaboration.

WEDNESDAY 15–FRIDAY 17 APRIL

THREE-DAY PASS: **£150**

ONE-DAY PASS (WEDNESDAY 15 APRIL): **£65** (PLEASE NOTE THAT THE ONE-DAY PASS PROGRAMME IS DESIGNED FOR THOSE WORKING IN AN EDUCATION SETTING)

sciencefestival.co.uk/delegate-programme



Supported by the PLACE (Platforms for Creative Excellence) Programme, a partnership between the Scottish Government – through Creative Scotland – the City of Edinburgh Council and the Edinburgh Festivals



6

APRIL

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
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RECURRING EVENTS

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| P.11 | ELEMENTAL 11AM-6PM SUMMERHALL |
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GEO-SEW-ENCE
OF SCOTLAND

DYNAMIC EARTH | DISCOVERY BASE 3
2PM | 2 HOURS | **£12**

Discover the art of geology and, stitch-by-stitch, reveal the geoSEWence of Scotland in this stitch-along workshop. Geoscientist and crafter **Dr Rachel Brackenridge** will explore how geological history has shaped our landscape while you make your very own mini cross-stitched geological map of Scotland. *No skills or experience needed. Rock specimens kindly provided by the British Geological Survey.*

GREAT VALUE UNLIMITED TRAVEL WITH
Family DAYticket
2 ADULTS UP TO 3 CHILDREN* **£9.50**
tickets Available as m-tickets using our app

**EDINBURGH
SCIENCE
FESTIVAL**
edinburghscience.co.uk

Travelling to the main venues:

City Art Centre 3, 5, 7, 8, 14, 29, 30, 31, 33, 37, 45, 49 | Pleasance 14
National Museum of Scotland 2, 3, 5, 7, 8, 14, 23, 27, 29, 30, 31, 33, 35, 37, 41, 42, 45, 47, 49, 67
Dynamic Earth 35 | Royal Botanic Garden Edinburgh 8, 23, 27 | Summerhall 41, 42, 67

Plan your journey at www.lothianbuses.co.uk or download your free app at TfEapp.com

*The Family DAYticket allows up to 2 adults and up to 3 children, aged 5-15 years old inclusive, unlimited travel together on Lothian day services and Edinburgh Trams (city fare zone only) for one day.

Not valid on Airlink, Skylink (to/from Airport), NightBus services, special services, outside the city zone on Lothiancountry and outside zones A & B on East Coast Buses. Standard Conditions of Carriage apply across all age groups.

ALSO ON TODAY



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| RECURRING EVENTS | |
| P.11 | ELEMENTAL 11AM-9PM SUMMERHALL |

OCEAN THREADS



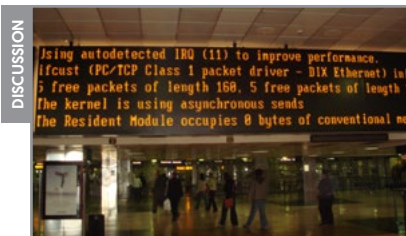
EDINBURGH COLLEGE OF ART | SCULPTURE COURT
11AM-5PM | DROP-IN
ON UNTIL SUN 19 APRIL (NOT SUN 12 APRIL)
FREE

This exhibition showcases a spectacular collection of costumes and design books by Performance Costume students from Edinburgh College of Art at The University of Edinburgh. Developed in response to Edinburgh Science's *Pale Blue Dot* project and made from 80% recycled materials, the designs are inspired by the creative ways that people are tackling environmental challenges facing the world's oceans and water systems. The costumes will also feature in a special performance at the launch of *Pale Blue Dot* in the Grand Gallery of the National Museum of Scotland on Saturday 4 April.

Presented by Edinburgh College of Art at The University of Edinburgh
Image: Elly White



COMPUTER SAYS OH NO!



NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
5.30PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

Software is running the world but why is it still crashing? A spreadsheet bug gave us austerity economics and an overlooked detail knocked out O2's 4G phone network. So what is it about software systems that leads to these kinds of failures? In this Sidney Michaelson lecture, chaired by **Prof Bill Buchanan**, author and software consultant **Kevlin Henney** explores failures in software, its application and how they affect us at different scales, from user to society.

Presented by BCS, The Chartered Institute for IT

EDINBURGH SKEPTICS: THE SCIENCE OF POLITICS



AGES 18+ | DISCUSSION

THE BANSHEE LABYRINTH
7.30PM | 1 HOUR
ALSO ON THU 9, TUE 14 AND THU 16 APRIL | **FREE**

Despite the dismissal of 'experts' by some of today's politicians, as skeptics we believe that governments at all levels should pursue evidence-based policies whenever possible. Enjoy four talks from 'experts' whose work has underscored, or perhaps should underscore, public policy and can help politicians make good choices in order to govern successfully. See our website for more details. Over 18s only.

Presented by Edinburgh Skeptics Society

LET'S TALK CANCER PREVENTION



DISCUSSION

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
8PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

Although the rate of cancer survival in the UK has doubled and half of patients now survive the disease for ten or more years, the number of people getting cancer is increasing. Although our understandings of the risks are constantly improving, preventing cancer remains a complex issue. Join Cancer Research UK's cancer prevention champion **Prof Linda Bauld** to explore the changes we can make as a society to stack the odds in our favour.

Presented by Cancer Research UK

7 APRIL



ALSO ON TODAY



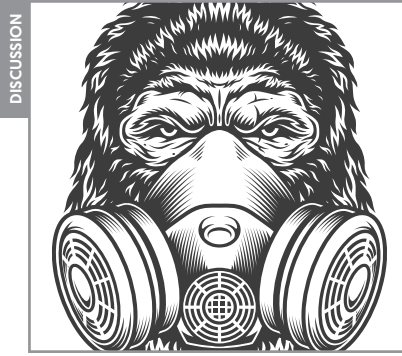
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| P.11 | SYNCRASY 11AM-6PM SUMMERHALL |

RECURRING EVENTS

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|------|---|
| P.11 | ELEMENTAL 11AM-9PM SUMMERHALL |
|------|---|

ADAPT OR DIE



NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
5.30PM | 90 MINS | **£9/£7/#SCIFIVE £5**

We are currently in the middle of a massive extinction event - the sixth that our planet has faced. The one million animals and plants that are globally at risk of disappearing altogether have a choice: adapt or die. Our panel, including the RSPB's **Dr Paul Walton**, The University of Edinburgh's **Dr Ally Phillimore** and Glasgow University's **Prof Pat Monaghan**, explore what an extinction event means for Earth's inhabitants and what role evolution might play...

EXPLORING SPACE SCIENCE



ROYAL OBSERVATORY EDINBURGH

LECTURE THEATRE

6PM | 2 HOURS | **FREE BOOKING REQUIRED**

Listen as the experts bring cutting-edge space science to life. Join **Prof Anu Ojha**, Director of the National Space Academy, **Prof Gillian Wright**, Director of the UK Astronomy Technology Centre and **Dr Pamela Anderson** from the European Space Agency, for an evening of engaging space science topics. Ranging from the big questions of exploration and understanding to the way space impacts on our day-to-day lives, these talks will transport you out of this world and back again.

Presented by National Space Academy and Royal Observatory Edinburgh

EXTREMELY PEDESTRIAN CHORALES



SUMMERHALL | MAIN HALL

7.30PM | 55 MINS | **£12/£10**

Enjoy the prosaic and commonplace experience of the pedestrian as an act of beauty, meaning and gentle comedy. Taking its form and structure from the sublime JS Bach's Chorales - *Extremely Pedestrian Chorales*, by **Karl Jay-Lewin** and **Matteo Fargion**, brings things back to the present day with just a dash of punk-ish irreverence and 18th century powder wigs. A beguiling mix of high and low art exploring the multifarious roles and movement languages of the pedestrian.

Presented by Agile Arts and Summerhall

LET ME BREATHE



NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

8PM | 90 MINS | **£9/£7/#SCIFIVE £5**

The simple act of breathing polluted air is killing millions of people every year and harming many more worldwide. Join our experts **Prof D K Arvind**, a computer scientist at The University of Edinburgh, **Prof Amita Baviskar**, a social scientist at the Institute of Economic Growth in Delhi and **Prof Nina Sabnani**, a designer and animator at the Indian Institute of Technology Bombay in Mumbai, to explore different experiences of asthmatic adolescents living in Delhi - one of the most polluted cities in the world. Witness the premiere of six stunning animations drawn by the children our experts worked with and monitor your personal exposure in central Edinburgh wearing one of our personal exposure sensors.

Presented by The University of Edinburgh

8

APRIL

ALSO ON TODAY



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RECURRING EVENTS

| | |
|------|---|
| P.11 | ELEMENTAL 11AM-9PM SUMMERHALL |
| P.15 | EDINBURGH SKEPTICS: THE SCIENCE OF POLITICS 7.30PM BANSHEE LABYRINTH |

BIG SEAWEED SEARCH: BECOME A CITIZEN SCIENTIST



AGES 16+ WORKSHOP

PORTOBELLO | JOPPA SANDS
MEET AT GRASS WEST OF ROCKVILLE HOTEL
10.30AM | 2 HOURS | **FREE BOOKING REQUIRED**

Get the skills and confidence to be a citizen scientist along our stunning coastlines! Led by the Marine Conservation Society, you'll spend a morning practising identification and survey skills in a friendly, supportive environment. Come along and learn about the incredible diversity of marine life we have along our coasts, why it's so important and what you can do to help protect it. *No prior knowledge necessary. Over 16s only. Please dress appropriately for this outdoor event including sensible footwear and waterproof clothing.*

Presented by Marine Conservation Society



SCIENCE BEHIND INTENSIVE CARE



DISCUSSION

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
5.30PM | 2 HOURS | **£9/£7/#SCIFIVE £5**

From the air we breathe to the water in our bodies - intensive care is where the scientific elements meet diagnosis, treatment and care for people when their lives are in danger. Come and be inspired by specialists from around the UK as they give an exciting insight into how science helps us to look after our patients.

Presented by the Intensive Care Society

THE TRUTH ABOUT VACCINES



DISCUSSION

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH
6PM | 90 MINS | **£3**

In 1998, a medical furore broke out when *The Lancet* published an article by Andrew Wakefield questioning the benefits of the MMR vaccination. Coming 202 years after the first smallpox vaccination by Edward Jenner, this incident is one of many concerning vaccinations and has helped fuel the rise of the anti-vaxxer movement. Join **Prof Gareth Williams**, University of Bristol, and **Dr Heidi Larson**, London School of Hygiene and Tropical Medicine, to examine the past, present and future of vaccination and alleviate public concerns around this hot topic.

Presented by the Royal College of Physicians of Edinburgh

WOMEN IN CONSERVATION



DISCUSSION

EDINBURGH ZOO
7PM | 90 MINS | **SUGGESTED DONATION £5**

Who runs the world? Get to know the fascinating leading ladies of conservation from Edinburgh Zoo. The leading female geneticists, veterinarians, keepers and biologists of the Royal Zoological Society of Scotland tell all about their experiences on the frontline of protecting species in Scotland and across the world.

Presented by Edinburgh Zoo

ENDURANCE WITH MARKUS STITZ



DISCUSSION

SUMMERHALL | RED LECTURE THEATRE
7PM | 2 HOURS | **£12/£10**

Edinburgh-based endurance athlete and author **Markus Stitz** has travelled over 34,000km around the world to 26 countries and across the mountains of Central Asia, Patagonia and Norway on a single speed bike. In 2017, he started Bikepacking Scotland, which promotes the exploration by bike of Scotland's vast network of mostly forgotten heritage paths, purpose built trails and cycle paths. Stitz shares stories from his latest adventures, including an unsupported, single-stage cycling race crossing the Moroccan Atlas.

Presented by Markus Stitz and Summerhall

THURSDAY
9
APRIL

EVENTS FOR ADULTS AND YOUNG PEOPLE

BOOKING HOTLINE: 0131 226 0005

ONLINE BOOKING: SCIENCEFESTIVAL.CO.UK

ALL FIRED UP

We are *All Fired Up* about the climate crisis and want to talk about it with you!

The Earth is burning – temperatures continue to rise, forest fires ravage the globe and we face a climate emergency that threatens the future of all life on Earth. The climate crisis requires us to change our carbon-guzzling ways and embrace the possibilities that a cleaner, greener future has to offer.

Join leading voices in this crucial conversation at our special climate and environment themed events and visit our special online *All Fired Up* portal to access exclusive teasers, tips and tricks before, during and after Festival events.

Be a part of the climate crisis conversation and see what Edinburgh Science is doing on p.38.

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
| P.9 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
| P.9 | GAIA AT DYNAMIC EARTH 10AM-4PM DYNAMIC EARTH |
| P.9 | THINK PLASTIC: MATERIALS & MAKING 10AM-5.45PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.9 | PARASITES: BATTLE FOR SURVIVAL 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.10 | PALE BLUE DOT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.10 | SCOTLAND'S PRECIOUS SEAS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.10 | JULIJONAS URBONAS: PLANET OF PEOPLE 10AM-5PM COLLECTIVE |
| P.10 | ENTANGLEMENTS OF TIME AND TIDE 10AM-6PM EDINBURGH PRINTMAKERS |
| P.15 | OCEAN THREADS 11AM-5PM EDINBURGH COLLEGE OF ART |
| P.11 | SYNCRASY 11AM-6PM SUMMERHALL |

RECURRING EVENTS

| | |
|------|--|
| P.11 | ELEMENTAL 11AM-6PM SUMMERHALL |
| P.12 | CINEHALL: ELEMENTAL 7PM SUMMERHALL |

| | |
|------|---|
| P.19 | CLIMATE SICKNESS 12.30PM 11 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.22 | SCOTLAND'S ENERGY QUADRILEMMA 5.30PM 13 APRIL PLEASANCE |
| P.25 | THE FOUR-DAY WEEK 8PM 14 APRIL PLEASANCE |
| P.27 | EDINBURGH MEDAL ADDRESS 7PM 15 APRIL CITY CHAMBERS |
| P.39 | CONSUME, DISCARD, REPEAT 12.30PM 19 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.41 | 10 CLIMATE COMMANDMENTS 8PM 19 APRIL PLEASANCE |

Search our website for more event suggestions.

- EdSciFest
- EdinburghScienceFestival
- EdSciFest

WILDCATS AND WHISKY

AGES 18+
DISCUSSION



HOLYROOD DISTILLERY

7PM | 2 HOURS | **£30**

Join us for a dram or two of Scotland's most iconic drink as we tell you the story of one of the country's most famous animals. Hear Edinburgh Zoo's wildcat expert discuss the history of wildcats in Scotland and reveal the exciting next chapter in the battle to save our last native cat species. This night out with a twist is full of feline fun that you won't want to miss. *Over 18s only.*

Presented by Edinburgh Zoo

EXPLORING THE FIVE DEEPS

DISCUSSION



DYNAMIC EARTH | BIOSPHERE

7PM | 2 HOURS | **£9/£7/#SCIFIVEES**

The deepest parts of the ocean are one of the final remaining frontiers of discovery left on our planet. Much of the deep ocean is unmapped and draws in explorers, scientists, cartographers and environmentalists, keen to discover its secrets. The Five Deeps Expedition was a venture conceived by explorer Victor Vescovo, which saw him reach the deepest point in each of the Earth's five oceans in his own purpose built, full ocean depth submersible in a series of expeditions in 2018/19. Join British Geological Survey's **Heather Stewart**, expert in marine geology, and **Dr Alan Jamieson**, world leader in the biological exploration of the deep ocean, to hear about the challenges of exploring the deepest seafloors and find out what they learnt.

Presented in partnership between Dynamic Earth and Edinburgh Science

EDINBURGH
10
APRIL

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
| P.9 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
| P.9 | GAIA AT DYNAMIC EARTH 10AM-4PM DYNAMIC EARTH |
| P.9 | THINK PLASTIC: MATERIALS & MAKING 10AM-5.45PM ROYAL BOTANIC GARDEN EDINBURGH |
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| P.15 | OCEAN THREADS 11AM-5PM EDINBURGH COLLEGE OF ART |
| P.11 | SYNCRASY 11AM-6PM SUMMERHALL |

RECURRING EVENTS

| | |
|------|--|
| P.11 | ELEMENTAL 11AM-6PM SUMMERHALL |
| P.13 | DOME NIGHTS 6PM DYNAMIC EARTH |
| P.12 | CINEHALL: ELEMENTAL 7PM SUMMERHALL |

THE CARBON WALK



ACTIVITY

HOLYROOD ROAD | MEET OUTSIDE DYNAMIC EARTH
11AM AND 2PM | 50 MINS | **FREE BOOKING REQUIRED**

Join artist and activist **Dr Romain Viguier** on a *Carbon Walk*. Beginning at Dynamic Earth, you'll collect a bag weighing 5kg, the equivalent of 3.5 hours of the average carbon footprint in the UK. Bags will be carried to the Edinburgh Centre for Carbon Innovation, where they will form part of a community art installation representing one tonne of carbon dioxide. Just like walking – we must take one step at a time to turn our carbon-based economy around. *Please dress appropriately for this outdoor event including sensible footwear and waterproof clothing.*

Presented by SCCS, The University of Edinburgh

CLIMATE SICKNESS



DISCUSSION

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
12.30PM | 90 MINS | **£9/£7/#SCIFIVE £5**

The climate emergency has consequences affecting more than just the weather. One of the many concerns is its impact on our physical and mental wellbeing, with many declaring that the climate emergency is a health emergency. What are the impacts of the changing climate on the health and wellbeing of people in the UK? Join **Prof Hilary Graham**, specialist in the relationship between climate and public health, and our panel of experts to discuss the implications of this crisis.

SWAY: UNRAVELLING UNCONSCIOUS BIAS



DISCUSSION

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
3PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

Behavioural scientist, activist and writer **Dr Pragya Agarwal** unravels the way unintentional biases affect the way we communicate and perceive the world and how they influence our decision-making even in life and death situations. Dr Agarwal combines case studies, personal experience, interviews and real-world stories underpinned by scientific theories and research to cover a range of biases including ageism, sexism and racism.

Presented by Bloomsbury

WOMEN IN



Jocelyn Bell Burnell



Patricia Bath



Marie Curie



Dian Fossey

Edinburgh Science Festival is proud to champion the achievements of women in science and science communication, and strive for a balanced representation of gender in our programming. We have made a dedicated effort over the past three years to increase the number of women participating in the Science Festival, securing over 40% female participants in the 2017, 2018 and 2019 editions of the Festival.

The Edinburgh Science Festival has always strived to promote, encourage and inspire the next generation of females into STEM fields by showing them the amazing women already in STEM via a series of panel events, workshops, exhibitions and discussions.

| | |
|------|--|
| P.11 | SYNCRASY 11AM-6PM 5 APRIL-28 JUNE SUMMERHALL |
| P.13 | SOME MUTE INGLORIOUS NEWTON 12.30PM 5 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.13 | ENERGISING ENGINEERING 5.30PM 5 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.17 | WOMEN IN CONSERVATION 7PM EDINBURGH ZOO |
| P.25 | EARTHLY MATTERS: A SPACE GYNAECOLOGIST'S PERSPECTIVE 7.30PM 14 APRIL PLEASANCE |
| P.40 | PERIOD POWER 6PM 19 APRIL PLEASANCE |

Search our website for more event suggestions.

11 APRIL

ALSO ON TODAY



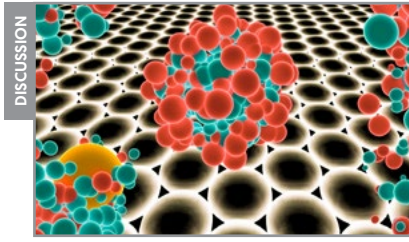
ONGOING EXHIBITIONS

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RECURRING EVENTS

| | |
|------|------------------------------------|
| P.13 | DOME NIGHTS 6PM DYNAMIC EARTH |
|------|------------------------------------|

NANO COMES TO LIFE



NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

3PM | 1 HOUR | £9/£7/#SCIFIVE £5

Join author and biological physicist **Prof Sonia Contera** to explore the rapidly evolving nanotechnologies that are allowing us to manipulate the very building blocks of life. As we contemplate the power, advantages, and risks of accessing and manipulating our own biology, Prof Contera offers insight and hope that we may all share in the benefits of this revolutionary research.

Presented by Princeton University Press

ALSO ON TODAY



ONGOING EXHIBITIONS

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RECURRING EVENTS

| | |
|------|------------------------------------|
| P.13 | DOME NIGHTS 6PM DYNAMIC EARTH |
|------|------------------------------------|



12

APRIL

13

APRIL

A SPACE FOR YOUNG ADULTS



Our Youth Consultation Group work each year in collaboration with Festival teams to bring young adult issues, interests and recommendations to the top of our to do list.

By working on ideas and making decisions that will help the Festival connect with young people, and assisting in the creative development of future Edinburgh Science Festival activities, the Youth Consultation Group is helping to shape the future of Edinburgh's STEM-inspired, cultural scene.

'We love coming up with new ideas and fresh perspectives to produce an inclusive and diverse programme of events that can inspire audiences our age'

Theory of the Imagined is the official Youth Consultation Group event for #EdSciFest2020

YCG RECOMMENDS TOP 5 EVENTS

P.26 A VERY SHORT INTRODUCTION TO... PSYCHOPATHY
1PM | 15 APRIL | PLEASANCE

The word 'psychopath' is thrown around to mean angry or wild, but it's a medical diagnosis, and we want to know what it actually means.

P.33 INTERACTIVE DIGITAL STORYTELLING | 2PM
17 APRIL | PLEASANCE

It's a new take on the classic 'Choose Your Own Adventure' genre.

P.64 TREE CLIMBING EXPERIENCE | 10AM
18 APRIL | ROYAL BOTANIC GARDENS

You climb trees less and less as you grow up, so it's an excuse to climb trees without being judged!

P.35 CREATE A VIRTUAL REALITY WORLD | 2PM
18 APRIL | PLEASANCE

There are endless possibilities for you to create a story, and make it whatever you want it to be.

P.36 QUEER BY NATURE | 6PM
18 APRIL | PLEASANCE

It's a look at a new side of nature that a lot of people wouldn't have thought about.

Search our website for more event suggestions.

THEORY OF THE IMAGINED



SPECIAL EVENT

NATIONAL MUSEUM OF SCOTLAND

HAWTHORNDEN COURT
10AM-5PM | DROP-IN | FREE

Why do we get attached to fictional characters? From *Harry Potter* to *The Avengers*, storytellers are able to manipulate our emotions with characters that never even existed. Through both drop-in activities with visitors and free, ticketed talk from industry specialists, the Festival's Youth Consultation Group explore the psychology of this phenomenon. See our website for details and to book your ticket for the industry discussion. Recommended for ages 12-18 but all ages welcome.

CYBER ZONE



WORKSHOP

PLEASANCE

Discovering the digital world has never been so cool. We're introducing our very first, immersive *Cyber Zone* packed with events covering technology, computing, programming and artificial intelligence (AI) for young people and grown ups too.



P.57 ELECTRONIC MUSIC: BEGINNERS
11AM AND 2PM | 13 APRIL

P.57 GADGET FACTORY
10AM, 11.30AM, 1.30PM AND 3PM | 13-14 APRIL

P.21 HACK YOUR OWN SELF-DRIVING CAR
11AM AND 2PM | 13-14 APRIL

P.59 ELECTRONIC MUSIC: INTERMEDIATE
11AM | 14 APRIL

P.25 ENTER THE MULTIVERSE: CRAFTING IMMERSIVE
STORIES IN VR | 6PM | 14 APRIL

P.26 APP FACTORY
11AM AND 2PM | 15-19 APRIL

P.26 ARTIFICIAL INTELLIGENCE
11AM AND 2PM | 15-19 APRIL

P.27 APP FACTORY FOR GROWN UPS (18+)
6PM | 15-16 APRIL

P.27 ARTIFICIAL INTELLIGENCE FOR GROWN UPS (18+)
6PM | 15-16 APRIL

P.33 INTERACTIVE DIGITAL STORYTELLING
2PM | 17 APRIL

P.33 INTERACTIVE DIGITAL STORYTELLING FOR GROWN
UPS (18+) | 6PM | 17 APRIL

P.35 CREATE A VIRTUAL REALITY WORLD
2PM | 18 APRIL

P.36 CREATE A VIRTUAL REALITY WORLD FOR GROWN
UPS (18+) | 6PM | 18 APRIL

P.35 CODING FOR GROWN UPS (18+)
2PM AND 6PM | 18-19 APRIL

CYBER ZONE

HACK YOUR OWN SELF-DRIVING CAR



WORKSHOP

PLEASANCE | HIGHLAND ROOM

11AM AND 2PM | 90 MINS | ALSO ON TUE 14 APRIL | £16

Give Elon Musk a run for his money and create your own programmable self-driving car! Build your model using a radio-controlled car, a Raspberry Pi and a distance sensor then program the car using Python scripts before letting it loose on the floor.

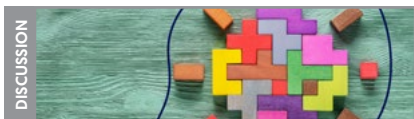
Presented by STMicroelectronics (R&D) Ltd

Supported by



**DIGITAL WORLD
SHAPE IT**

A VERY SHORT INTRODUCTION TO... INTELLIGENCE



DISCUSSION

PLEASANCE | CABARET BAR
1PM | 1 HOUR | **£7/#SCIFIVE £5**

Join distinguished human intelligence researcher and author **Prof Ian Deary** to learn the basics about IQ. This intelligence deep-dive covers topics such as whether intelligence differences are caused by genes or the environment and whether intelligence declines or increases as we grow older. You'll be a member of Mensa in no time!

Presented by Oxford University Press

DIGGING DEEP



DISCUSSION

PLEASANCE | LOMOND ROOM
5.30PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

Our increasing need for metals is driving some people to the deep sea for solutions. But how much do we know about the impacts that this might have on these poorly understood and often delicate habitats? Our panel of speakers, including expert in deep sea mining **Amber Cobley**, take a look at the consequences of drilling in the deep.



SCOTLAND'S ENERGY QUADRILEMMA



DISCUSSION

PLEASANCE | UPPER HALL
5.30PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

In 2019, Scotland committed to reducing carbon emissions by 75% before 2030 and becoming a carbon-neutral society by 2045. Examining the 'energy quadrilemma' – energy security, affordability, sustainability and public acceptability – we speak to policy and energy experts, including **Prof Lesley Yellowlees**, chemist and solar energy researcher, and geothermal energy entrepreneur **David Townsend**, to discuss problems and solutions.

Supported by

IOP Institute of Physics
Scotland

5G: WHAT'S IN IT FOR ME?



DISCUSSION

PLEASANCE | CABARET BAR
6PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

The 5G network has been switched on in Edinburgh making us one of six UK test cities. There's faster internet and a better connection but not everybody's happy about it. We have lived through four generations of wireless internet without a fuss so what's so different about the rollout of 5G? Headlines are picking up concerns about effects on health but is there anything behind this? Where is this (mis) information coming from? Join host **Craig Steele**, director of Digital Skills Education, in conversation, to attempt to sort 5G fact from 5G fiction and ask what this revolution means?

Supported by

**JAMES CLERK
MAXWELL
FOUNDATION**

FIRE POWER



DISCUSSION

PLEASANCE | PLEASANCE THEATRE
6PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

The ability to harness fire helped shape humanity. It revolutionised economies, transformed how we live and transported us to the edges of the solar system. But every year fire kills thousands of people, destroys millions of acres of forests and the emissions from the burning of fossil fuels are exacerbating climate change. In this discussion, **Dr Rory Hadden** explores the science of fire to shed light on what we do and don't know about fire.

Presented by The University of Edinburgh

GET WASTED



AGES 18+

DISCUSSION

PLEASANCE | LOMOND ROOM
7.30PM | 90 MINS | **£9/£7/#SCIFIVE £5**

When we throw away rubbish or ditch our recycling, we put it out of sight and out of mind. But what really happens after the bin lid shuts? Who are the heroes trying to make our waste useful again? Come and sample a circular economy beer while our rubbish panel answer your questions! *Over 18s only.*

STRANGER THAN FICTION: PANEL GAME

SPECIAL EVENT



PLEASANCE | UPPER HALL

7.30PM | 1 HOUR | £9/£7/#SCIFIVE £5

A panel game with a difference – the panel vs you! The Festival's most popular lie-busting show is back with an elementary theme as a motley team of non-fiction writers will try to pull the wool over your eyes by sneaking some surprising facts hidden amongst ridiculous fiction and persistent science myth. Each round has a different flavour ranging from short themed talks to quickfire truth-or-fiction. Get ready to make some noise.

Presented by Stranger Than Fiction

INDECENT INSECTS

AGES 18+
DISCUSSION



PLEASANCE | CABARET BAR

8PM | 1 HOUR | £9/£7/#SCIFIVE £5

They lie, steal, kiss and sing. They offer gifts, create mind-altering chemical cocktails and, sometimes, explode and chew off their genitals – all to secure the next generation. We bet you didn't know how diverse insects' sex lives can be! Naturalist and author **Jules Howard** is joined by world fly expert **Dr Erica McAlister** to fill you in on all the latest discoveries in insect sex science in their trademark light-hearted style.

WHAT IS OUT THERE?

DISCUSSION



PLEASANCE | PLEASANCE THEATRE

8PM | 90 MINS | £9/£7/#SCIFIVE £5

Is it arrogant to assume that the only life in the Universe exists here on Earth? We're eager to search for life outside of our little blue marble and our experts are doing just that. Join **Dr Rosa Santomartino**, microbial astrobiologist, **Dr Beth Biller**, specialist in exoplanet imaging and characterisation, and **Prof Charles Cockell**, founder of the UK Centre for Astrobiology, to explore the questions surrounding our hunt for extraterrestrial life. Perhaps we've been alone all along...or have we?

SCI FIVE

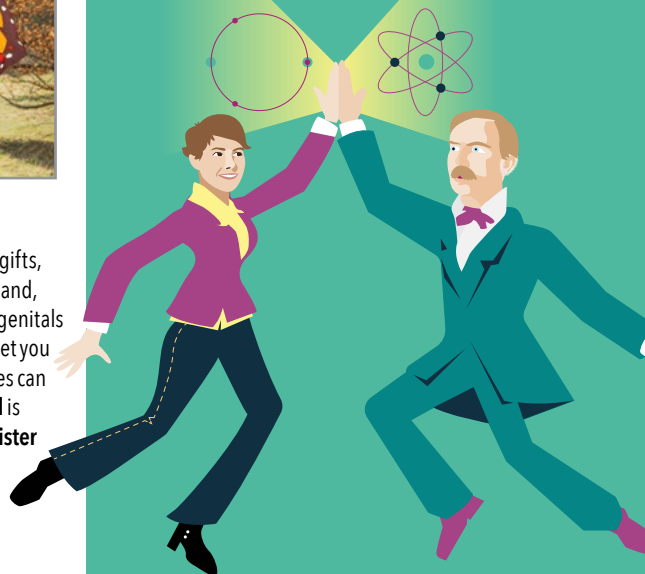


FIG 1. SCIPALS HELEN QUINN AND ERNEST RUTHERFORD DEMONSTRATE A SUCCESSFUL #SCIFIVE!

TEACHERS AND STUDENTS £5 TICKETS!

Are you sci-curious? Students and teachers can explore everything from engaging workshops and discussions to a great night out - with tickets for just £5 at most Science Festival events.

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.

EdSciFest

EdinburghScienceFestival

EdSciFest

| | |
|------|---|
| P.11 | WHERE IS YOUR NEXT MEAL COMING FROM? 12.30PM 4 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.18 | EXPLORING THE FIVE DEEPS 7PM 10 APRIL DYNAMIC EARTH |
| P.22 | A VERY SHORT INTRODUCTION TO... INTELLIGENCE 1PM 13 APRIL PLEASANCE |
| P.25 | ISLANDS OF LOVE: THE SCIENCE OF REALITY ROMANCE 8PM 14 APRIL PLEASANCE |
| P.31 | ELEMENT SIX 8PM 16 APRIL PLEASANCE |
| P.40 | STRANGE ICE WITH ANDREA SELLA 3PM 19 APRIL NATIONAL MUSEUM OF SCOTLAND |

Search our website for more event suggestions.

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------------------|--|
| P.9 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
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| P.11 | SYNCRASITY 11AM-6PM SUMMERHALL |
| RECURRING EVENTS | |
| P.21 | HACK YOUR OWN SELF DRIVING CAR 11AM AND 2PM PLEASANCE |
| P.15 | EDINBURGH SKEPTICS: THE SCIENCE OF POLITICS 7.30PM BANSHEE LABYRINTH |

A VERY SHORT
INTRODUCTION TO...
EVOLUTION

PLEASANCE | CABARET BAR
1PM | 1 HOUR | **£7/#SCIFIVE £5**

In this very short introduction, evolution experts **Profs Brian and Deborah Charlesworth** provide a clear and concise summary of the process of evolution by natural selection and how this gives rise to adaptations and eventually, over many generations, to new species. They introduce the central concepts of the field of evolutionary biology, as they have developed since Darwin and Wallace on the subject, over 140 years ago, and the importance of an evolutionary understanding of combating the rapid evolution of resistance by bacteria to antibiotics and antiviral drugs.

Presented by Oxford University Press

FROM LIVING PLANTS
TO FOSSILS

ROYAL BOTANIC GARDEN EDINBURGH

JOHN HOPE GATEWAY

2PM | 90 MINS | ALSO ON THU 16 AND SAT 18 APRIL | **£5**

What do fossil plants tell us about the evolution of different plant types? Join botanist **Dr Heather McHaffie** for a walk through the gardens, exploring modern plant species and their links with fossilised plant remains from the geological past. *Please dress appropriately for this outdoor event including sensible footwear and waterproof clothing.*

Presented by Royal Botanic Garden Edinburgh and Edinburgh Geological Society

ROADS RE-IMAGINED



PLEASANCE | UPPER HALL

5.30PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

What would Edinburgh city centre look like if you could design it? With rising congestion in towns and cities worldwide, and the declaration of air pollution as a public health emergency by the World Health Organisation, is it time to ask the question - should cars be part of our future? Join our panel from Edinburgh Council, Jacobs and Living Streets to unpack the issues of creating more cycle and pedestrian friendly spaces and reducing traffic to create friendlier and healthier cities of the future. Hosted by environment and transport journalist, **Laura Laker**.

HOW HUMANS ARE
ALTERING LIFE ON EARTH

PLEASANCE | LOMOND ROOM

5.30PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

Through climate change, humans have affected even the most remote environments and their inhabitants, and studies suggest that through our actions we are forcing some animals to evolve at breakneck speed to survive. Whilst some are thriving, others are close to dying out. **Dr Helen Pilcher** considers the many ways that we've shaped the DNA of the animal kingdom and how we might use what we know to save species from the brink of extinction.

Presented by Bloomsbury

PARASITES: DESIGNING
AN EXHIBITION ABOUT
SCIENTIFIC RESEARCH

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

5.30PM | 90 MINS | **£7/£6/£5 STUDENTS**

The *Parasites: Battle for Survival* exhibition highlights current research tackling five tropical parasitic diseases which affect millions of people across the globe. Exhibition curator **Sophie Goggins** chairs a panel discussion with the researchers involved in the creation of the exhibition, to explore the role exhibitions play in making complex research accessible to a public audience. *The exhibition is presented in partnership with the University of Dundee, The University of Edinburgh and the University of Glasgow.*

Presented by National Museums Scotland

Image: Neil Hanna

ADDICTED TO GAMES



PLEASANCE | CABARET BAR

6PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

South Korea has banned children under 16 from using online games between midnight and 6am. In China, gamers under 18 are banned from playing online between 10pm-8am. They will also soon be restricted to 90 minutes of gaming on weekdays and three hours on weekends and holidays. So why the restrictions? As of 2018, Gaming disorder is recognised by the World Health Organisation's International Classification of Diseases. **Craig Steele**, director of Digital Skills Education, hosts a conversation with **Dr Mark Griffiths**, distinguished professor of Behavioural Addiction, to consider what gaming addiction is, how it affects people and challenge some of the common misconceptions about gamers and unhealthy gaming behaviour.

14
APRIL

THIS IS AN EMERGENCY

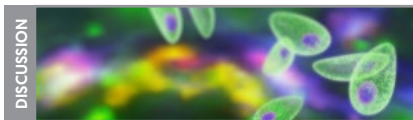


DISCUSSION

PLEASANCE | PLEASANCE THEATRE
6PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

Global warming is an 'emergency' not a 'crisis'. But what does it mean if we don't get off our current path towards global warming? Will the UK burn or freeze? Will we be inundated by people displaced by the effects of climate change? **Dr Kate Crowley**, climate scientist, shares with us the expected changes as the planet warms and **Elizabeth Bomberg**, professor of environmental politics, considers the geopolitical fallout from these fast moving climatic changes. With speakers from The University of Edinburgh, this event is chaired by **Dr Simon Gage**, Director of Edinburgh Science.

PARASITES: FRIEND OR FOE?



DISCUSSION

ROYAL BOTANIC GARDEN EDINBURGH
LECTURE THEATRE
6PM | 1 HOUR | **£5**

Our changing climate and an increase in travel to remote areas of the world has increased our encounters with a wide range of different parasites. **Prof Lee Innes** of the Moredun Research Institute will discuss the fascinating relationship we have with the many parasites that live inside us and why some of these parasites can be deadly and some may actually be beneficial to us. *This event is linked to the One Health activity.*

Presented by Royal Botanic Garden Edinburgh



WORKSHOP

PLEASANCE | OCHIL ROOM
6PM | 2 HOURS | **£12/£10**

Great stories are at the heart of science and as technology continues to advance the science storyteller has an ever-increasing wealth of tools at their disposal. Through gamified prototyping, this speculative digital design workshop explores how immersive worldbuilding can be used to imagine, prototype and build possible futures, combining science and technology to craft amazing stories in virtual reality. Join artists, filmmakers and digital explorers **María Laura Ruggiero** and **Ana Fraile** as they reveal the transformative spirit of spatial narratives and build stories out of pixels.

Presented by SEIRENFILMS and PULPO FILMS
in association with Edinburgh Science

ELEMENTS OF MEDICINE: FROM AETHER TO ETHER



DISCUSSION

PLEASANCE | LOMOND ROOM
7.30PM | 90 MINS | **£9/£7/#SCIFIVE £5**

How has medicine changed over the past millennium? From Galen's four humours to the rise of Newtonian medicine during the Enlightenment, **Dr Petros Bouras-Vallianatos**, **Dr Natalie Goodison** and **Dr Xiaona Wang** examine the forgotten histories of drugs, surgery, therapeutics, childbirth and gynaecology. This panel of experts will provide an insight into the shifting influences and inspirations that eventually became the fundamental elements of modern medicine.

Presented by The University of Edinburgh

EARTHLY MATTERS: A SPACE GYNAECOLOGIST'S PERSPECTIVE



DISCUSSION

PLEASANCE | UPPER HALL
7.30PM | 90 MINS | **£9/£7/#SCIFIVE £5**

For the past decade, **Dr Varsha Jain** has been fascinated by the impact space has on human health. Her research today offers valuable insight into women's health here on Earth. Join Dr Jain, in conversation with science communicator **Hazel Lambert**, for a lively and fun discussion about her findings and how she views the 'missing element' in our debate about women's Earthly matters.

Presented by The University of Edinburgh

PIZZABLOCK



WORKSHOP

PLEASANCE | PENTLAND ROOM
7.30PM | 2 HOURS | **£12**

Come and play *PizzaBlock!* A bespoke, hands-on game developed to introduce and explore the future of decentralised identity based on blockchain technologies. Your mission is to improve Edinburgh's pizza scene – however, to complete the necessary tasks, you must rely on a distributed ledger using a series of stickers, stamps, wallets and washing lines that make up a one-of-a-kind analogue blockchain technology. *Over 18s only.*

Presented by Design Informatics at The University of Edinburgh

ISLANDS OF LOVE: THE SCIENCE OF REALITY ROMANCE



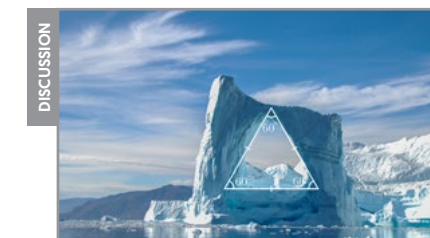
AGES 16+

DISCUSSION

PLEASANCE | PLEASANCE THEATRE
8PM | 90 MINS | **£9/£7/#SCIFIVE £5**

Don't be muggy, come along and dissect an absolute bev of a brain and uncover the personalities that are most likely to couple up – especially if it's all seen on TV. **Dr Raj Persaud** explores the scientific theory behind our favourite summer lovefest. What kind of personality type is best for you and do they ever end up on a TV programme like Love Island? How can you improve your ability to spot different personality types? Come along and take part in our fun science experiment where you judge each character and we'll tell you if you were right.

MATHS OF CLIMATE CHANGE



DISCUSSION

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
8PM | 90 MINS | **£9/£7/#SCIFIVE £5**

Award-winning lecturer **Prof Geoffrey Vallis** presents the *Maths of Climate Change* followed by a conversation with comedian **Susan Morrison**. Global warming is one of the most important challenges facing society, yet sometimes it seems mired in controversy. Is it really happening? Why is it happening? In fact the physical laws governing climate change are well understood and with just a bit of maths we can figure out what is likely to happen in the future.

Presented by International Centre for Mathematical Sciences

THE FOUR-DAY WEEK



DISCUSSION

PLEASANCE | CABARET BAR
8PM | 90 MINS | **£9/£7/#SCIFIVE £5**

Some argue that the five-day working week is a relic of days gone by. We investigate the impact of modern-day working patterns on our mental health and the role they play in the climate crisis with occupational psychologist **Dr Roxane Gervais** and chartered environmentalist **Tom Bailey**. What benefits could we see for us and the planet by changing what the typical working week looks like? Hosted by journalist **Lesley Riddoch**.

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|---|
| P.9 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
| P.9 | GAIA AT DYNAMIC EARTH 10AM-4PM DYNAMIC EARTH |
| P.9 | THINK PLASTIC: MATERIALS & MAKING 10AM-5.45PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.9 | PARASITES: BATTLE FOR SURVIVAL 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.10 | PALE BLUE DOT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.10 | SCOTLAND'S PRECIOUS SEAS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.10 | JULIJONAS URBONAS: PLANET OF PEOPLE 10AM-5PM COLLECTIVE |
| P.10 | ENTANGLEMENTS OF TIME AND TIDE 10AM-6PM EDINBURGH PRINTMAKERS |
| P.15 | OCEAN THREADS 11AM-5PM EDINBURGH COLLEGE OF ART |
| P.11 | SYNCRASY 11AM-6PM SUMMERHALL |

A VERY SHORT INTRODUCTION TO... PSYCHOPATHY



PLEASANCE | CABARET BAR

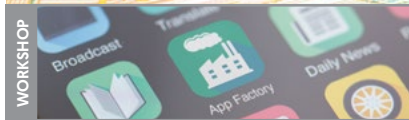
1PM | 1 HOUR | £7/#SCIFIVE £5

Despite the fascination with psychopaths in film, TV and novels, psychopathy remains widely misunderstood. Most psychopaths are not murderers; most violent criminals are not psychopaths. Separating myth from fact, professor of developmental psychology from the University College London, **Essi Viding** explores how we identify psychopaths, why they behave and develop the way they do, and whether treatment is possible.

Presented by Oxford University Press



APP FACTORY



PLEASANCE | HIGHLAND ROOM

2PM ON WED, THU AND SUN | 11AM ON FRI-SUN

90 MINS | ON UNTIL SUN 19 APRIL | £16

Come and create a new app for your Android phone. Discover the principles behind successful software development and put them into practice as you design, code and deploy a smartphone app. You'll be able to install your app on your phone and save the source code so you can keep working after the workshop. *No previous experience is needed for this but an interest in coding is recommended. See p.27 for App Factory for Grown Ups.*



ARTIFICIAL INTELLIGENCE



PLEASANCE | OCHIL ROOM

2PM ON WED-FRI | 11AM ON FRI-SUN | 90 MINS

ON UNTIL SUN 19 APRIL | £16

Unlock the secrets of artificial intelligence and discover what makes a machine learn. Learn what artificial intelligence is, what it's capable of and the underlying mechanisms of code and algorithms that make them work in this hands-on, interactive workshop. *See p.27 for Artificial Intelligence for Grown Ups.*

ARTHUR'S SEAT: EDINBURGH'S VOLCANO

AGES 14+
ACTIVITY

DYNAMIC EARTH | CLASSROOMS AND HOLYROOD

PARK | 2PM | 3 HOURS

ALSO ON FRI 17 AND SUN 19 APRIL | £8/£5

Lava will flow and sparks will fly as you join Edinburgh's resident volcano expert, **Angus Miller** of Geowalks, on an outdoor adventure in Holyrood Park. Explore the volcanic eruptions that rocked Edinburgh and helped form the city's landscape we see today, guided through the undulating geological past of Holyrood Park. A short indoor workshop will be followed by a guided excursion. *Please dress appropriately for this outdoor event including sensible footwear and waterproof clothing.*

Presented by Dynamic Earth

INTERSTELLAR MEDICINE



DISCUSSION

PLEASANCE | UPPER HALL

5.30PM | 1 HOUR | £9/£7/#SCIFIVE £5

CPR in space is pretty hard given the lack of gravity and hooking someone up to IV fluids won't be nearly as easy as it is on Earth. If we're going to survive long-term space travel, or even terraforming other planets, we'll need to adapt our current medical practices to work out there in the void. **Dr Christina Mackaill**, pioneer of CPR protocols in space, and **Dr Daniel Grant**, expert in extreme environment medicine, discuss how we're doing things now and how this might need to change in the future.

THE REPLICATION CRISIS



DISCUSSION

PLEASANCE | LOMOND ROOM

5.30PM | 1 HOUR | £9/£7/#SCIFIVE £5

Science needs defending against its doubters more than ever before. But there's a science secret that the public don't know: a lot of what you read in scientific journals probably shouldn't be believed. This discovery is known as the replication crisis, probably the most important thing to happen in the biomedical and social sciences this century. Behavioural scientist **Prof Daniel Nettle** takes us on a personal tour through the replication crisis and its effect on his life.

15

APRIL

THE CUTTING EDGE OF HEALTHCARE



NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

5.30PM | 1 HOUR | £9/£7/#SCIFIVE £5

Scotland has a rich history of innovators and visionaries and has long been at the forefront of scientific exploration and discovery. We speak to eminent medical scientist **Prof Dame Anna Dominiczak** about her work in precision medicine, cardiovascular science and beyond, investigating the landscape of present-day healthcare research.

LEVEL UP HUMAN



PLEASANCE | CABARET BAR

6PM | 1 HOUR | £9/£7/#SCIFIVE £5

Take a shot at redesigning humans and pitch your ideas to the experts. *Level Up Human* is a science comedy podcast panel show recorded in front of a live audience, that's you! Hosted by science communicator **Simon Watt**, with comedian **Rachel Wheeley** and a selection of expert scientists to discover what the future holds for humanity as they try and build a better human.



PLEASANCE | HIGHLAND ROOM

6PM | 90 MINS | ALSO ON THU 16 APRIL | £16

For the first time ever, we're opening up our *App Factory* to adults! Discover the principles behind successful software development as you design, code and deploy your own Android app. Install it on your phone and save the source code so you can keep working after the workshop. *No previous experience is needed but an interest in coding is recommended. Over 18s only. See p.26 for App Factory for ages 12-17.*



PLEASANCE | OCHIL ROOM

6PM | 90 MINS | ALSO ON THU 16 APRIL | £16

Unlock the secrets of artificial intelligence and discover what makes a machine learn in this adults only event. Learn what artificial intelligence is, what it's capable of and the underlying mechanisms of code and algorithms that make them work in this hands-on, interactive workshop. *Over 18s only. See p.26 for Artificial Intelligence for ages 12-17.*

RSE AFTER HOURS



THE ROYAL SOCIETY OF EDINBURGH

6PM | 3 HOURS | £7.50/£5

Enjoy an evening of inspiring conversations and demonstrations; all themed around artificial intelligence and its impact on society. Join philosopher of technology **Dr Shannon Vallor**, robotics expert **Prof Sethu Vijayakumar** and entrepreneur **Chris van der Kuyl** for drop-in discussions, short talks and activities showcasing the latest research and cutting-edge developments. A relaxed, informal but deeply inspiring event which connects the public to people from different scientific and creative art disciplines. *Over 18s only.* Presented by The Royal Society of Edinburgh

EDINBURGH MEDAL ADDRESS



CITY CHAMBERS | COUNCIL CHAMBER

7PM | 1 HOUR | £12/£10

Climate change, it would seem, could not happen at a worse time in human history. Every year is hotter than the next and it's getting worse. From forest fires, to increasing frequency and intensity of storms, to blistering cold waves and spiralling heat. But we are so distracted – from trade wars, to Brexit, to immigration, to economic crisis and skirmishes that are raging across our countries – that climate change is not a priority.

But it must be. Climate change is real; it is happening and it's making the poor in our world more marginalised. In an increasingly unequitable and climate-risked world, poor people – however resilient – cannot cope anymore. They have no option but to migrate from villages to cities and new countries. This will make the already volatile politics of immigration even more nasty and will feed insecurity, not just of the poor but also of the rich.

Our 2020 Edinburgh Medal recipient is **Sunita Narain**, the Indian environmentalist and political activist. As a member of the Prime Minister's Council for Climate Change between 2007 and 2014, she played a major role in Indian and global environment and development policy formulation. She is currently Director General of the Centre for Science and Environment (CSE). Join Narain to discuss what must be done in our world – to make it less insecure; less angry and less carbon risked. Remember, climate change, like air pollution is a great equaliser. So, what can we do? Our existence is at stake. Nothing less.



PREVIOUS RECIPIENTS

- 2019 Christiana Figueres
- 2018 Prof Cordelia Fine
- 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 Levens
- 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

Supported by  **ARTEMIS**
The PROFIT Hunter

SUPERFAN PRESENTS:
LIKE ANIMALS



SHOW
SUMMERHALL | OLD LAB

7.30PM | 1 HOUR | £12/£10

Returning to Summerhall after a successful Fringe 2019 run, *Like Animals* investigates love and communication in human (and not so human) relationships. The show explores a series of complex relationships, each with its own uniquely funny, strange and touching world, offering a new theatrical perspective on some intriguing scientific, ethical and philosophical questions, with a light touch and sense of fun and humour.

Presented by Superfan and Summerhall

THE SCIENCE OF POETRY



DISCUSSION
PLEASANCE | PENTLAND ROOM

7.30PM | 1 HOUR | £9/£7/#SCIFIVE £5

Find your inner poet and discover how you can help raise awareness of the biggest global environmental challenges. Join **Prof Patrick Corbett** from Heriot-Watt University and Scottish poet **Dr Colin Will** for a discussion on the use of poetry in science communication with a focus on the Earth sciences. You'll have the opportunity to test your poetic skills through writing your own poem which geological specimens, from the British Geological Society, will provide inspiration for.

Presented by Heriot-Watt University

ELEMENTAL VOICES



SHOW
SCOTTISH STORYTELLING CENTRE

NETHERBOW THEATRE

7.30PM | 1 HOUR 45 MINS | £10/£8

Ever thought you heard a voice in the sparking fire or in the song of a stream? Ever felt like the wind was talking to you or the earth was humming a soft lullaby? Let storytellers **Beverley Casebow** and **Virginia Bjertnes** take you on a journey of stories from the elements and rediscover ancient forgotten wisdom from our lovely planet.

Presented by Scottish Storytelling Centre

JUKEBOX BINGO: SCIENCE UP YOUR LIFE



SHOW
PLEASANCE | PLEASANCE THEATRE

8PM | 90 MINS | £9/£7/#SCIFIVE £5

Lay down your labcoats, dust off your party threads and take a firm hold of your dobbers as the Festival gets glittery with a special science-flavoured edition of Edinburgh's musical quiz sensation. *Jukebox Bingo* is a 2020 twist on the beloved pastime of the nation, testing your recall of scientifically-inspired chart classics from across the decades. Match the tracks on the decks to the artists on your bingo card to win some truly questionable prizes. Featuring sideshow shenanigans aplenty, this is a night out not to be missed.

Presented by Hexagon Productions

SCOTTISH FAMELAB FINAL



SPECIAL EVENT
PLEASANCE | CABARET BAR

8PM | 90 MINS | £9/£7/#SCIFIVE £5

Fascinating subjects and mind-blowing research presented live on stage in bite size, three-minute talks – this is science geekery galore! Fighting for a coveted spot in the FameLab Science Communication Competition Final, Scottish finalists will break down complex science in a unique and entertaining way. Hosted by **Jamie Gallagher** and judged on content, clarity and charisma, expect a science showdown of unseen magnitude.

Presented by Cheltenham Festivals in association with Edinburgh Science

WILDFIRE: RESISTANCE THROUGH ARCHITECTURE



DISCUSSION
NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

8PM | 90 MINS | £9/£7/#SCIFIVE £5

Design scientist **Dr Melissa Sterry** takes a look at the potential for urban resilience to wildfires through the creation of complex adaptive architectural systems. By mimicking the biochemistries, behaviours and relationships of fire-adapted flora and fauna species, our society could create towns and cities that cycle in symbiosis with wildfire in its varied forms. Joining journalist **Kate Ravilious**, Sterry considers the urgent need to reconsider the challenge of living with wildfire as a vital landscape process.

CELLULOID



SHOW
PLEASANCE | LOMOND ROOM

8.30PM | 45 MINS | £9/£7/#SCIFIVE £5

An illuminated storytelling performance exploring the illusion of cinema and the materials that sustain it, *Celluloid* is written and performed by **Annie Lord** with photochemical film and analogue projection by artist **Lydia Beilby**. Revealing the stories of the workers and patrons of Edinburgh's cinemas in the first half of the 20th century, *Celluloid* considers belief, imagination and the human desire to leave a mark on the world.

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
| P.9 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
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| P.15 | OCEAN THREADS 11AM-5PM EDINBURGH COLLEGE OF ART |
| P.11 | SYNCRASITY 11AM-6PM SUMMERHALL |

RECURRING EVENTS

| | |
|------|---|
| P.26 | APP FACTORY 2PM PLEASANCE |
| P.26 | ARTIFICIAL INTELLIGENCE 2PM PLEASANCE |
| P.24 | FROM LIVING PLANTS TO FOSSILS 2PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.27 | APP FACTORY FOR GROWN UPS 6PM PLEASANCE |
| P.27 | ARTIFICIAL INTELLIGENCE FOR GROWN UPS 6PM PLEASANCE |
| P.13 | DOME NIGHTS 6PM DYNAMIC EARTH |
| P.15 | EDINBURGH SKEPTICS: THE SCIENCE OF POLITICS 7.30PM BANSHEE LABYRINTH |

NATURAL SCIENCES COLLECTION TOUR



TOUR

NATIONAL MUSEUMS COLLECTION CENTRE

10.30AM | 75 MINS | **£10/£8/£6 STUDENTS**

From minuscule insects to mighty whales, the National Museums' Natural Sciences collection documents the incredible diversity of life on Earth. As part of Scotland's Year of Coasts and Waters, join curators to tour selected highlights of this remarkable collection.

Presented by National Museums Scotland

A VERY SHORT INTRODUCTION TO... RENEWABLE ENERGY



DISCUSSION

PLEASANCE | CABARET BAR

1PM | 1 HOUR | **£7/#SCIFIVE £5**

If you know the names of renewable energy alternatives but not much more, fear not! University of Oxford's **Emeritus Prof Nick Jelley** is here to fill in any gaps. Offering clear explanations of technologies, including recent innovations in wind and solar energy production, battery storage and in the emerging power-to-gas provision for clean heating, Jelley's renewable energy breakdown for beginners will give you the tools to make sustainable energy choices.

Presented by Oxford University Press

FOUND AND WOVEN



WORKSHOP

ROYAL BOTANIC GARDEN EDINBURGH

PATRICK GEDDES ROOM

2PM | 2 HOURS 30 MINS | **FREE BOOKING REQUIRED**

RP RELAXED PERFORMANCE

Our throwaway culture provides us with interesting materials with which to be creative. Using textile and weaving techniques, artist **Fiona Hutchison** will explore found, pre-loved or recycled materials in a workshop to create small works of art inspired by the sea. A creative reminder that materials are precious and deserve reuse! *This event is linked to the exhibition Think Plastic: Materials and Making and is designed to be a relaxed session.*

Presented by Royal Botanic Garden Edinburgh

ARE WE REALLY ALONE?



DISCUSSION

PLEASANCE | UPPER HALL

5.30PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

In 1974, a message was beamed towards the stars by the giant Arecibo telescope, a brief blast of radio waves designed to alert extraterrestrial civilisations to our existence. Of course, we don't know if such civilisations really exist. *The Contact Paradox* author **Keith Cooper** looks at how far the search for extraterrestrial intelligence has come since its modest beginnings and where it is going.

Presented by Bloomsbury

DISASTER BY CHOICE



DISCUSSION

PLEASANCE | LOMOND ROOM

5.30PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

In conversation with science journalist **Kate Ravilious**, author and professor of disasters and health **Ilan Kelman** offers an uncomfortable truth - that the majority of 'natural disasters' are created or exacerbated by human choices. Considering the social, political, and economic factors involved in our decision making around natural hazards, Kelman encourages us not to accept the complacent narrative of human helplessness in the face of the power of inevitable natural occurrences.

Presented by Oxford University Press

HOW THE ELEMENTS WERE NAMED



DISCUSSION

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

5.30PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

Join **Dr Peter Wothers**, University of Cambridge, to celebrate the elements in all their glory. You'll no longer need to question the influence that elements have had because Wothers provides the answers. Hear the remarkable stories behind the origins of the elements and better understand their names and historical context.

Presented by Oxford University Press

THE HUBBERS DAY
16
APRIL

FROM MENDEL TO MONSANTO



DISCUSSION
ROYAL BOTANIC GARDEN EDINBURGH
 LECTURE THEATRE

6PM | 1 HOUR | **FREE** BOOKING REQUIRED
 Plants are products of evolution by natural selection. In agriculture, many traits favoured by natural selection are undesirable. So for 10,000 years we have tuned plant genetics for improved food production. Powerful but controversial new techniques raise questions about how and by whom food production should be controlled. Plant biologist **Dame Ottoline Leyser** will explore this new frontier and the nature of the debate that surrounds it.

Presented by Royal Botanic Garden Edinburgh and Botanical Society of Scotland

UGLY ANIMAL PRESERVATION SOCIETY



SHOW
PLEASANCE | CABARET BAR
 6PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

Stand-up comedy with a conservation twist. Enjoy an evening dedicated to raising the profile of some of Mother Nature's more aesthetically challenged children. The panda gets too much attention and the ugly blobfish was made famous by the internet, so now the Ugly Animal Preservation Society move their attention to EDGE (Evolutionary Distinct Globally Endangered). Sit back and laugh as comedians **Simon Watt** and **Rachel Wheeley** join science communicator **Hana Ayoob** to take you through the world's weirdest and most wonderful critters.

WHAT'S SO FUNNY?



DISCUSSION
PLEASANCE | PLEASANCE THEATRE
 6PM | 1 HOUR | **£9/£7/#SCIFIVE £5** | **CC** LIVE CAPTIONING

Why do we laugh and when do people laugh the most? Pioneering researcher into the science of laughter, professor of Cognitive Neuroscience at UCL and regular contributor to BBC Radio 4, **Prof Sophie Scott**, will take you on a journey to discover all of this and more. A scientist studying laughter – it's funnier than you might think!

IN CONVERSATION WITH SUNITA NARAIN



DISCUSSION
THE SCOTTISH PARLIAMENT
 6PM | 90 MINS | **FREE** BOOKING REQUIRED

In a world where temperatures rise year on year and the population are more concerned with societal issues like Brexit, immigration and the economy, how can a generation of environmentally cautious humans help to save our planet? Join Edinburgh Medal recipient **Sunita Narain**, the Indian environmental activist and policy maker, in person and in conversation with Deputy Presiding Officer **Christine Grahame MSP** and streamed live from The Scottish Parliament, to discuss what must be done in our world. Watch the event live online: parliament.scot/science

Presented by the Festival of Politics in association with Edinburgh Science

DEMENTIA: WOULD YOU WANT TO KNOW?



DISCUSSION
PLEASANCE | UPPER HALL
 7.30PM | 80 MINS | **£9/£7/#SCIFIVE £5**

Dementia begins silently, taking hold of someone's brain years before symptoms emerge. However, research using digital technology and data science is working to revolutionise our ability to pick up early signs of brain changes, potentially changing how dementia is diagnosed and treated. Data scientist **Dr Riccardo Marioni**, dementia specialist **Dr Dennis Chan**, ethicist **Dr Richard Milne** and **Olive Munro** who lives with dementia, chaired by **Dr Katy Stubbs** from Alzheimer's Research UK, will be discussing the condition and how we could spot signs earlier.

Presented by Alzheimer's Research UK

AN EVENING WITH GAIA



AGES 18+
SPECIAL EVENT

DYNAMIC EARTH | STRATOSPHERE
 7PM | 3 HOURS | **£15/£12**

To honour the 30th anniversary of the now iconic pale blue dot image, join us for an evening packed with science talks, live music, poetry, and hands-on activities, all in the shadow of the incredible *Gaia* at Dynamic Earth. View our beautiful blue marble as it's seen from space and delight in the evening's entertainment. The evening's lineup includes satellite expert **Dr Murray Collins**, Glasgow-based musician **Nicolette Macleod**, mythologist **Dr Christine Plastow**, geologist **Dr Roger Musson**, poets **Hannah Lavery** and **Leyla Josephine**, in association with the Scottish Poetry Library, and will be hosted by comedian **Susan Morrison**. *Over 18s only.*

Presented in partnership between Edinburgh Science and Dynamic Earth

WHAT ARE UPLAND LANDSCAPES FOR?



DISCUSSION
PLEASANCE | LOMOND ROOM
 7.30PM | 90 MINS | **£9/£7/#SCIFIVE £5**

Hill farming has shaped many parts of the UK, especially Scotland and the North of England, creating landscapes that are iconic and treasured by those who live there and millions of visitors. However, despite its relatively low environmental impact, farming in these areas is challenging. Other uses, such as tourism, forestry and energy production, have been suggested as more economically productive ways of using this land. Join us to find out how we can better manage these activities so that everyone can benefit from our beautiful landscapes.

Presented by The University of Edinburgh

ELEMENT SIX

DISCUSSION



PLEASANCE | PLEASANCE THEATRE

8PM | 90 MINS | £9/£7/#SCIFIVE £5

Professor of planetary and space science, **Prof Monica Grady**, leads a discussion all about our sixth element. Element six is carbon, a really versatile element, diamond hard and candy floss soft. In combination with other elements, especially hydrogen and oxygen, it can exist as a solid, a liquid or a gas. And it's the basis for life. The story of carbon is one of cycles: the astronomical cycle, moving from the interstellar medium into stars, then out again when the stars die. There is a series of interlinked cycles on Earth that move carbon between the atmosphere, the rocky crust and the biosphere. Global climate change occurs when the delicate balance between these cycles is upset. We need carbon for life, but too much of it, and we're as good as dead.

UNIVER-SILLY CHALLENGED

SPECIAL EVENT



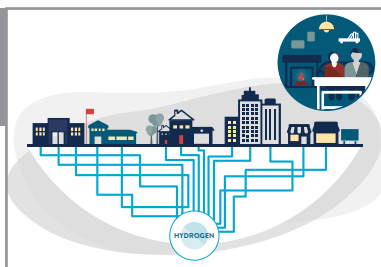
PLEASANCE | CABARET BAR

8PM | 90 MINS | £12/£10/#SCIFIVE £5

Are you ready to have your geek-card challenged? Join comedians **Simon Watt** and **Rachel Wheelley**, along with some special guests, for an anarchic comedy gameshow turned pub quiz that lets you embrace your inner nerd. Win points in wacky rounds, to give your team the advantage in a fiendish final challenge for chance to become the Challenged Champions and go home with a niche prize. Turn up with a team or join in with some random punters you meet on the night.

A HYDROGEN POWERED FUTURE: PIPELINE OR PIPE DREAM

DISCUSSION



NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

8PM | 90 MINS | £9/£7/#SCIFIVE £5

Hydrogen is the most abundant element in our Universe but until now it has been under-utilised within our energy system. Join ARUP's hydrogen expert **Mark Neller** to find out about the exciting future role of hydrogen in helping to accelerate the decarbonisation of our industry, transport and homes. Learn why hydrogen might soon safely power your trains and vehicles, heat your homes, fuel your stoves and store Scotland's excess renewable energy.

Supported by

ARUP



A smorgasbord of insightful discussions, delicious dining experiences and special science-themed presentations, *GastroFest* is the treat to suit all tastes.

A mini festival of the science of food and drink, *GastroFest* showcases the importance of science in our lives in the most delicious way possible: through a series of innovative events exploring the centrality of science to our culinary experience with snacks included!

| | |
|------|--|
| P.34 | CHEESEOLGY 6PM AND 8.30PM 17 APRIL PLEASANCE |
| P.35 | WHEN FOOD MEETS PHYSICS 11AM 18 APRIL PLEASANCE |
| P.36 | EAT SHOOTS AND LEAVES 2PM 18 APRIL PLEASANCE |
| P.37 | COASTS AND COCKTAILS 8PM 18 APRIL PLEASANCE |
| P.39 | IN SEASONING 2PM 19 APRIL PLEASANCE |
| P.41 | WHISKY AND WATER 8PM 19 APRIL PLEASANCE |

Search our website for more event suggestions.



THE SCIENCE OF GIVING

JOIN OUR EXPERIMENT AND EXPERIENCE THE SCIENCE OF GIVING!

HYPOTHESIS

The good feelings we have when we give are reflected in our biology. In a 2006 study, Jorge Moll and colleagues at the National Institutes of Health found that when we donate to charity, regions of the brain associated with pleasure, social connection and trust are activated, creating a 'warm glow' effect from endorphins being released in the brain.



Test the science of giving in 2020 by making a donation to Edinburgh Science!

EXPERIMENT

Find our contactless stations located around Festival venues to make a donation of £2.50. You can also donate when you buy tickets to Science Festival events online.



CONCLUSION

Feel that wonderful warm glow knowing your donation will provide vital support and help deliver our community activities; education workshops in primary schools across Scotland; and our inspiring careers event showing young people the breadth of careers opportunities available to them.



For more information about our work as a charity and how you can support Edinburgh Science, please contact Hannah Schlesinger, our Director of Development, on 0131 553 0320 or hannahs@scifest.co.uk.

Registered Charity no. SC003790.

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
| P.9 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
| P.9 | GAIA AT DYNAMIC EARTH 10AM-4PM DYNAMIC EARTH |
| P.9 | THINK PLASTIC: MATERIALS & MAKING 10AM-5.45PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.9 | PARASITES: BATTLE FOR SURVIVAL 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.10 | PALE BLUE DOT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.10 | SCOTLAND'S PRECIOUS SEAS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.10 | JULIJONAS URBONAS: PLANET OF PEOPLE 10AM-5PM COLLECTIVE |
| P.10 | ENTANGLEMENTS OF TIME AND TIDE 10AM-6PM EDINBURGH PRINTMAKERS |
| P.15 | OCEAN THREADS 11AM-5PM EDINBURGH COLLEGE OF ART |
| P.11 | SYNCRASYS 11AM-6PM SUMMERHALL |

RECURRING EVENTS

| | |
|------|--|
| P.26 | APP FACTORY 11AM PLEASANCE |
| P.26 | ARTIFICIAL INTELLIGENCE 11AM AND 2PM PLEASANCE |
| P.26 | ARTHUR'S SEAT: EDINBURGH'S VOLCANO 2PM DYNAMIC EARTH |
| P.13 | DOME NIGHTS 6PM DYNAMIC EARTH |
| P.12 | CINEHALL: ELEMENTAL 7PM SUMMERHALL |

EUROPEAN STONE STACKING CHAMPIONSHIPS

SPECIAL EVENT



DUNBAR | DUNBAR 'EYE CAVE' BEACH
TIMES VARY | DROP-IN | ON UNTIL SUN 19 APRIL

£10 TO PARTICIPATE/FREE TO WATCH

Rounding off the Science Festival's contribution to Scotland's Year of Coasts and Waters, the *European Stone Stacking Championships* returns for the fourth year. Stone stacking takes materials found in nature and works with Earth's gravity to create sculptural towers, archways and other awe-inspiring structures from rocks and stones. Transient in nature – at the mercy of the elements, tides and time – these wonderful land-art creations merge artistic skill and the laws of physics to amazing effect. With competitions, demonstrations and workshops across the weekend, be amazed by what the professionals can create and try it for yourself! See our website for more details. Please dress appropriately for this outdoor event including sensible footwear and waterproof clothing.

Presented by the European Stone Stacking Championships in association with Edinburgh Science
Image: Laurence Winram



A VERY SHORT INTRODUCTION TO... EXTINCTION

DISCUSSION



PLEASANCE | CABARET BAR
1PM | 1 HOUR | **£7/#SCIFIVE E5**

Extinction has occurred throughout the history of life and nearly all the species that have ever existed have now disappeared. In this very short introduction, **Prof Paul B Wignall** looks at the causes and nature of extinction events, what makes a species vulnerable and the debates in modern science over the role of humans in the climate crisis. Presented by Oxford University Press

EDINBURGH
17
APRIL



PLEASANCE | HIGHLAND ROOM
2PM | 90 MINS | £16

Sometimes we wish for better, bolder endings to our favourite stories but have you ever tried to make one up yourself? In this workshop, you'll discover how to use Twine, a computer programming language, to create an interactive story that changes depending on the decisions the reader makes. Once you're done, you'll be able to share your interactive stories with family and friends. Combining creative writing skills with digital making skills, come along and experiment with technology in a fun and creative environment. For ages 12-17. See p.33 for Interactive Digital Storytelling for Grown Ups.

Presented by Digital Skills Education



PLEASANCE | UPPER HALL
5.30PM | 1 HOUR | £9/£7/#SCIFIVE £5

Bestselling author **Marcus Chown** explores some of the most profound and important science about us, our world and beyond by examining some astonishing facts that reveal the vast complexities of the Universe. Did you know that you could fit the whole human race in the volume of a sugar cube? Or that the electrical energy in a single mosquito is enough to cause a global mass extinction? Join Chown on a mind-bending journey through some of the most weird and wonderful facts about our Universe that govern our everyday lives.

Presented by Michael O'Mara Books



PLEASANCE | LOMOND ROOM
5.30PM | 1 HOUR | £9/£7/#SCIFIVE £5

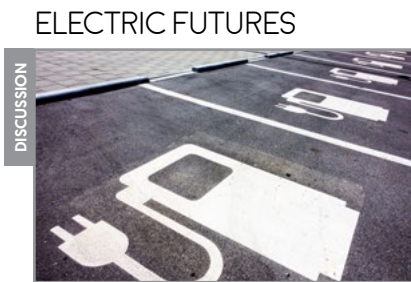
HIV – human immunodeficiency virus – has been making the headlines since the 1980s. While antiretroviral medications allow people living with HIV to better manage the virus, new strains have been discovered as recently as 2019, and many people don't have access to adequate treatment. Former BBC health correspondent, **Eleanor Bradford**, and a panel of experts examine the impacts of HIV on science and society. Do we have a handle on HIV?

LIFE ON THE REEF WITH CALLUM ROBERTS



PLEASANCE | PLEASANCE THEATRE
6PM | 1 HOUR | £12/£10/#SCIFIVE £5 | CC LIVE CAPTIONING

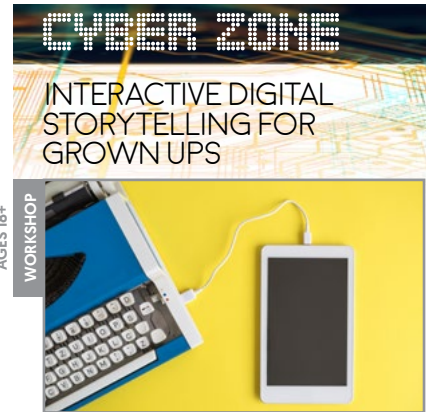
We are big BBC *Blue Planet* fans so we're excited to welcome scientific advisor for *Blue Planet II* and marine conservation biologist **Prof Callum Roberts** to the Science Festival. Explore how reefs became one of the wonders of the ocean world, how we learned to love them and how they now struggle to survive. This is your chance to ask the questions you've always wanted to ask about coral reefs and dive into a true expert's career. Hosted by science communicator **Hana Ayoob**.



PLEASANCE | CABARET BAR
6PM | 1 HOUR | £9/£7/#SCIFIVE £5

Are you ready for an electric adventure? The rise of electric cars, buses and trains is regarded as an environmental success story and something that will help us tackle the climate emergency. Join **Prof Liana Cipcigan** – specialist in sustainable transport – to explore the benefits of electric cars on climate, the environment and human health and Stantec's **Scott Witchalls** to discuss if an electric transport future, and the infrastructure to support it, is something we can expect to see much more of as we move towards a net-zero carbon future.

Supported by



PLEASANCE | HIGHLAND ROOM
6PM | 90 MINS | £16

Have you ever read a story and wished the ending had turned out differently? In this workshop, you'll discover how to use Twine, a computer programming language, to create an interactive story that changes depending on the decisions the reader makes. We'll show you how to share these new interactive stories. This multi-disciplinary workshop combines creative writing skills with digital making skills allowing you to experiment with technology in a fun and creative environment. *Over 18s only. See p.33 for Interactive Digital Storytelling for ages 12-17.*

Presented by Digital Skills Education

CHEESEOLOGY



SPECIAL EVENT

PLEASANCE | QUAKER STUDIO

6PM AND 8.30PM | 90 MINS | **£15** INCLUDES SAMPLES

Cheeseology returns! Exploring the science behind cheesemaking and ripening, dairy technologist **Paul Thomas** and journalist and cheese expert **Patrick McGuigan** are ready to take you on a cheesy journey through some of Europe's finest exports. *Cheeseology* combines a tutored tasting with an exploration of cheesemaker practices and physicochemical parameters which influence texture and flavour development.

THE WORLD OF AI-POWERED CREATIVITY



DISCUSSION

PLEASANCE | LOMOND ROOM

7.30PM | 1 HOUR | **£9/£7**/#SCIFIVE E5

Today's computers are composing music that sounds more Bach than Bach, turning photographs into paintings in the style of Van Gogh's *Starry Night* and even writing screenplays. But are computers truly creative – or are they merely tools to be used by musicians, artists, and writers? **Emeritus Prof Arthur Miller** takes us on a tour of creativity in the age of machines. Arguing that computers can already be as creative as humans – and someday will surpass us, Miller celebrates the creative possibilities of artificial intelligence in art, music and literature.

Presented by MIT Press

AETHER IN THE ARCHWAYS



SPECIAL EVENT

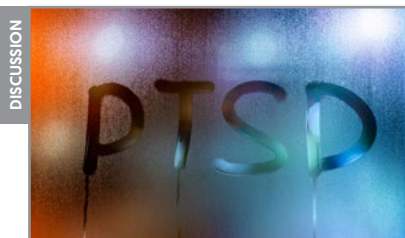
ST GILES CATHEDRAL

7.30PM | 90 MINS | **£12/£9/£6** STUDENTS

Combining centuries of musical legacy with the frontiers of contemporary music and set against the magical backdrop of St Giles' Cathedral, this special evening concert and discussion will lead you on a journey through new music, science and sound. Join us in learning about cutting-edge contemporary music where communities and choirs have been performing through the past nine centuries.

Presented by St Giles' Cathedral

PTSD: A HIDDEN WOUND



DISCUSSION

PLEASANCE | UPPER HALL

7.30PM | 90 MINS | **£9/£7**/#SCIFIVE E5

Many people have hidden scars and Post-traumatic Stress Disorder (PTSD) is one such scar that is triggered by significant trauma and can change the way the brain responds to everyday situations. Research psychologist **Peter Naish**, who investigated how best to detect and protect against PTSD, joins us to discuss the connection between PTSD and hypnosis, describing their similar mechanisms and giving case histories to illustrate the treatment of PTSD with hypnosis.

THE CROWD AND THE COSMOS



DISCUSSION

PLEASANCE | PLEASANCE THEATRE

8PM | 90 MINS | **£9/£7**/#SCIFIVE E5

The world of science has been transformed. Where once we sat and worked out our problems, we now rely on computers to do the hard work. But humans still have unique capabilities – curiosity, our capacity for wonder and our capacity for surprise – and it seems that humans and computers working together do better than computers can on their own. Join astronomer and BBC TV *The Sky at Night* presenter **Prof Chris Lintott** for a fascinating account of the popular web-based *Zooniverse* project, which enables hundreds of thousands of ordinary people to take part in cutting-edge science.

Presented by Oxford University Press

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
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RECURRING EVENTS

| | |
|------|--|
| P.26 | APP FACTORY 11AM PLEASANCE |
| P.26 | ARTIFICIAL INTELLIGENCE 11AM PLEASANCE |
| P.24 | FROM LIVING PLANTS TO FOSSILS 2PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.12 | CINEHALL: ELEMENTAL 7PM SUMMERHALL |
| P.63 | EUROPEAN STONE STACKING CHAMPIONSHIPS TIMES VARY DUNBAR |

SATURDAY
18
APRIL

WHEN FOOD MEETS PHYSICS



SPECIAL EVENT

PLEASANCE | QUAKER STUDIO

11AM | 90 MINS | £15/£12 INCLUDES SAMPLES

Join **Lucinda Bruce-Gardyne**, founder of Genius Gluten Free, and **Prof Wilson Poon** of the School of Physics and Astronomy at Edinburgh University, for an interactive demonstration. They'll bake some gluten free and gluten containing breads to show why delicious gluten free bread is so hard to make - it takes both culinary and scientific expertise! Throughout, Lucinda will be sharing some fascinating insights on how to love your gut!

Presented by Genius Foods

SECRETS OF THE SPACE ROCKET



DISCUSSION

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

12.30PM | 1 HOUR | £9/£7/#SCIFIVE £5

Geographer, *Guardian* writer and author of *Escape From Earth*, **Dr Fraser MacDonald** takes you on a wild ride through the untold story of the engineers, dreamers and rebels who started the American space programme. Hosted by science communicator **Siân Hickson**, this snapshot of a historic era will introduce you to the founder of Nasa's Jet Propulsion Laboratory and a story of soaring ideals entangled in the most human of complications: infidelity and divorce, betrayal and treason.

Presented by Profile Books Ltd

CREATIVITY OF SCIENCE AND SCIENCE OF CREATIVITY



AGES 16+

WORKSHOP

PLEASANCE | CABARET BAR

1PM | 90 MINS | £12

Dr Sinead Collins, an evolutionary biologist at The University of Edinburgh, and **Laura Lam**, science fiction author and creative writing lecturer at Edinburgh Napier University, have careers that are both creative and highly systematic. Lam will discuss the research for her latest book, *Goldilocks*, into subjects such as space travel, climate change, astronaut training, and a surprising amount about spirulina, where she relied on Collins' expertise. Test creative hypotheses to create vibrant, alien worlds and illustrate how writing a book and doing science are not as different as they might first appear. *Over 16s only.*

Presented by Edinburgh Napier University

TIRED OF BEING TIRED?



DISCUSSION

PLEASANCE | PLEASANCE THEATRE

2PM | 1 HOUR | £9/£7/#SCIFIVE £5 | LIVE CAPTIONING

Today busyness has become a badge of honour. We want to say we're busy, yet at the same time we feel exhausted. Counting down through the top ten activities which people find most restful, **Claudia Hammond**, presenter of BBC science programme *All in the Mind*, explains why rest matters and offers a roadmap for a new, more restful and balanced life.

Presented by Canongate Books

THINK PLASTIC



DISCUSSION

ROYAL BOTANIC GARDEN EDINBURGH

LECTURE THEATRE

2PM | 1 HOUR | £5

Sir David Attenborough's *Blue Planet* effect is credited with altering our attitude to plastic pollution and yet plastic is an incredibly versatile material that has done a lot to improve our lives. Botanist **Dr Peter Wilkie**, polymer chemist **Prof Mike Shaver** and artists **Lorna Fraser**, **Carol Sinclair**, **Fiona Hutchison**, **Carla Edwards** and **Fiona Pilgrim** have brought art and science together in a collaboration that aims to encourage people to think about plastic. *This event is linked to the exhibition Think Plastic: Materials and Making.*

Presented by Royal Botanic Garden Edinburgh

VIRTUAL HUMANITY WITH TOM POLLOCK AND LAUREN JAMES



DISCUSSION

PLEASANCE | UPPER HALL

2PM | 1 HOUR | £9/£7/#SCIFIVE £5

Join popular authors of young adult sci-fi **Tom Pollock** and **Lauren James** in conversation with writer **Siân Bevan** about their new books, *Heartstream* and *The Quiet at the End of the World*. Step into two literary worlds where dystopian social networks and the evolution of technology are blurring the lines between fiction and reality - and even changing the definition of humanity itself. Learn how these two crafters of worlds weave their narratives and present to us two possible futures for the human race.

Presented by Walker Books



WORKSHOP

CYBER ZONE

CREATE A VIRTUAL REALITY WORLD

WORKSHOP

PLEASANCE | HIGHLAND ROOM

2PM | 90 MINS | £16

Get creative with technology and learn how to create your own virtual reality world! You'll use Mozilla VR to remix your own experience using code then test it out and share with your friends. You can even share it online for the world to see! *No experience is required but please bring your own smartphone. For ages 12-17. See p.36 for Create A Virtual Reality World for Grown Ups.*

Presented by Digital Skills Education



AGES 18+

WORKSHOP

CYBER ZONE

CODING FOR GROWN UPS

WORKSHOP

PLEASANCE | OCHIL ROOM

2PM AND 6PM | 90 MINS | ALSO ON SUN 19 APRIL | £16

Interested in learning more about coding? CodeClan's team are on hand to help! Complete beginners and more advanced coders are welcome to learn all about the programming language Ruby and how to create your own simple code before putting your new knowledge to the test in this tech-taster session. Be warned - coding can be addictive. *Over 18s only.*

Supported by



EAT SHOOTS AND LEAVES



SPECIAL EVENT

PLEASANCE | QUAKER STUDIO
 2PM | 90 MINS | £15/£12 INCLUDES SAMPLES

Want to explore the world of plant based meals but don't know how? Don't worry, we have all the helpful tips and tricks that will help you master the exciting world of vegan produce. Our panel, including **Josiah Meldrum** of the award-winning company Hodmedods, will help us explore the science behind plant-based plates while we taste a range of snacks from Harmonium that are free from meat, dairy and judgement.

REVEALING RESEARCH: BRIGHT YOUNG MINDS



SPECIAL EVENT

WESTERN GENERAL HOSPITAL
 CRUK EDINBURGH CENTRE
 2PM | 2 HOURS | FREE BOOKING REQUIRED

We invite you to go behind the scenes to explore the latest developments in cancer research and meet the pioneering individuals making it happen. This special event celebrates inspirational cancer researchers at the dawn of their careers. A fantastic opportunity to meet the future leaders of research – the event will include lightning talks and guided laboratory tours led by our PhD researchers – you will be blown away by their innovative ideas!

Presented by Cancer Research UK

OUR ELEMENTAL PAST



DISCUSSION

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
 3PM | 90 MINS | FREE BOOKING REQUIRED

On World Heritage Day, meet some of archaeological science's best communicators of fascinating topics, themed around earth, air, fire and water. Chaired by broadcaster and comedian **Susan Morrison**, four experts give short talks on the Earth's elements. **Dr Nick Hannon** will explore LIDAR on Antonine Wall, **Dr Jo McKenzie** looks down the microscope at Ness of Brodgar, **Dr Matthew Knight** examines the Bronze Age Weapons from Duddingston Loch and **Alice Lyall** discusses the effects of climate change on Neolithic Orkney World Heritage Site.

Presented by the Society of Antiquaries of Scotland

DECADE FOR DECISIONS



DISCUSSION

PLEASANCE | UPPER HALL
 5.30PM | 1 HOUR | £9/£7/#SCIFIVE £5

You wouldn't fly an aeroplane without a fuel gauge, so why run our economy without knowing the demands on our natural resources? Recognising this, **Dr Mathis Wackernagel** co-created such a fuel gauge for our planet – *The Ecological Footprint*. Mathis's influence extends to the UN and many of the world's leading economies. Today, Mathis explores the implications of running economies without a fuel gauge. One is our environmental Pyramid Scheme, where humanity is robbing the future's resources to pay for the present. How does this translate into risks and opportunities for Scotland?

Supported by



DEEP DIVE INTO DEEPPAKES



DISCUSSION

PLEASANCE | LOMOND ROOM
 5.30PM | 1 HOUR | £9/£7/#SCIFIVE £5

You've been accused of a crime you did not commit but the police say they have video evidence that shows it was you. This hasn't happened yet but it might. Deepfakes, the technique of human image synthesis based on/powered by Artificial Intelligence and Machine Learning, have made it possible to produce almost perfect fake footage. While the disadvantages of deepfakes are pretty obvious could it have its advantages too? Join **Dr Kate Devlin**, Senior Lecturer in Social and Cultural Artificial Intelligence in conversation with **Prof Lilian Edwards**, leading academic in the field of Internet law, as they delve into the dark world of deepfakes.

QUEER BY NATURE



SHOW

PLEASANCE | CABARET BAR
 6PM | 1 HOUR | £9/£7/#SCIFIVE £5

What do penguins, lizards, sheep and humans all have in common? They all engage in homosexual behaviour. A bisexual woman armed with a biochemistry degree and committed to investigating the science behind her identity, comedian **Florence Schechter** takes us on a hilarious and thought-provoking tour of LGBTQ+ behaviour in animals and the evolutionary benefits of being queer. Expect laughs, single innuendos and a whole load of fun, sexy, science facts. *Please note this event includes some graphic descriptions of a sexual nature.*

ONE BIN TO RULE THEM ALL



DISCUSSION

ROYAL BOTANIC GARDEN EDINBURGH
 LECTURE THEATRE
 6PM | 1 HOUR | £5

Plastics are remarkable materials but we think of them as worthless. Treating plastic with value will circularise our economy but what are the barriers to unlocking this change in view? Join **Prof Mike Shaver** of the Henry Royce Institute to explore the future of plastics and waste management. *This event is linked to the exhibition Think Plastic: Materials and Making.*

Presented by Royal Botanic Garden Edinburgh

SUMMITTING THE SCIENCE OF EVEREST



DISCUSSION

PLEASANCE | PLEASANCE THEATRE
 6PM | 1 HOUR | £9/£7/#SCIFIVE £5

Mount Everest – the ultimate endurance challenge – is a place where science plays a huge part in performance and survival. Telling the story of her own summit attempt, physicist and adventurer **Dr Melanie Windridge** investigates how advances in science and technology enable ordinary people to summit and survive the extremes.



AGES 18+ WORKSHOP

PLEASANCE | HIGHLAND ROOM
 6PM | 90 MINS | £16

Get creative with technology and learn how to create your own virtual reality world in this adults only session! You'll use Mozilla VR to remix your own experience using code then test it out and share with your friends. You can even share it online for the world to see! *No experience is required but please bring your own smartphone. Over 18s only. See p.35 for Create A Virtual Reality World for ages 12-17.*

Presented by Digital Skills Education

BREATHE IN: THE GLOBAL CLEAN AIR CRISIS

DISCUSSION



PLEASANCE | LOMOND ROOM

7.30PM | 90 MINS | **£9/£7/#SCIFIVE £5**

Nitrogen, Oxygen and 'other stuff' – the simple answer to 'what is air?'. But we know the simple answer isn't the full story, as air quality varies depending on where we live, work and play. Discover how we measure the quality of the air we breathe as we discuss what action can be taken to ensure a clean air future for everyone in Scotland and beyond. Our panel of experts include **Dr Suzanne Bartington**, whose research focuses on the health, social and economic impacts of air pollution and **Dr Stuart Sneddon**, local and international air quality specialist. Hosted by **Eleanor Bradford**.

SMART CITIES: TODAY AND TOMORROW

DISCUSSION



PLEASANCE | UPPER HALL

7.30PM | 90 MINS | **£9/£7/#SCIFIVE £5**

More than half of the people in the world today live in urban areas, and by 2050, the UN predicts that this will rise to 68% of global populations. As society expands, technology is enabling change in urban experiences and cities are becoming smarter as a result. Join our panel, including expert in urban futures **Prof Simon Joss** and CityFibre's **Elaine Doherty** to discuss the ways that Edinburgh can be transformed into a smarter, more people-centred city of the future.

Supported by

CityFibre

GENERATION SHARE

DISCUSSION



PLEASANCE | PLEASANCE THEATRE

8PM | 90 MINS | **£9/£7/#SCIFIVE £5**

Benita Matofska is a world-leading change-maker and founder of The People Who Share and Global Sharing Week. She is recognised as a global expert in the Sharing Economy, a phenomenon that is causing the most significant shift in society since the Industrial Revolution. Join her as she discusses the science of sharing, shares her own story and those of the 200 change-makers featured in her book. Hosted by **Mairi Oliver** from Lighthouse – Edinburgh's radical bookshop.

OUT THINKERS

DISCUSSION



PLEASANCE | CABARET BAR

8PM | 90 MINS | **£9/£7/#SCIFIVE £5**

Providing a platform for the LGBTQ+ community in Scotland, join Out Thinkers' four incredible speakers – **Bethany Smith**, **Dr Amy Sweeny**, **Dr Adam Ostrowski** and **Dr Sinead Collins** – to discuss sustainability, breakthrough energy sources, conservation and our changing planet. Discover thought-provoking insights on the world around us from a new perspective. Hosted by **Alfredo Carpineti**.

Presented by Pride in STEM

COASTS AND COCKTAILS

AGES 18+
SPECIAL EVENT



PLEASANCE | QUAKER STUDIO

8PM | 90 MINS | **£20/£18 INCLUDES DRINKS**

Scotland has over 10,000 miles of coastline and a huge population that lives and works beside it. It's time to celebrate our bodies of water with an evening of entertainment featuring poet **Janette Ayachi** and Neu Reekie's **Michael Pedersen**, in association with the Scottish Poetry Library, with songs and stories from host **Nicolette Macleod**. Close out the final Saturday of the 2020 Science Festival in style with a couple of complimentary sea-themed cocktails to make you feel less like a fish out of water! *Over 18s only.*

Supported by



LGBTQ+STEM

Science is for everyone, and embracing diversity is vital for scientific innovations that support both people and planet. Edinburgh has a long history of being a hub for culture, progressive thinking and innovation; and despite the challenges that the global society faces, the importance of diversity, equality and inclusivity in cultivating healthy and thriving communities is beginning to be recognised. As part of our commitment to delivering an inclusive Festival for everyone, we're proud to be delivering an evening celebrating LGBTQ+ identities in STEM. Join us in stepping into new ideas and embracing a whole spectrum of experiences.

P.36 P.36

QUEER BY NATURE | 6PM
18 APRIL | PLEASANCE

P.37 P.37

OUT THINKERS | 8PM
18 APRIL | PLEASANCE

COMBATTING THE CLIMATE EMERGENCY



'Scotland has everything it takes to show international leadership by charting a concrete path to carbon neutrality by 2045. With the 26th Conference of the Parties coming to the UK in 2020, it is time for Scotland to lay out this path.'

CHRISTIANA FIGUERES

FORMER EXECUTIVE SECRETARY, UN CLIMATE CONVENTION



'Scotland has already halved greenhouse gas emissions while growing the economy and increasing productivity and employment. Our ambition now is to end our contribution to climate change, definitively, within a generation. It is encouraging to see Edinburgh Science bringing leaders from multiple sectors together to collaborate on being part of the solution.'

ROSEANNA CUNNINGHAM

CABINET SECRETARY FOR ENVIRONMENT, CLIMATE
CHANGE AND LAND REFORM

Edinburgh Science accepts that we are in a climate emergency and we are determined to show leadership in tackling the world's climate crisis. Through our programmes we have a long-held commitment to bringing issues of environment and sustainability to the public's attention and we are delighted to announce an expansion of this work through the *Climate Opportunities Ideas Factory*.

Inspired by Christiana Figueres' visit to the 2019 Edinburgh Science Festival we have convened a working group of senior leaders from business, academia, third and public sectors, and urged them to work collaboratively to help Scotland reach its ambitious climate targets.

Through the *Climate Opportunities Ideas Factory* we are encouraging, supporting and facilitating these leaders as they address the challenges and opportunities that the climate revolution will bring.

The *Climate Opportunities Ideas Factory* will continue to meet regularly and we are excited to work towards bringing innovative ideas into reality as we approach COP26 Glasgow in November 2020. Look out for announcements throughout the year.

We would like to thank the many organisations involved in supporting this exciting and unique project, particularly our 2020 Programme Supporters and Founder Members.

For more information about the *Climate Opportunities Ideas Factory* visit sciencefestival.co.uk/sustainability or contact our Director of Development, Hannah Schlesinger hannahs@scifest.co.uk

PROGRAMME SUPPORTERS



Investment managers



Scottish Government
Riaghaltas na h-Alba
gov.scot

FOUNDER MEMBERS



Highlands and Islands Enterprise
Iomairt na Gàidhealtachd 's nan Eilean

Jacobs



Scottish Environment
Protection Agency
Buidheann Dion
Àrainneachd na h-Alba



Scottish Natural Heritage
Dualchas Nàdair na h-Alba
nature.scot

Royal Bank
of Scotland



ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
| P.9 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
| P.9 | GAIA AT DYNAMIC EARTH 10AM-4PM DYNAMIC EARTH |
| P.9 | THINK PLASTIC: MATERIALS & MAKING 10AM-5.45PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.9 | PARASITES: BATTLE FOR SURVIVAL 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.10 | PALE BLUE DOT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.10 | SCOTLAND'S PRECIOUS SEAS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.10 | JULIJONAS URBONAS: PLANET OF PEOPLE 10AM-5PM COLLECTIVE |
| P.10 | ENTANGLEMENTS OF TIME AND TIDE 10AM-6PM EDINBURGH PRINTMAKERS |
| P.15 | OCEAN THREADS 11AM-5PM EDINBURGH COLLEGE OF ART |
| P.11 | SYNCRASY 11AM-6PM SUMMERHALL |

RECURRING EVENTS

| | |
|------|---|
| P.26 | APP FACTORY 11AM AND 2PM PLEASANCE |
| P.26 | ARTIFICIAL INTELLIGENCE 11AM PLEASANCE |
| P.26 | ARTHUR'S SEAT: EDINBURGH'S VOLCANO 2PM DYNAMIC EARTH |
| P.35 | CODING FOR GROWN UPS 2PM AND 6PM PLEASANCE |
| P.13 | DOME NIGHTS 6PM DYNAMIC EARTH |
| P.63 | EUROPEAN STONE STACKING CHAMPIONSHIPS TIMES VARY DUNBAR |

HEAL THE WORLD



ACTIVITY

NATIONAL MUSEUM OF SCOTLAND
LEARNING CENTRE LEVEL 2
11AM, 1.15PM AND 3.15PM | 75 MINS | **£9/£7/#SCIFIVE £5**

Can you save the world from a terrifying disease? There's been an outbreak, somewhere in the world, of an illness that threatens to go global. In this collaborative, larger-than-life game, you'll be the pieces as you work together to cure the epidemic. Ultimately, you'll need to develop a new medicine to cure the disease and save the world. As you save our imaginary world, you'll gain insight into the challenge facing the Wellcome Centre for Anti-Infectives Research's scientists.

Presented by the University of Dundee

SCIENCE FESTIVAL CHURCH SERVICE



SPECIAL EVENT

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

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

CONSUME. DISCARD. REPEAT



DISCUSSION

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
12.30PM | 90 MINS | **£9/£7/#SCIFIVE £5**

Nowadays, it's a lot easier to get what we want. Need to upgrade your smartphone? Sure. Want some seasonal fruit and veg? No need to wait until summer – just import them. But convenience comes with a price and we need to think about the perils of irresponsible consumerism. We'll be scrutinising disposable devices with e-waste researcher **Dr Jacquetta Lee**, sustainable nutrition with food systems activist **Simon Kenton-Lake** and the consequences of fast fashion with **Prof Kate Fletcher**. Hosted by **Dan Holland** from BBC Radio Scotland's *Brainwaves*.

8,000 YEAR LOVE AFFAIR



DISCUSSION

ROYAL BOTANIC GARDEN EDINBURGH
LECTURE THEATRE
2PM | 1 HOUR | **£5**

The story of the tattie has all the ups and downs of a love affair. Beginning in the high Andes of South America it could not have been predicted that the potato would become the world's fourth most consumed food crop. On its journey around the world the potato has been stalked by various diseases and science is locked in an arms race to overcome them. Geneticist **Dr Ingo Hein** shares this tasty tale. *This event is linked to the UN International Year of Plant Health.*

Presented by Royal Botanic Garden Edinburgh

IN SEASONING



SPECIAL EVENT

PLEASANCE | QUAKER STUDIO
2PM | 90 MINS | **£15/£12 INCLUDES SAMPLES**

Scotland's coasts have provided us with food and drink for thousands of years. More recently, a number of local companies have returned to the waters in order to find better ways of collecting, preparing and seasoning our food. Join food science expert **Dr Stuart Farrimond**, **Fiona Houston** from Mara Seaweed, and **Jan Hodel** from the International Centre for Brewing and Distilling, as they explore the nature of spices and seasonings and how they add a smack of flavour to your favourite food and drink.



SUNDAE
19
APRIL

STRANGE ICE WITH ANDREA SELLA



DISCUSSION

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
3PM | 90 MINS | **£9/£7/#SCIFIVE £5**

Water ice is one of the strangest materials in our world but also one of the most familiar. But our comfort in dealing with ice is misplaced – it is a rule-breaker whose unique properties make life as we know it possible. Could ice hold the answers as to why we fall for fake news? In this event, chemist and broadcaster **Prof Andrea Sella** takes a close look at ice and other ices to open a gateway into misconception, misunderstanding and misinformation.

A USER'S GUIDE TO THE ATMOSPHERE



DISCUSSION

PLEASANCE | LOMOND ROOM
5.30PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

From the atmosphere on distant planets to the stuff that gets into your lungs, from holes in the ozone layer to lazy and disappearing gases, air quality specialist and full-time breather **Dr Mark Broomfield** combines scientific evidence with personal stories and advice on what you can do to improve air quality, giving you the low-down on what's up high.

Presented by Duckworth Books

THE COSMIC REVOLUTIONARY'S HANDBOOK



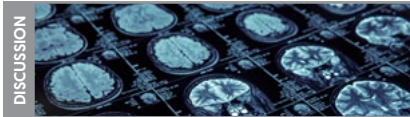
DISCUSSION

NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM
5.30PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

Free yourself from cosmological tyranny! For all those who wonder about this bizarre Universe and those who want to overthrow the big bang, astronomer **Dr Luke Barnes** and astrophysicist **Prof Geraint Lewis** are here to give you 'just the facts'. They'll pull back the curtains, and show how cosmology really works and provide a tour of modern cosmology along the way.

Presented by Cambridge University Press

10 VOYAGES THROUGH THE HUMAN MIND



DISCUSSION

PLEASANCE | UPPER HALL
5.30PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

Undoubtedly the most complex material in the Universe, the human brain makes us who we are but how it works and why has long been a mystery. Pulling together a series of fascinating lectures, spanning over a hundred years and knowledge from experts in the fields of psychology, neurology and biology, science journalist **Catherine de Lange** takes a look at the staggering capabilities of the human brain, revealing a hidden and complex world.

Presented by Michael O'Mara Books

SATELLITE'S EYE VIEW



DISCUSSION

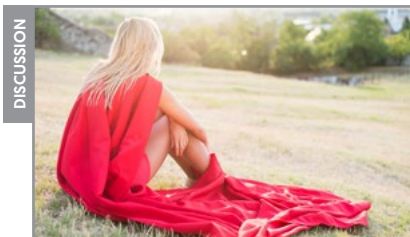
PLEASANCE | PLEASANCE THEATRE
6PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

There are over 1,000 human-made satellites orbiting Earth, collecting information and beaming it back for us to use for industries like conservation and deforestation among others. Join us to discuss how we can best use this space-gathered data to help us with some of the biggest challenges facing us here on Earth.

Supported by



PERIOD POWER



DISCUSSION

PLEASANCE | CABARET BAR
6PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

Here to tell all about *Period Power*, her profound and practical blueprint for aligning daily life with your menstrual cycle, **Maisie Hill** is the periods and hormones expert that humans with uteruses deserve. Arguing that our hormones are there to serve us and, if utilised correctly, can be used to help you get what you want out of life, Hill believes that yes, we are hormonal, and that's a very good thing.

Presented by Bloomsbury Publishing

ENGINEERING FOR SPORTING SUCCESS



DISCUSSION

PLEASANCE | LOMOND
7.30PM | 90 MINS | **£9/£7/#SCIFIVE £5**

Every sport you can possibly take part in involves some element of engineering, be it swimming, running, skeleton or javelin. Join sport engineering specialist **Prof David James** to explore the challenges and successes of designing equipment which help the sporting stars we love to watch, and the tools for the sports we love to play in an increasingly scientific sporting arena. Hosted by **Dan Holland** from BBC Radio Scotland's *Brainwaves*.

THE EMOTIONAL ROBOT REVOLUTION



DISCUSSION

PLEASANCE | UPPER HALL
7.30PM | 1 HOUR | **£9/£7/#SCIFIVE £5**

Your new best friend is a robot. Well, maybe one day. Researchers are working hard to make compassionate robots as our society becomes increasingly dependant on the care system. In a few years we could even see the very early editions of robots designed to care for humans in old age. The care may be technically perfect but how good of a friend will they be? Discover more about this revolution with **Dr Kate Devlin**, senior lecturer in social and cultural artificial intelligence, in conversation about emotional robots, AI and what it means for future friendly robots.

10,000 DECISIONS

SHOW



PLEASANCE | CABARET BAR

8PM | 1 HOUR | £9/£7/#SCIFIVE £5

Good or bad, our decisions make us who we are. American comedian **Robyn Perkins** brings her Sydney Fringe Comedy award-winning show to the Edinburgh Science Festival! *10,000 Decisions* uses a series of hilarious personal anecdotes, family stories and neuroscience to come up with a well thought out decision for one anonymous audience member. It's quirky, thought-provoking and fun, laced with intriguing science.

WHISKY AND WATER

AGES 18+

SPECIAL EVENT



PLEASANCE | QUAKER STUDIO

8PM | 90 MINS | £20/£18 INCLUDES SAMPLES

It is one of the world's most loved spirits, with a history stretching back as far as we can remember, but what makes Scottish whisky so great might surprise you. Our expert panel will guide you through the symbiotic relationship between Scotland's most famous drink and the environment in which it is made. Join us for a tippie provided by Isle of Arran Distillers and find out why the whisky industry just might be as important to Scottish water as Scottish water is to whisky. *Snacks and samples are provided. Over 18s only.*

Supported by



10 CLIMATE COMMANDMENTS

DISCUSSION



PLEASANCE | PLEASANCE THEATRE

8PM | 90 MINS | £9/£7/#SCIFIVE £5

Reducing our carbon footprint can be a daunting task – especially if you don't know where to start or how big of a change you need to make. Help comedian **Susan Morrison** put climate crisis podcaster **Hazel Darwin-Clements** and other performers to the test as they convince us what little – and large – changes we can make in our daily lives to help pave the way to becoming a carbon-neutral country.

LIQUIDS: DELIGHTFUL AND DANGEROUS SUBSTANCES

DISCUSSION



NATIONAL MUSEUM OF SCOTLAND | AUDITORIUM

8PM | 90 MINS | £9/£7/#SCIFIVE £5

CC LIVE CAPTIONING

Bestselling author, scientist and engineer **Prof Mark Miodownik** takes us on a tour of the droplets, heartbeats and ocean waves that we come across every day. Hosted by **Prof Andrea Sella**, with live demonstrations, discover how the liquid properties of water are core to many of the impacts of climate change including the rise in sea-levels and increasing flooding. Miodownik and Sella show how liquids can be fascinating whilst also bringing death and destruction.

CREATING AN ACCESSIBLE FESTIVAL

Each event at the Science Festival is different. We have workshops, discussions, activities, exhibitions and more. In order to make our Festival more accessible, we are offering a range of services and events to make your visit more enjoyable.

RP Sensory Backpacks

We have partnered with the Edinburgh Festival Fringe Society to offer sensory backpacks. These can be collected from the National Museum of Scotland, Pleasance and City Art Centre using a form of photo ID and a phone number or email.

RP Relaxed Performances and Autism-Friendly Sessions

There will be several relaxed performances at the Science Festival this year. These are *The Whirlybird* (p.60) on Wednesday 15 April, *One Little Windmill: Sensory Stories* and *Two in a Barrel* (p.63) on Friday 17 April.

Science Pop-Ups at Edinburgh Zoo will have an autism-friendly session on Friday 17 April, 10am–11am (p.63). Royal Botanic Garden Edinburgh will be hosting a relaxed session of *Found and Woven* on Thursday 16 April (p.29).

To provide an accessible environment for families with autistic children we are hosting two autism-friendly sessions from 9am–10am on Tuesday 7 and Thursday 9 April at the National Museum of Scotland for *Pale Blue Dot* (p.50).

RP Changing Places PAMILOO at Pleasance

On Saturday 11, Sunday 12, Wednesday 15 and Friday 17 April we will have a mobile changing place PAMILOO at Pleasance to accompany the *Dinosaur Weekend* and relaxed performances. The PAMILOO is a mobile toilet with hoist and changing table. Please bring your own sling if you wish to use the hoist. pamis.org.uk.

RP BSL

On Sunday 5 April **Dr Adam Rutherford's** event, *How to Argue with a Racist*, (p.13) will have a BSL interpreter present.

CC Live Captioning

There will be four live captioned performances this year. Those events are:

What's So Funny? (p.30)

Life on the Reef with Callum Roberts (p.33)

Tired of Being Tired? (p.35)

Liquids: Delightful and Dangerous Substances (p.41)

RP Hearing Loop

Pleasance Theatre and National Museum of Scotland have a hearing loop for hearing aids set to the 'T' setting.

For any questions regarding accessibility, please email access@scifest.co.uk or call the Box Office on 0131 226 0005.

Supported by The Boshier-Hinton Foundation

WELCOME TO THE SCIENCE FESTIVAL

EVENTS FOR CHILDREN AND FAMILIES

We've grouped some highlights below but over the next few pages you'll find details of events suitable for children aged 0-12, perfect for families and science fans of all ages.

To view our programme for adults and young people, head to p.8-41.

FAMILY FUN AT THE FESTIVAL

SCIENCE PLAYGROUND

Spend a day at City Art Centre, where you'll find workshops and activities perfect for everyone under 12 and their families. The average visit to City Art Centre takes four to five hours and will keep everyone entertained. Some workshops are kids-only so there's even time to grab a coffee and relax.

PREHISTORIC PLEASANCE

For a tricera-top adventure head to *Dinosaur Weekend* (p.54) at Pleasance and take part in our roar-some activities. A half-day ticket includes a dinosaur show - *Prehistoric Beasts and How to Know Them* - and a host of cretaceous crafts.

SENSATIONAL SHOWS AND WORKSHOPS

Pleasance will also be hosting shows and workshops for all ages - *StrongWomen Science* (p.65) and *Robot Chef* (p.64) will delight audiences in Pleasance Theatre while *Cyber Zone* (p.21) gives everyone the chance to get hacking and code cracking with workshops suitable for children and young adults.

EXPLORE OUR OCEANS

Pale Blue Dot (p.47) at the National Museum of Scotland is a multi-sensory exploration of everything marine and The University of Edinburgh will present a programme of family-friendly workshops and activities in the Learning Centre.

MORE TO ENJOY

Around Edinburgh, you'll find Easter trails at the Royal Botanic Gardens, meet the keepers at Edinburgh Zoo and have the chance to marvel at *Gaia* - a huge scale model of Earth - at Dynamic Earth.

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



CITY ART CENTRE

9.30AM-4.30PM

ALLOW 4-5 HOURS FOR YOUR VISIT

SATURDAY 4-SATURDAY 18 APRIL

(NOT SUNDAYS)

Edinburgh Science Festival at City Art Centre is the perfect, inspirational day out. Explore five floors packed with shows, workshops and interactive events perfect for kids up to 12 years old. Parents can join in the fun too with drop-in workshops and our digital art exhibitions, see p.45.

GIFT AID SCHEME

Edinburgh Science Foundation, which runs Edinburgh Science Festival, is an educational charity. All ticket prices for City Art Centre include a voluntary 10% donation to support our work. For UK tax payers, this also allows us to reclaim the tax you pay through the Gift Aid Scheme; every pound you pay is worth £1.25 to us. If you do not wish to make a charitable donation, the admission prices for City Art Centre are Adult £7.27, Child 5+ £9.09, Child 3-4 £4.54

giftaid it

CITY ART CENTRE SCHOOL DAYS

Our science playground, covering five floors of activities galore in City Art Centre, opens up two days early each year to enable school groups across Edinburgh to access this family space!

Thanks to support from our Headline Edinburgh Science Learning Sponsor, Baillie Gifford, Edina Trust and The Russell Trust for making this possible.

For more information about our community engagement and outreach work, visit sciencefestival.co.uk/community-engagement

Supported by



Investment managers

Edina Trust

4 APRIL

VENUE SPONSOR



CITY

ART

CENTRE



AGES 0-2 GO FREE

ADULTS GO FREE AT EASTER

Book a child's day pass and receive free adult entry on Friday 10, Saturday 11 and Monday 13 April. Call Box Office or book online – simply add a child's pass and an adult pass to your basket and use the promo code **EASTEREGG20**.

HOW TO BOOK YOUR CITY ART CENTRE DAY PASS

A day pass allows entry to City Art Centre. A child 5+ day pass includes up to three bookable events – see the schedule for start times. We recommend booking your day pass and selected events to avoid queues and disappointment. Tickets purchased from City Art Centre on the day of the event cost £1 more per-ticket.

Drop-in activities do not need to be pre-booked and can be enjoyed by all the family, including younger children, 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 0131 226 0005 and they will be happy to help you plan your visit.

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 5+ 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. Your child may be asked to leave the workshop if they are under the recommended age.

| 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 |
|-----|----------------------------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|
| 5+ | BUZZ ABOUT BEES 20 MINS | | | | | | | | | | | | | | |
| 5+ | SPLAT-TASTIC 20 MINS | | | | | | | | | | | | | | |
| 5+ | LITTLE SPARKS 45 MINS | | | | | | | | | | | | | | |
| 5+ | WILD VETS 45 MINS | | | | | | | | | | | | | | |
| 5+ | ENERGY MAKERS 45 MINS | | | | | | | | | | | | | | |
| 7+ | CREATIVE CODING 45 MINS | | | | | | | | | | | | | | |
| 7+ | CUBESAT CREATOR 45 MINS | | | | | | | | | | | | | | |
| 7+ | MINI MECHANICS 20 MINS | | | | | | | | | | | | | | |
| 8+ | ER SURGERY 45 MINS | | | | | | | | | | | | | | |

WEE WONDER WORLD



AGES 3+
ACTIVITY

CITY ART CENTRE

9.30AM-4.30PM | DROP-IN

Step up small scientists! Explore why things float, enjoy science story time, construct a tremendous tower, build your own spinning toy or create a musical instrument. It's all possible with some simple science.

IMAGINATION PLAYGROUND



AGES 3+
NEW
ACTIVITY

CITY ART CENTRE

9.30AM-4.30PM | DROP-IN

Let your imagination run wild! Unlock your creative spirit and build magical, massive structures with our super-sized construction blocks in our Imagination Playground. What amazing structures will you make, and what will inspire your designs? Ideal for young engineers and adults alike.

OCEAN CONSTRUCTORS



AGES 5+
NEW
ACTIVITY

CITY ART CENTRE

9.30AM-4.30PM | DROP-IN

Join us on a journey of discovery into the depths of Earth's oceans in our new underwater construction zone. Build your own sea creatures, plants, submarines, aquatic robots and help us construct an amazing underwater landscape in Scotland's Year of Coasts and Waters.



CITY ART CENTRE



AGES 5+
WORKSHOP

SPLAT-TASTIC



CITY ART CENTRE

10AM-4PM [HALF HOURLY] | 20 MINS

BOOKING REQUIRED

Get your goo on in this interactive workshop. Be creative with chemistry and design your own slime to take home. 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.

Supported by



BLOOD BAR

AGES 7+
WORKSHOP



CITY ART CENTRE

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*.

ZOOM BOX

AGES 5+
ACTIVITY



CITY ART CENTRE

9.30AM-4.30PM | DROP-IN

Zoom in and get up close with the world around you! Use your smartphone camera with our special microscope tables to get a closer look at scientific samples. Plus, create your own Zoom Box and pair it up with your smartphone camera to make a microscope that you can take home.

BUZZ ABOUT BEES

AGES 5+
WORKSHOP



CITY ART CENTRE

10AM-4PM [HALF HOURLY] | 20 MINS

BOOKING REQUIRED

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.

WILD VETS

AGES 5+
WORKSHOP



CITY ART CENTRE

10AM-4PM [HALF HOURLY] | 45 MINS

BOOKING REQUIRED

Take on the role of an animal conservationist in our totally wild workshop. Discover more about Scottish wildlife heritage by exploring the animals that used to live here and the work being carried out to reintroduce animals - like the beaver - to Scotland.

AGES 5+
WORKSHOP

ENERGY MAKERS



CITY ART CENTRE

10AM-4PM [HOURLY] | 45 MINS

BOOKING REQUIRED

Discover the wonderful world of wind turbines! Learn how air can exert force and why the blades of a wind turbine spin. Get blown away by our awesome wind tunnel and chart the different speeds and directions of the wind. Finally, create your own turbines and test them in our tunnel in this great introduction to renewable energy.

Supported by



AGES 5+
WORKSHOP

LITTLE SPARKS



CITY ART CENTRE

10AM-4PM [HOURLY] | 45 MINS

BOOKING REQUIRED

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!

AGES 7+
NEW
WORKSHOP

CREATIVE CODING



CITY ART CENTRE

10AM-4PM [HOURLY] | 45 MINS

BOOKING REQUIRED

Introducing Marty - the dancing robot! Using the Scratch programming language, budding engineers can program Marty to follow commands and navigate around an obstacle course. Before you leave, get yourself a spot at the coolest party in town and make Marty dance at our robot disco.

CUBESAT CREATOR

AGES 7+
WORKSHOP



CITY ART CENTRE

10AM-4PM [HOURLY] | 45 MINS

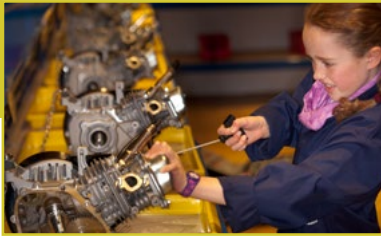
BOOKING REQUIRED

Ready, set, lift off! Come and build a CubeSat, a tiny satellite which can be used to carry out tasks in space. Decide what your device should include and what tasks it needs to undertake - then figure out the best place in space for your miniature machine to complete its mission.

MINI MECHANICS

AGES 7+

WORKSHOP



CITY ART CENTRE

10AM-4PM [HALF HOURLY] | 20 MINS

BOOKING REQUIRED

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. Stand back as we create a fire piston explosion and show how power is created through the magic of combustion.

ER SURGERY

AGES 8+

WORKSHOP



CITY ART CENTRE

10AM-4PM [HOURLY] | 45 MINS

BOOKING REQUIRED

Paging all surgeons to the emergency room - we need all hands on deck! Scrub up in the ER and help diagnose your 'patient', before performing life-saving surgery on the knee, abdomen and brain. Get involved using endoscopes supplied by Karl Storz - but be quick, every second counts. *Please note, this workshop is closed with no viewing area for parents.*



VIRTUAL WORLDS

AGES 10+

ACTIVITY



CITY ART CENTRE

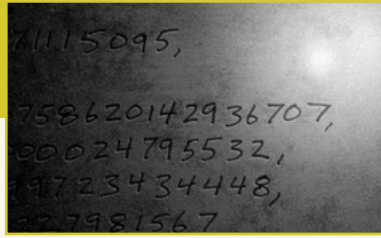
9.30AM-4.30PM | DROP-IN

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 to stand in the middle of a piece of art you just created? Get a taste for adventure just by popping on a headset.

SOMEWHERE IN THE UNIVERSE IT RAINS DIAMONDS

ALL AGES

NEW EXHIBITION



CITY ART CENTRE

9.30AM-4.30PM | DROP-IN

FREE WITH CITY ART CENTRE DAY PASS

Carbon is a basis of life but potentially the source of our demise. In its purest forms, carbon appears as both sparkling diamond and dull graphite. On Earth, graphite is far more common but, in the atmospheres of gas giants, carbon fuses into diamond raindrops, beautiful shards - valuable but deadly. A new work by Edinburgh based artist **Theodore Koterwas**, contrasts the romantic mystery of the cosmos with our tedious efforts to understand it. An Artificial Intelligence that was trained on the handwriting of astronomers tirelessly scrawls data from these wondrous stellar events onto a dusty wall of graphite. *Please note that City Art Centre is a family venue and as such adults are welcome to enjoy the exhibition while their children attend workshops and activities.*

Image: Theodore Koterwas



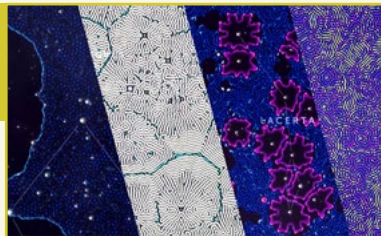
Scottish Government
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Developed with support from Creative Scotland through the Scottish Government's Festivals Expo Fund

YOU ARE HERE

ALL AGES

NEW EXHIBITION



CITY ART CENTRE

9.30AM-4.30PM | DROP-IN

FREE WITH CITY ART CENTRE DAY PASS

A magic window to the sky shows curious stars around the stately City Art Centre. When they sense a watcher, the heavens come alive! Seeded by the constellations, cellular algorithms evolve a carnival of colour and shape across the cosmos. The beguiling patterns, influenced by research from Alan Turing himself, sometimes evoke fingerprints, radio waves or even microscopic life. Created by **Ray Interactive**. *Please note that City Art Centre is a family venue and as such adults are welcome to enjoy the exhibition while their children attend workshops and activities.*

Image: Ray Interactive



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

RICOCHET

ALL AGES

NEW EXHIBITION



CITY ART CENTRE

9.30AM-4.30PM | DROP-IN

FREE WITH CITY ART CENTRE DAY PASS

Artist **Rachel McBriinn** presents a new video installation on deconstructed LCD monitors which you will discover on your way through the building. The polarising filters have been removed from the screens, which means that the video is invisible until you look through the filters and the image is revealed. This work asks us to think about how everyday digital devices are made and what elements need to come together to make something visible on screen. *Please note that City Art Centre is a family venue and as such adults are welcome to enjoy the exhibition while their children attend workshops and activities.*

Image: Rachel McBriinn



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

THE ELEMENTALISTS: WE ARE BUILDING A NEW WORLD

ALL AGES

NEW EXHIBITION



CITY ART CENTRE

9.30AM-4.30PM | DROP-IN

FREE WITH CITY ART CENTRE DAY PASS

In this exhibition Edinburgh-based artist **John Brown** explores his interest in creating images showing the optimistic use of the experiment and model making as processes to examine and understand the world. John's experience of working in an art college allows him many opportunities to see a constant turnover of experimentation through making by artists using a wide range of sources and materials and this has informed a lot of the imagery in this work. Using the idea of a periodic table and multiple paintings as a format he has imagined a group of people constructing and exploring individual elements that are components of a bigger picture. *Please note that City Art Centre is a family venue and as such adults are welcome to enjoy the exhibition while their children attend workshops and activities.*

Presented by City Art Centre

Image: John Brown

INTO THE BLUE



ALL AGES EXHIBITION

PORTOBELLO PROMENADE

DAILY | DROP-IN | WED 18 MARCH – MON 27 APRIL

FREE

Water covers 71% of the Earth's surface and the planet's oceans shape our environments and landscapes, influence our climate and weather systems, and have enabled the rise and fall of civilisations. They give us food and fuel, medicine and minerals, as well as leisure and pleasure. But their supply is finite or fragile, or both – under threat from pollution, global warming and acidification, over-fishing and biodiversity loss. And that's not to mention the threats they pose to us from rising sea levels!

Scotland has some of the most beautiful and diverse marine ecosystems in the world and, in celebration of Scotland's Year of Coasts and Waters, this large-scale outdoor photography exhibition will take you on a fascinating journey around some of Scotland's most remarkable coastlines. Revealing the beauty of coastal landscapes, introducing some of the weird and wonderful inhabitants of the world beneath the waves and exploring the role seas and oceans play in our lives *Into the Blue* is the story of our oceans' scale and majesty, their biodiversity and potential as well as the threats they face.

Images: David Bennett, Anna Deacon, David Gifford and Laurence Winram



EASTER TRAIL



ALL AGES ACTIVITY

ROYAL BOTANIC GARDEN EDINBURGH

JOHN HOPE GATEWAY

10AM–4PM | DROP-IN | ON UNTIL SUN 19 APRIL

£2 TICKETS ON THE DOOR ONLY

Follow the Botanic Bunny and learn about the elements together. You'll discover how the plants and animals in the garden interact with earth, air, fire and water. *Please dress appropriately for this outdoor event including sensible footwear and waterproof clothing.*

Presented by Royal Botanic Garden Edinburgh

SEABIRD CATAMARAN CRUISE

ALL AGES TOUR



SCOTTISH SEABIRD CENTRE | NORTH BERWICK

TIMES VARY | 75 MINS | DATES VARY

BOOKING THROUGH SCOTTISH SEABIRD CENTRE

Experience the wildlife wonders of Bass Rock, the world's largest northern gannet colony, from the water, on an hour-long cruise. The cruise departs from North Berwick Harbour and heads out to the Firth of Forth where you can see a range of amazing wildlife in its natural habitat. In April, the puffins are starting to return to Craighleith to nest and Bass Rock will be teeming with gannets. Other wildlife to spot include razorbills, guillemots, eider and cormorants. *Booking through seabird.org only.*

Presented by Scottish Seabird Centre



DESTINATION SPACE!

AGES 8+ ACTIVITY



DYNAMIC EARTH | STRATOSPHERE

10AM–4PM | DROP-IN | ON UNTIL THU 9 APRIL

FREE WITH ADMISSION

Blast off into space with an event that is truly out of this world. Explore the Universe through explosive demos, fun interactive activities and hands-on crafts. Discover how satellites can be used for everything from weather predictions, to GPS to tracking pirates. Explore the surface of Mars using LEGO® rovers and VR and even learn how space telescopes can see back in time using amazing infrared technology. Guaranteed to leave you feeling inspired by our incredible universe and the scientists who help uncover its secrets.

Presented by Dynamic Earth

BIO-DISCOVERIES

ALL AGES ACTIVITY



NATIONAL MUSEUM OF SCOTLAND

LEARNING CENTRE LEVEL 2

10AM–4.30PM | DROP-IN | ON UNTIL WED 8 APRIL

FREE

What do parasites look like up close? How can you tell a male and female mosquito apart and why does it matter? Join our biologists to find out what they've discovered about our living world and make some exciting discoveries for yourself under the microscope.

Presented by The University of Edinburgh

LIFE BEYOND OUR PLANET: DESIGN YOUR OWN ALIEN

ALL AGES ACTIVITY



NATIONAL MUSEUM OF SCOTLAND

LEARNING CENTRE LEVEL 2

10AM–4.30PM | DROP-IN | ON UNTIL WED 8 APRIL

FREE

Interested in the search for life beyond the Earth? Learn about the building blocks of life through our LEGO®-based astrobiology activity. Participants will build their own sequence of DNA and run it through our DNA sequencer to design an alien! It will be out of this world!

Presented by The University of Edinburgh

TWO SIDES OF THE SAME BRAIN

ALL AGES ACTIVITY



NATIONAL MUSEUM OF SCOTLAND

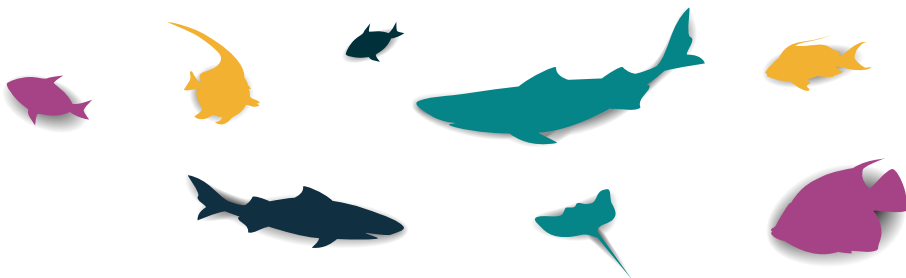
LEARNING CENTRE LEVEL 2

10AM–4.30PM | DROP-IN | ON UNTIL WED 8 APRIL

FREE

Do you know which part of your brain is more dominant and what this means for how you behave, use your hands and see the world? Through our range of simple interactive activities, quickly discover more about yourself – and brains in general – while also contributing to our science research project.

Presented by The University of Edinburgh



pale blue dot.

ALL AGES
EXHIBITION



NATIONAL MUSEUM OF SCOTLAND | GRAND GALLERY
10AM-5PM | DROP-IN | ON UNTIL SUN 19 APRIL | FREE

'Look again at that dot. That's here. That's home. That's us.'

CARL SAGAN

To celebrate Scotland's Year of Coasts and Waters, Edinburgh Science presents a brand-new interactive exhibition, *Pale Blue Dot*.

Dive head-first into our seas and oceans in this multi-sensory exploration of everything marine. Taking you through every layer of the ocean, *Pale Blue Dot* explores the vast, majesty and mystery of our seas. From amazing aquatic animals to incredible ecosystems, ocean bounty and intriguing research, find out what makes the underwater world so special and learn how we can protect one of the most precious habitats on Earth. *Pale Blue Dot* encourages you to explore your own relationship with the oceans and discover more about the waters that surround us.

Showcasing new and existing art from Scottish and international artists, **Marco Barotti, Hannah Imlach and Matthew Rimmer.**

Above image: Marco Barotti, below images: Hannah Imlach



TYRANNOSAURS

ALL AGES
EXHIBITION



NATIONAL MUSEUM OF SCOTLAND

EXHIBITION GALLERY 1, LEVEL 3

10AM-5PM | DROP-IN | ON UNTIL MON 4 MAY

SEE OUR WEBSITE FOR PRICES

Meet the most feared and revered of all dinosaurs in this cutting-edge exhibition, bringing the latest palaeontological discoveries to life. Explore the tyrannosaur family tree with life-size skeletons, rare fossils and incredible models. Through an augmented reality experience and large-scale projections, interact with dinosaurs in real time and even walk alongside them as they explore Edinburgh. *An exhibition created by the Australian Museum and toured internationally by Flying Fish.*

Presented by National Museums Scotland

ELEMENTAL

AGES 5+
SPECIAL EVENT



SUMMERHALL | MEET AT BOX OFFICE

11AM-6PM AND 11AM-9PM ON 7-9 APRIL ONLY

(PERFORMANCES EVERY 20 MINS)

30 MINS | LAST ENTRY 5.20PM AND 8.20PM (7-9 APRIL)

ON UNTIL SAT 11 APRIL | £5/£3

The Ancient Greeks saw the world comprised of four elements - earth, air, fire and water (with philosopher Aristotle throwing in a fifth, aether, for good measure) that were thought to explain the nature and complexity of all matter. Times have changed. We now have atomic theory, with atoms classified into more than a hundred chemical elements. Yet, echoes of the old theory reverberate to this day and scientists admit we still don't know everything. Interact with the elements on this magical multi-sensory journey of discovery through an intriguing, immersive digital world in which magic meets alchemy and alchemy meets science. Play, discover and create with your fellow explorers. *Suitable for 5+ and under 14s must be accompanied by an adult. Latecomers will not be admitted.*

Presented by Bright Side Studios in association with Edinburgh Science. Bright Side Studios connect the space between art and technology to create powerful human experiences. They specialise in designing immersive environments and installations that bring stories of all sorts to vibrant life. They have a passion for playing with illusion and visual wonderment to create emotional connections with their audience. brightsidestudios.co.uk.

Commissioned by Edinburgh Science



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

SUPPORTED BY
2020
COASTS
& WATERS

Crown Estate
Scotland
Oighearachd a' Ghruin Alba

Stantec

UNIVERSITY OF
STIRLING

Supported by the PLACE
(Platforms for Creative
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a partnership between
the Scottish Government
- through Creative
Scotland - the City of
Edinburgh Council and
the Edinburgh Festivals



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EDINBURGH
THE CITY OF EDINBURGH COUNCIL

CREATIVE
LAND
SCOT
ALBA | CHRUTHACHAL

HANDS-ON ROBOTS



ALL AGES
ACTIVITY

NATIONAL MUSEUM OF SCOTLAND

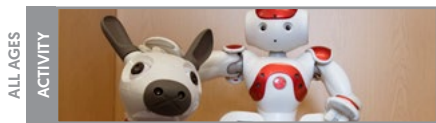
HAWTHORNDEN COURT

10AM-5PM | DROP-IN | ALSO ON SUN 5 APRIL | FREE

Meet the Arduino-powered, wheeled robots created and run by students from Edinburgh Napier University. Get hands-on with the machines of the future to find out all about the technology behind robots. A must for any future engineers (and their mums and dads).

Presented by Edinburgh Napier University

MARVELLOUS HEALTH ROBOTS



ALL AGES
ACTIVITY

NATIONAL MUSEUM OF SCOTLAND

HAWTHORNDEN COURT

10AM-5PM | DROP-IN | ALSO ON SUN 5 APRIL | FREE

Journey into the marvellous world of socially assistive robots! In recent years, the idea of robots assisting humans with their daily tasks has moved from the big screen and sci-fi novels to the real world and into our lives. Come and discover how small robots can be given big jobs in your home.

Presented by Edinburgh Centre for Robotics, Heriot-Watt University

HOLYROOD HERBAL HISTORIES



ALL AGES
TOUR

PALACE OF HOLYROODHOUSE

ABBAY STRAND AND PHYSIC GARDEN

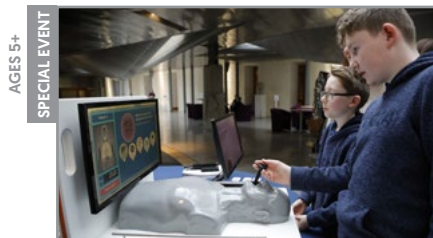
11AM AND 1.30PM | 1 HOUR | ON UNTIL SUN 19 APRIL

FREE BOOKING REQUIRED

Witness the newly re-created Physic Garden spring to life with tours and demonstrations exploring fantastic flowers and hundreds of years of herbs. Take a guided tour through the garden and hear about the fascinating properties of plants grown three centuries ago. Demonstrations after the tour will help you delve deep into the fascinating world of herbology, experiencing centuries of cures through textures, techniques and smells. Tickets include entry to the tour and demonstration. *Please dress appropriately for this outdoor event including sensible footwear and waterproof clothing.*

Presented by Royal Collection Trust

ADVENTURES IN SCIENCE



AGES 5+
SPECIAL EVENT

THE SCOTTISH PARLIAMENT

11AM-5PM | DROP-IN | ALSO ON SAT 18 APRIL | FREE

Join us at the iconic Scottish Parliament building for two family events that will offer an unrivalled adventure in science. Journey through earth, air, fire and water to discover the marvels of modern science through amazing hands-on activities, inspiring talks and creative learning for all. Held in the building responsible for legislating on many of the most pressing scientific and environmental issues we face, activities cover everything from the dazzling *Science is Magic* show; ideas on a sustainable future for planet Earth and the ever-popular Owl Magic display team. *For ages 5+.* Visit parliament.scot/science for more information.

Presented by The Scottish Parliament

ELEMENTARY BLUEPRINT



ALL AGES
EXHIBITION

STILLS CENTRE FOR PHOTOGRAPHY

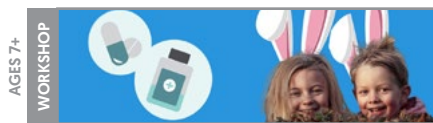
11AM-6PM | DROP-IN | ON UNTIL SUN 19 APRIL

FREE

Witness the results of a city-wide experiment that uses cyanotypes to produce a collaborative artwork that is created by the elements. Communities from across the city have faced the elements to create a unique picture of the city. Rain, sun, wind and atmospheric particles will saturate, expose and make marks, creating a blueprint of the city unseen by the human eye.

Presented by Stills Centre for Photography

MEDICINES IN THE MAKING



AGES 7+
WORKSHOP

NATIONAL MUSEUM OF SCOTLAND

LEARNING CENTRE LEVEL 4, STUDIO 1

11.30AM, 1.30PM AND 3PM | 45 MINS

ON UNTIL MON 6 APRIL | £5

The mysterious Easter Bunny Syndrome is spreading quickly around the world. Play our life-sized clinical-trial board game to help us find a treatment and to test out whether it works. While making your way across the board, you will learn what clinical trials are and how they help us develop new medicines. *For ages 7-12. Each ticket also admits one adult if required.*

Presented by The University of Edinburgh

GAME ON!



AGES 8+
WORKSHOP

NATIONAL MUSEUM OF SCOTLAND

LEARNING CENTRE LEVEL, 4 SEMINAR ROOM

11.45AM AND 2.45PM | 50 MINS

ON UNTIL WED 8 APRIL | £5

A hands-on, playful introduction to computer programming. You'll explore the exciting world of video games, learn the basics of coding in a visual programming language called Scratch and you'll design and build your very own computer game! *For ages 8-14. Each ticket admits one adult if required.*

Presented by The University of Edinburgh

WATERWALL



ALL AGES
ACTIVITY

ROYAL BOTANIC GARDEN EDINBURGH

JOHN HOPE GATEWAY

12PM-4PM | DROP-IN | ON UNTIL THU 9 APRIL | FREE

What story would you tell about our coasts and waters? Tell us in pictures! Bring along photographs to tell your story or use the photographs provided. Your contributions will form *Waterwalls* - a collaborative understanding of Scotland's coasts and waters told through the stories of those who experience them. Your creation will then be reviewed by a research team and made available for viewing online.

Presented by Royal Botanic Garden Edinburgh

STREET SCIENCE



ALL AGES
ACTIVITY

AROUND EDINBURGH

TIMES VARY | DROP-IN | DATES VARY | FREE

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 in the run up to and during the Science Festival. *Follow us on Twitter @EdSciFest for real-time updates.*

Supported by



ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
| P.46 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
| P.47 | PALE BLUE DOT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.47 | TYRANNOSAURS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | ELEMENTARY BLUEPRINT 11AM-6PM STILLS CENTRE FOR PHOTOGRAPHY |

RECURRING EVENTS

| | |
|------|--|
| P.46 | EASTER TRAIL 10AM-4PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.46 | DESTINATION SPACE 10AM-4PM DYNAMIC EARTH |
| P.46 | BIO-DISCOVERIES 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.46 | LIFE BEYOND OUR PLANET 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.46 | TWO SIDES OF THE SAME BRAIN 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | HANDS-ON ROBOTS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | MARVELLOUS HEALTH ROBOTS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.47 | ELEMENTAL 11AM-6PM SUMMERHALL |
| P.48 | HOLYROOD HERBAL HISTORIES 11AM AND 1.30PM PALACE OF HOLYROODHOUSE |
| P.48 | MEDICINES IN THE MAKING 11.30AM, 1.30PM AND 3PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | GAME ON! 11.45AM AND 2.45PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | WATERWALL 12PM-4PM ROYAL BOTANIC GARDEN EDINBURGH |

SUNDAY
5
APRIL

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
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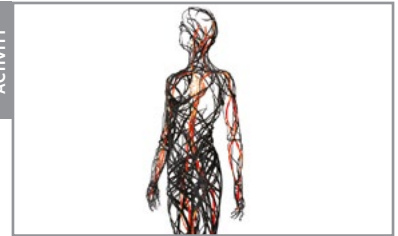
RECURRING EVENTS

| | |
|---------|--|
| P.42-45 | 9.30AM-4.30PM CITY ART CENTRE 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. |
| P.46 | EASTER TRAIL 10AM-4PM ROYAL BOTANIC GARDEN EDINBURGH |
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| P.48 | GAME ON! 11.45AM AND 2.45PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | WATERWALL 12PM-4PM ROYAL BOTANIC GARDEN EDINBURGH |

MONDAY
6
APRIL

IT'S ALL CONNECTED

ALL AGES
ACTIVITY



NATIONAL MUSEUM OF SCOTLAND

HAWTHORNDEN COURT

10AM-5PM | DROP-IN | ON UNTIL FRI 10 APRIL | FREE

Visit British Heart Foundation Scotland's glowing human LED sculpture to see how all heart and circulatory diseases are connected. Conditions like heart disease, stroke, and vascular dementia all occur when your blood is not flowing properly. That's why research starts with the heart! Discover how the cardiovascular system works through research based on the elementary factors of earth, air, fire, water and aether.

Supported by



DESIGNER MALARIA VACCINES

ALL AGES
ACTIVITY



NATIONAL MUSEUM OF SCOTLAND

HAWTHORNDEN COURT

10AM-5PM | DROP-IN | ON UNTIL WED 8 APRIL | FREE

Malaria is one of the deadliest human diseases, killing a child in Africa every few minutes. We urgently need a vaccine, but the parasite is a master at hiding from our defences. Now there's been a breakthrough, as a team at the University of Oxford designed new molecules that could be used in the world's first highly effective malaria vaccines. Join us to find out more about the science that could help us fight back.

Presented by the University of Oxford

WIND AND FIRE

ALL AGES
ACTIVITY



NATIONAL MUSEUM OF FLIGHT

CONCORDE HANGAR

12PM-4PM | DROP-IN | ON UNTIL MON 13 APRIL

FREE WITH ADMISSION

Discover the technology and impact of the jet engine. From an ancient Greek philosopher to the 1930s and beyond, jet engines have changed the way we travel. Come and discover how they work and use examples from the museum's nationally-important collection to explore the ways in which they have changed and developed. Then put your own knowledge to the test and make your own air-driven vehicle in a family technical challenge.

Presented by the National Museum of Flight

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
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RECURRING EVENTS

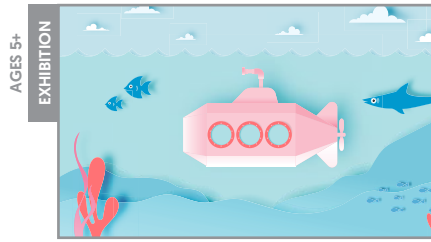


P.42-45
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| P.46 | TWO SIDES OF THE SAME BRAIN 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.49 | IT'S ALL CONNECTED 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.49 | DESIGNER MALARIA VACCINES 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.47 | ELEMENTAL 11AM-9PM SUMMERHALL |
| P.48 | HOLYROOD HERBAL HISTORIES 11AM AND 1.30PM PALACE OF HOLYROODHOUSE |
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| P.48 | WATERWALL 12PM-4PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.49 | WIND AND FIRE 12PM-4PM NATIONAL MUSEUM OF FLIGHT |

7 APRIL

AUTISM-FRIENDLY SESSIONS: PALE BLUE DOT



AGES 5+

NATIONAL MUSEUM OF SCOTLAND

GRAND GALLERY
9AM | 1 HOUR | ALSO ON THU 9 APRIL
FREE BOOKING REQUIRED
RP RELAXED PERFORMANCE

To provide an accessible environment to members of the autistic community we are hosting an early doors session at the National Museum of Scotland for *Pale Blue Dot* (p.47). Presented in partnership by National Museums Scotland and Edinburgh Science
Imgae: Hannah Imlach

POUNDS AND PENCE: SCIENCE IN YOUR POCKET



AGES 8+

MUSEUM ON THE MOUND

10AM-4PM (HOURLY NOT 1PM) ON TUES-FRI
1PM-4PM (HOURLY) ON SAT | 50 MINS
ON UNTIL SAT 18 APRIL (NOT SUN OR MON)
FREE BOOKING REQUIRED

Billions of coins and millions of notes circulate daily but rarely receive the scrutiny they deserve. In two special workshops, magnifiers and money-checkers will play their part in revealing the secrets behind the cash we handle every day. Lloyds Banking Group's Museum on the Mound in Edinburgh and the Royal Mint Museum near Cardiff are teaming up to put money under the microscope. See our website for more information about the workshops.
Presented by Museum on the Mound and the Royal Mint Museum

AMAZING PLASTIC



AGES 10+

ROYAL BOTANIC GARDEN EDINBURGH

PATRICK GEDDES ROOM
10.30AM AND 2PM | 90 MINS | FREE BOOKING REQUIRED
Plastic is amazing when used correctly! Artist Carol Sinclair shows how we can reuse plastic to enjoy its wonderful properties. In this hands-on making workshop you will transform plastic waste into clouds and trees to create your own environmental balance mobile. A creative reminder that materials are precious and deserve reuse! This event is linked to the exhibition *Think Plastic: Materials and Making*.
Presented by Royal Botanic Garden Edinburgh

PLANET PONG AND THE STINKY SONG



AGES 4+

ROYAL BOTANIC GARDEN EDINBURGH

FOREST ROOM, FLETCHER BUILDING
11AM, 12PM, 1.30PM, 2.30PM AND 3.30PM | 25 MINS
ON UNTIL THU 9 APRIL | FREE BOOKING REQUIRED

When planet Earth gets too stinky, the rubbish puppets seek help from Earthlings to clean up the mess. Can we make it in time to make a difference? This show is presented in association with The University of Edinburgh and is linked to the exhibition *Think Plastic: Materials and Making*.
Presented by Royal Botanic Garden Edinburgh

AMAZING IMMUNOLOGY: BE A SCIENTIST. BUILD A VACCINE!



AGES 7+

NATIONAL MUSEUM OF SCOTLAND

LEARNING CENTRE LEVEL 4, STUDIO 1
12PM | 50 MINS | ON UNTIL FRI 10 APRIL | £5

Become a scientist and learn how your immune system detects and destroys bugs, and how vaccines trigger the immune system and its memory to protect us from deadly diseases. Take part and build your own vaccine to halt a nasty virus. For ages 7-13. Each ticket admits one adult if required.
Presented by The University of Edinburgh

ELEMENTS IN THE PARK



WORKSHOP

MEET AT HOLYROOD PARK INFORMATION CENTRE

1PM | UP TO 3 HOURS
ALSO ON SAT 11, TUE 14 AND SAT 18 APRIL
FREE BOOKING REQUIRED

Holyrood Park's dramatic hills and crags have been shaped by the elements. Join Historic Environment Scotland's rangers and experts to explore how earth, air, fire and water have influenced the natural landscape and its inhabitants for thousands of years. Tuesday 14 and Saturday 18 April sessions are designed to appeal to families and children aged 8+. Tuesday 7 and Saturday 11 April sessions are suitable for ages 14+. Please dress appropriately for this outdoor event including sensible footwear and waterproof clothing.
Presented by Historic Environment Scotland

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
| P.46 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
| P.47 | PALE BLUE DOT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.47 | TYRANNOSAURS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | ELEMENTARY BLUEPRINT 11AM-6PM STILLS CENTRE FOR PHOTOGRAPHY |

RECURRING EVENTS



P.42-45

9.30AM-4.30PM | CITY ART CENTRE
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.

| | |
|------|---|
| P.46 | EASTER TRAIL 10AM-4PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.46 | DESTINATION SPACE 10AM-4PM DYNAMIC EARTH |
| P.50 | POUNDS AND PENCE: SCIENCE IN YOUR POCKET 10AM-4PM MUSEUM ON THE MOUND |
| P.46 | BIO-DISCOVERIES 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.46 | LIFE BEYOND OUR PLANET 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.46 | TWO SIDES OF THE SAME BRAIN 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.49 | IT'S ALL CONNECTED 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.49 | DESIGNER MALARIA VACCINES 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.47 | ELEMENTAL 11AM-9PM SUMMERHALL |
| P.48 | HOLYROOD HERBAL HISTORIES 11AM AND 1.30PM PALACE OF HOLYROODHOUSE |
| P.50 | PLANET PONG 11AM, 12PM, 1.30PM, 2.30PM AND 3.30PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.48 | GAME ON! 11.45AM AND 2.45PM NATIONAL MUSEUM OF SCOTLAND |
| P.50 | AMAZING IMMUNOLOGY 12PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | WATERWALL 12PM-4PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.49 | WIND AND FIRE 12PM-4PM NATIONAL MUSEUM OF FLIGHT |

SEASHORE SAFARI



ALL AGES
WORKSHOP

PORTOBELLO | JOPPA SANDS
MEET AT GRASS WEST OF ROCKVILLE HOTEL
10AM | 2 HOURS | FREE BOOKING REQUIRED
Join biologists from the Marine Conservation Society as we explore Edinburgh's rocky shore and discover what lives there. *Please dress appropriately for this outdoor event including sensible footwear and waterproof clothing.*
Presented by Marine Conservation Society



LET'S LOOK AT THE HEART



AGES 10+
WORKSHOP

SURGEONS' HALL MUSEUMS
11AM AND 1PM | 1 HOUR | ALSO ON WED 15 APRIL | £7
Dissect a real pig's heart and discover more about an incredible organ in this hands-on workshop. Learn the journey that blood takes around your heart and tug on some real heart strings to find out what causes heart attacks. *Each ticket admits one accompanying adult who must attend but is not required to participate.*
Presented by Surgeons' Hall Museums



It's time to call in the in-laws or book that babysitter and head out for a night without the kids.

Each year the Science Festival's programme of events for adults and young people grows and in 2020, we have a huge selection of events perfect for parents with a night off.

Whether you fancy a romantic night under the shadow of planet Earth, a chance to explore your hidden hobbies, a delicious taster of snacks and treats, or a friend-filled night out at one of our fact or fiction quizzes - the Science Festival's got your child-free night covered!

Here are our top picks, but browse the full programme for plenty more options.

| | |
|------|---|
| P.22 | STRANGER THAN FICTION PANEL GAME 7.30PM 13 APRIL PLEASANCE |
| P.28 | JUKEBOX BINGO 8PM 15 APRIL PLEASANCE |
| P.30 | AN EVENING WITH GAIA 7PM 16 APRIL DYNAMIC EARTH |
| P.31 | UNIVER-SILLY CHALLENGED 8PM 16 APRIL PLEASANCE |
| P.35 | CODING FOR GROWN UPS 2PM AND 6PM 18 APRIL PLEASANCE |
| P.37 | OUT THINKERS 8PM 18 APRIL PLEASANCE |

Search our website for more event suggestions.



WHEELLEY

WATT

8

WEDNESDAY

APRIL

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------------------|--|
| P.46 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
| P.47 | PALE BLUE DOT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.47 | TYRANNOSAURS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | ELEMENTARY BLUEPRINT 11AM-6PM STILLS CENTRE FOR PHOTOGRAPHY |
| RECURRING EVENTS | |
| P.50 | AUTISM-FRIENDLY SESSIONS: PALE BLUE DOT 9AM NATIONAL MUSEUM OF SCOTLAND |
| P.42-45 | 9.30AM-4.30PM CITY ART CENTRE 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. |
| P.46 | EASTER TRAIL 10AM-4PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.46 | DESTINATION SPACE 10AM-4PM DYNAMIC EARTH |
| P.50 | POUNDS AND PENCE: SCIENCE IN YOUR POCKET 10AM-4PM MUSEUM ON THE MOUND |
| P.49 | IT'S ALL CONNECTED 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.47 | ELEMENTAL 11AM-9PM SUMMERHALL |
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| P.50 | PLANET PONG 11AM, 12PM, 1.30PM, 2.30PM AND 3.30PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.50 | AMAZING IMMUNOLOGY 12PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | WATERWALL 12PM-4PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.49 | WIND AND FIRE 12PM-4PM NATIONAL MUSEUM OF FLIGHT |

9 APRIL

CHEMISTRY OF OUR PLANET

ALL AGES
ACTIVITY

NATIONAL MUSEUM OF SCOTLAND

LEARNING CENTRE LEVEL 2

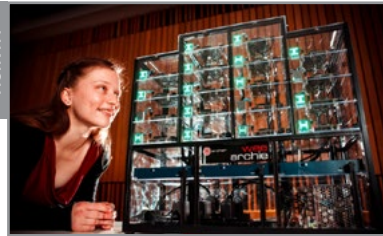
10AM-4.30PM | DROP-IN | ON UNTIL MON 13 APRIL

FREE

From air pollution to sustainable energy sources, find out about amazing sustainable chemistry with hands-on activities centred on the four ancient classifications of earth, air, fire and water. Come and learn about our planet and how we, as chemists, will protect it.

Presented by The University of Edinburgh

MODELLING THE WORLD WITH SUPERCOMPUTERS

ALL AGES
ACTIVITY

NATIONAL MUSEUM OF SCOTLAND

LEARNING CENTRE LEVEL 2

10AM-4.30PM | DROP-IN | ON UNTIL MON 13 APRIL

FREE

As part of Scotland's Year of Coast and Waters, use a Raspberry Pi model-supercomputer to experiment with coastal sea defences and reduce the impact of storm waves on a seaside town. How well can you protect the town and coast? Learn how computer scientists support other researchers and engineers in modelling the world around us.

Presented by The University of Edinburgh

FRUIT FLIES: A KEY TO UNLOCK HUMAN MYSTERIES

ALL AGES
ACTIVITY

NATIONAL MUSEUM OF SCOTLAND

LEARNING CENTRE LEVEL 2

10AM-4.30PM | DROP-IN | ALSO ON FRI 10 APRIL

FREE

Get hands-on with live fruit flies, use a microscope to identify their body parts and use glow-in-the-dark organs to see what's going on inside! Find out how our techniques contribute to scientific progress and discuss the latest research with biomedical researchers.

Presented by The University of Edinburgh

BRAINS!

ALL AGES
ACTIVITY

NATIONAL MUSEUM OF SCOTLAND

LEARNING CENTRE LEVEL 2

10AM-4.30PM | DROP-IN | ALSO ON FRI 10 APRIL

FREE

What is your brain made of and how do we find out how it works? Join us for an interactive look at real brains and find out about how researchers use donated human brain tissue to better understand human disease. Discuss the latest research techniques with medical researchers.

Presented by The University of Edinburgh

MAKING CIRCLES

AGES 10+
WORKSHOP

NATIONAL MUSEUM OF SCOTLAND

LEARNING CENTRE LEVEL 4, SEMINAR ROOM

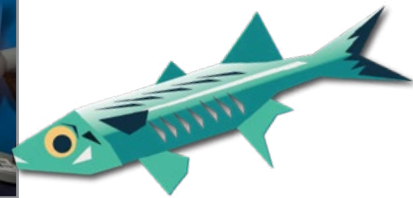
11AM AND 2PM | 1 HOUR | ALSO ON FRI 10 APRIL

£6 OR £5 EACH FOR 3 OR MORE TICKETS

Design and create your own object for a Zero Waste classroom! Use a range of inspiring materials, including brand new resources that were destined for landfill and learn about how waste can be transformed into something amazing. Let's make better use of the world's resources, together.

Presented by Ostrero

Supported by



NEURON SAFARI

AGES 7+
WORKSHOP



NATIONAL MUSEUM OF SCOTLAND

LEARNING CENTRE FOYER, LEVEL 4
11AM-4PM (HALF HOURLY) | 20 MINS
ALSO ON FRI 10 APRIL

FREE SIGN UP ON THE DAY ON LEVEL 2

Explore how the billions of cells in your brain work through Minecraft! Get involved and learn about the incredible machinery that makes our cells work. You'll be able to make proteins from DNA and learn how our neurons communicate with one another. *For ages 7+.*
Presented by The University of Edinburgh

SEASHORE NATURE DETECTIVES

ALL AGES
WORKSHOP



FISHERROW HARBOUR | MUSSELBURGH SCOTTISH SEABIRD CENTRE | NORTH BERWICK

2PM | 2 HOURS

THU 9 AT FISHERROW HARBOUR

FRI 10 AT SCOTTISH SEABIRD CENTRE

£6 OR £5 EACH FOR 3 OR MORE TICKETS

Join naturalist and wildlife tracker **Dan Puplett** for an exploration of our amazing coast. Look for tracks, signs and other clues left behind by wildlife as well as getting to know the incredible diversity of life on the seashore from birds to barnacles! Explore some fun ways to sharpen your senses and hone your nature detective skills, as well as finding out more about how to help our coastal wildlife. *Please dress appropriately for this outdoor event including sensible footwear and waterproof clothing.*

Presented by Dan Puplett Nature Awareness



ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
| P.46 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
| P.47 | PALE BLUE DOT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.47 | TYRANNOSAURS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
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| P.52 | CHEMISTRY OF OUR PLANET 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.52 | MODELLING THE WORLD WITH SUPERCOMUTERS 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.52 | FRUIT FLIES: A KEY TO UNLOCK HUMAN MYSTERIES 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.52 | BRAINS! 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.49 | IT'S ALL CONNECTED 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.47 | ELEMENTAL 11AM-6PM SUMMERHALL |
| P.48 | HOLYROOD HERBAL HISTORIES 11AM AND 1.30PM PALACE OF HOLYROODHOUSE |
| P.52 | MAKING CIRCLES 11AM AND 2PM NATIONAL MUSEUM OF SCOTLAND |
| P.53 | NEURON SAFARI 11AM-4PM NATIONAL MUSEUM OF SCOTLAND |
| P.50 | AMAZING IMMUNOLOGY 12PM NATIONAL MUSEUM OF SCOTLAND |
| P.49 | WIND AND FIRE 12PM-4PM NATIONAL MUSEUM OF FLIGHT |
| P.53 | SEASHORE NATURE DETECTIVES 2PM SCOTTISH SEABIRD CENTRE |

EARTH FROM ABOVE

ALL AGES
ACTIVITY



DYNAMIC EARTH | STRATOSPHERE

10AM-4PM | DROP-IN | ALSO ON SAT 11 APRIL

FREE WITH ADMISSION

Get involved with exciting activities that explore how satellites are launched into orbit and see real images of our planet taken from thousands of kilometres away before learning how we can use these to better understand some of Earth's problems. **Dr Murray Collins** and his team of scientists will be on hand to show how their research is changing the way that we monitor our fragile ecosystems by looking at Earth from space!

Presented by Dynamic Earth

ROCKPOOL RAMBLES

ALL AGES
ACTIVITY



SCOTTISH SEABIRD CENTRE | NORTH BERWICK

11AM | 90 MINS | ON UNTIL SUN 12 APRIL

£7/£4 BOOKING REQUIRED

Discover the amazing wildlife that can be found in the rockpools of North Berwick. Enjoy a brief talk followed by a guided ramble along the nearby rocky shore. You'll be amazed by the variety of life and the different adaptations of the creatures you meet. Plus, receive discounted entry into the Scottish Seabird Centre after the event! *Under 16s must be accompanied by an adult. Please dress appropriately for this outdoor event including sensible footwear and waterproof clothing.*

Presented by the Scottish Seabird Centre



FRANKENSTEIN'S PLANTS

ALL AGES
ACTIVITY



ROYAL BOTANIC GARDEN EDINBURGH

JOHN HOPE GATEWAY

12PM-4PM | DROP-IN | ON UNTIL SUN 12 APRIL | FREE

Join the Royal Botanic Garden Edinburgh science team to create a completely unique specimen from the pressed plants provided and upload it to a digital herbarium. You'll discover why plant specimens and digital images are so important for research and how scientists use the estimated three million plant specimens in the collection.

Presented by Royal Botanic Garden Edinburgh



10 APRIL

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
| P.46 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
| P.47 | PALE BLUE DOT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.47 | TYRANNOSAURS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | ELEMENTARY BLUEPRINT 11AM-6PM STILLS CENTRE FOR PHOTOGRAPHY |

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| P.53 | EARTH FROM ABOVE 10AM-4PM DYNAMIC EARTH |
| P.52 | CHEMISTRY OF OUR PLANET 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.52 | MODELLING THE WORLD WITH SUPERCOMUTERS 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.47 | ELEMENTAL 11AM-6PM SUMMERHALL |
| P.53 | ROCKPOOL RAMBLES 11AM SCOTTISH SEABIRD CENTRE |
| P.48 | HOLYROOD HERBAL HISTORIES 11AM AND 1.30PM PALACE OF HOLYROODHOUSE |
| P.53 | FRANKENSTEIN'S PLANTS 12PM-4PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.49 | WIND AND FIRE 12PM-4PM NATIONAL MUSEUM OF FLIGHT |
| P.50 | ELEMENTS IN THE PARK 1PM HOLYROOD PARK INFORMATION CENTRE |
| P.50 | POUNDS AND PENCE: SCIENCE IN YOUR POCKET 1PM-4PM MUSEUM ON THE MOUND |



VENUE SPONSOR

ALL AGES
SPECIAL EVENT

PLEASANCE

10AM-1PM AND 2PM-5PM (NOT 1PM-2PM) | DROP-IN | ALSO ON SUN 12 APRIL | £6/£3 UNDER 5S INCLUDES A SHOW
Travel back in time and discover the Pleasance overrun by dinosaurs! Join dino-devotee **Jules Howard** for his fantastic new show *Prehistoric Beasts and How to Know Them* and create masks, hats and other stylish dino-accessories in one of our drop-in activities. Rampage around the courtyard on a reptilian egg hunt and join our friends from Dynamic Earth to dig for fossils. There's plenty to keep little paleontologists busy at our Easter weekend dinosaur spectacular!



CRETACEOUS CRAFTS

ALL AGES
ACTIVITY

You can make masks, you can make finger puppets, you can make prints! Because *Dinosaur Weekend* will be packed to the rafters with dino-themed crafts. You'll need your human hands when you arrive to make lots of roarsome accessories, but you'll leave feeling more like a prehistoric reptile than ever before.

DINO'S ON THE ROAD

AGES 5+
ACTIVITY

How long ago were the dinosaurs on Earth? What might have caused their extinction? Join the team from Dynamic Earth's kids club, Dino's, and become fossil detectives. Explore the rich diversity of dinosaurs by investigating handling specimens including T-rex teeth, Stegosaurus back plates and real Sauropod dung!
Presented by Dynamic Earth

JURASSIC PLAYGROUND

ALL AGES
ACTIVITY

Join us for a selection of prehistoric tomfoolery with a range of dino-themed games and activities! From hoopla to disco dancing, channel your inner playful Plesiosaur and see which T-rex comes out on top!

TRIASSIC TRAIL

ALL AGES
ACTIVITY

We're going on an dino-egg hunt! Back in prehistoric times, before the Easter Bunny was born, everyone was visited by the Easter Baryonyx. And she's left eggs all over Pleasance! Can you help us track them all down?

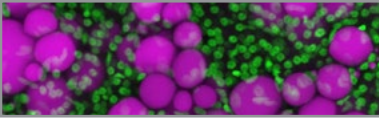
AGES 5+
SHOW

10.30AM, 11.45AM, 2.30PM AND 3.45PM | 45 MINS
Join fossil-hunter, author and presenter **Jules Howard** in a time-travelling extravaganza through the age of dinosaurs. Showcasing the very latest in palaeontology, there will be real-life fossils, a spectacular show-and-tell and, of course, plenty of fossilised poo. You'll even get to take home your own sample of 150 million-year-old rock, complete with fossil ammonites and other prehistoric creatures.

11 APRIL

BODY IMAGE: A TECHNOLOGICAL TOUR OF THE BODY

ALL AGES
ACTIVITY



NATIONAL MUSEUM OF SCOTLAND

LEARNING CENTRE LEVEL 2

10AM–4.30PM | DROP-IN | ON UNTIL MON 13 APRIL

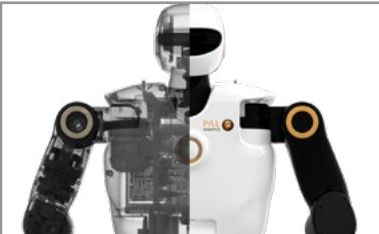
FREE

Get hands-on with medical researchers to find out how new technologies are advancing the way we understand and see inside the body. Use cutting-edge imaging techniques to uncover body mysteries, run experiments to discover if whales are stressed and explore ways that body fat can be healthy!

Presented by The University of Edinburgh

THE TALOS HUMANOID ROBOT SHOWCASE

ALL AGES
ACTIVITY



NATIONAL MUSEUM OF SCOTLAND

HAWTHORNDEN COURT

10AM–5PM | DROP-IN | ALSO ON SUN 12 APRIL

FREE

Meet Talos, a six-foot-tall humanoid robot and the newest addition to the robotics research lab at The University of Edinburgh. Talk with the team behind this innovative technology and find out how researchers are using Talos to study walking, balancing, using tools, sensing the world, as well as how robots employ machine learning to adapt to the ever-changing worlds around them.

Presented by The University of Edinburgh

SEEING THE HIDDEN ENVIRONMENT

ALL AGES
ACTIVITY



NATIONAL MUSEUM OF SCOTLAND

HAWTHORNDEN COURT

10AM–5PM | DROP-IN | ALSO ON SUN 12 APRIL

FREE

Discover how robots work in extreme environments with the ORCA Hub and Royal Academy of Engineering Ingenious: *Robosense* project. Interact, program and play with Cozmo robots in our hands-on arena and then see how our Husky robot compares doing real-life tasks. Learn how the *Robosense* project is helping local school pupils learn to code and explore their surroundings using our extreme environmental sensors.

Presented by The University of Edinburgh

THE ROBOTARIUM

ALL AGES
ACTIVITY



NATIONAL MUSEUM OF SCOTLAND

HAWTHORNDEN COURT

10AM–5PM | DROP-IN | ALSO ON SUN 12 APRIL

FREE

Join Edinburgh Centre for Robotics and discover how robots are attempting to understand and mimic human behaviours. There's lots to explore – from a collaborative robot that wants to work with you to toy robots that can be programmed and driven around. For those wanting more behind-the-scenes details, current robotics researchers will be on-hand to discuss the latest developments and possible implications for wider society.

Presented by The University of Edinburgh

DANCE CONSTELLATIONS

AGES 7+
WORKSHOP



COLLECTIVE

10.30AM | 2 HOURS | ALSO ON SUN 12 APRIL | £4

Responding to Julijonas Urbonas' exhibition, *Planet of People*, at Collective, you'll be inspired to get your body moving and shaking in this interactive dance workshop. You'll begin with imagining how the body might move and dance in outer space, before working through a wide constellation of movement themes. *The session will end with a short performance for parents and carers. No experience necessary and please wear what makes you feel comfortable. Each ticket admits one accompanying adult who must attend but is not required to participate.*

Presented by Collective

ZOO ECO-DETECTIVES

ALL AGES
ACTIVITY



EDINBURGH ZOO

11AM–4PM | DROP-IN | FREE WITH ADMISSION

Grab your hat and spyglass and join the detective trail following clues pointing towards sustainable innovations around Edinburgh Zoo. Explore the five elements of waste, energy, water, biodiversity and food as you go, and uncover sustainable tips and eco-tricks to take home.

Presented by Edinburgh Zoo



GET CREATIVE WITH DIGITAL TECHNOLOGY

CYBER ZONE

AGES 8+

This year we've packed all of our tech workshops in one immersive *Cyber Zone* at Pleasance, with activities to suit all ages and abilities. From soldering and gaming to hacking and code cracking, the digital world has never been so cool. Full programme p.21.



ELEMENTAL

AGES 5+

A magical multi-sensory journey of discovery through an immersive digital landscape. Play, discover and create the elements with your fellow explorers at Summerhall. Presented by Bright Side Studios and Edinburgh Science. Full details p.47.



Scottish Government
Riaghaltas na h-Alba
gov.scot

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

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------------------|---|
| P.46 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
| P.47 | PALE BLUE DOT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.47 | TYRANNOSAURS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | ELEMENTARY BLUEPRINT 11AM-6PM STILLS CENTRE FOR PHOTOGRAPHY |
| RECURRING EVENTS | |
| P.46 | EASTER TRAIL 10AM-4PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.52 | CHEMISTRY OF OUR PLANET 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.52 | MODELLING THE WORLD WITH SUPERCOMUTERS 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.55 | BODY IMAGE: A TECHNICAL TOUR OF THE BODY 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.54 | DINOSAUR WEEKEND 10AM-5PM PLEASANCE |
| P.55 | THE TALOS HUMANOID ROBOT SHOWCASE 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.55 | SEEING THE HIDDEN ENVIRONMENT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.55 | THE ROBOTARIUM 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.55 | DANCE CONSTELLATIONS 10.30AM COLLECTIVE |
| P.53 | ROCKPOOL RAMBLES 11AM SCOTTISH SEABIRD CENTRE |
| P.48 | HOLYROOD HERBAL HISTORIES 11AM AND 1.30PM PALACE OF HOLYROODHOUSE |
| P.53 | FRANKENSTEIN'S PLANTS 12PM-4PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.49 | WIND AND FIRE 12PM-4PM NATIONAL MUSEUM OF FLIGHT |

ATLANTIC ADVENTURES WITH ATLAS

ALL AGES
ACTIVITY

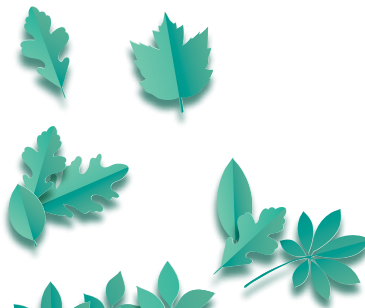


DYNAMIC EARTH | STRATOSPHERE

10AM-4PM | DROP-IN | ALSO ON MON 13 APRIL
FREE WITH ADMISSION

Dive into the deep and discover the creatures that lurk at the bottom of the ocean by piloting a virtual underwater robot, or going on a VR expedition to the Arctic. Show off your design skills by taking our LEGO® challenge and get creative with amazing augmented reality crafts. Showcasing the research of ATLAS, an EU funded project investigating the Atlantic Ocean, you'll be amazed at the incredible life found in the deep.

Presented by Dynamic Earth



12
APRIL

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------------------|--|
| P.46 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
| P.47 | PALE BLUE DOT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
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| P.42-45 | 9.30AM-4.30PM CITY ART CENTRE 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. |
| P.46 | EASTER TRAIL 10AM-4PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.56 | ATLANTIC ADVENTURES WITH ATLAS 10AM-4PM DYNAMIC EARTH |
| P.52 | CHEMISTRY OF OUR PLANET 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.52 | MODELLING THE WORLD WITH SUPERCOMUTERS 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.55 | BODY IMAGE: A TECHNICAL TOUR OF THE BODY 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | HOLYROOD HERBAL HISTORIES 11AM AND 1.30PM PALACE OF HOLYROODHOUSE |
| P.49 | WIND AND FIRE 12PM-4PM NATIONAL MUSEUM OF FLIGHT |

13
APRIL

HERITAGE ROCKS

ALL AGES
ACTIVITY



NATIONAL MUSEUM OF SCOTLAND

HAWTHORNDEN COURT

10AM-5PM | DROP-IN | ON UNTIL WED 15 APRIL | FREE

Join the Historic Environment Scotland experts to learn how through science and technology we can better understand, protect and conserve our cultural heritage. Enjoy fun and engaging hands-on sessions to forensically discover how the Earth has been used to support human activity, enabling our understanding of history and creating special places.

Presented by Historic Environment Scotland

CYBER ZONE

GADGET FACTORY

WORKSHOP



PLEASANCE | OCHIL ROOM

10AM, 11.30AM, 1.30PM AND 3PM | 45 MINS

ALSO ON TUE 14 APRIL | £8

Investigate and explore how circuits work in all sorts of different electronics. Get to grips with soldering and in no time you'll have a trendy wearable gadget to take home! *For more Cyber Zone events perfect for young adults and grown ups see p.21.*

CYBER ZONE

ELECTRONIC MUSIC: BEGINNERS

WORKSHOP



PLEASANCE | PENTLAND ROOM

11AM AND 2PM | 90 MINS | £15

Find out how electronic circuits make sounds and build your own. You'll learn how to solder components to a small circuit board which is shaped like bagpipes. When the circuit is complete, your gadget will be able to play a tune! *No previous experience required. For more Cyber Zone events perfect for young adults and grown ups see p.21.*

Presented by MadLab Ltd

EXPERIMENTARIUM

VENUE SPONSOR



CIRRUS LOGIC®

ADMIT ONE
ALL THIS
SCIENCE FUN
UNDER ONE
ROOF!

ALL AGES
SPECIAL EVENT



PLEASANCE | QUAKER STUDIO

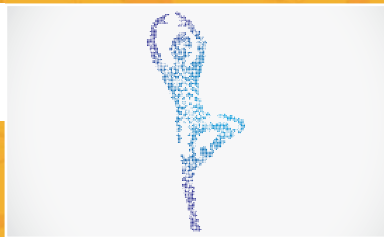
11AM-4PM (MON-THUR) AND 10AM-1PM (FRI) | ON UNTIL FRI 17 APRIL | DROP-IN

£3/UNDER 5S GO FREE | PAY ON THE DOOR

Experimentarium is back and bigger than ever! Running for five days this year, it is jam packed with hands-on science of all kinds. Explore the music of molecules, how radiation works, some of Scotland's biggest pests and much more! Have a look at each activity to see what's in store! *Children must be accompanied by an adult.*

SHAKE YOUR BONDS UP!

AGES 5+
ACTIVITY



DROP-IN | ON UNTIL TUE 14 APRIL

Do you like dancing? Molecules do too! Join us to practice molecules' best moves and learn the basics of Infrared Spectroscopy! Make your own molecule out of clay, see how it interacts with light and then channel your inner water molecule and boogie on down to different rhythms.

Presented by the University of St Andrews

MATHEMATICAL!

AGES 5+
ACTIVITY



DROP-IN | ON UNTIL TUE 14 APRIL

Think Maths is boring? Think again! We've got lots of fun and interesting hands-on maths activities to tease and trick your brain.

Presented by Maths Week Scotland

OPERATION: PLANT HEALTH

AGES 5+
ACTIVITY



11AM-4PM AND 10AM-1PM (FRI) | DROP-IN

ON UNTIL FRI 17 APRIL

In the International Year of Plant Health come and see how Scottish Government scientists are helping farmers by protecting our crops and trees against insect pests and plant diseases. Come along to play our operation game, where you'll try to carefully remove different pests and diseases that are infecting the plant. Try your hand at identifying insects down the microscope, and find out all about DNA barcoding with the team from Science and Advice for Scottish Agriculture (SASA).

Presented by SASA

MOLECULAR MUSIC

AGES 5+
ACTIVITY



11AM-4PM AND 10AM-1PM (FRI) | DROP-IN

ON UNTIL FRI 17 APRIL

All things are made of atoms - little particles that move around in perpetual motion. And, similarly to musical notes that we can hear, feel, and interpret, atoms within molecules are moving, dancing, vibrating. Help us translate atomic vibrations and listen to the sound of your coffee, the soothing sound of aspirin or dripping drops of water.

Presented by the University of Bradford

KEEP YOUR CROPS WATERED

AGES 5+
ACTIVITY



11AM-4PM AND 10AM-1PM (FRI) | DROP-IN

WED 15- FRI 17 APRIL ONLY

Using this hands-on game, you'll discover what it's like to live upstream or downstream along a river, as you compete with other players to irrigate your farms. You need to get enough water to supply your own farm - but everyone is connected to the same river. Can you find a way to share the water fairly, or will the downstream farmers be left high and dry?

OUR RADIOACTIVE WORLD

AGES 5+
ACTIVITY



11AM-4PM AND 10AM-1PM (FRI) | DROP-IN

WED 15- FRI 17 APRIL ONLY

Learn about the principles of radiation protection by shooting Nerf® bullets down an alley, become a detective in our laboratory to hunt for radioactive contamination and see what surprising everyday objects contain radioactivity. Come along and you may get to meet Spiderman, who gained his superpowers after being bitten by a radioactive spider and take part in an online quiz to win your own Nerf® gun!

Presented by Society of Radiological Protection

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
| P.46 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
| P.47 | PALE BLUE DOT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.47 | TYRANNOSAURS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | ELEMENTARY BLUEPRINT 11AM-6PM STILLS CENTRE FOR PHOTOGRAPHY |

RECURRING EVENTS

| | |
|---------|--|
| P.42-45 |  9.30AM-4.30PM CITY ART CENTRE 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. |
| P.57 | GADGET FACTORY 10AM, 11.30AM, 1.30PM AND 3PM PLEASANCE |
| P.46 | EASTER TRAIL 10AM-4PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.50 | POUNDS AND PENCE: SCIENCE IN YOUR POCKET 10AM-4PM MUSEUM ON THE MOUND |
| P.57 | HERITAGE ROCKS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.57 | EXPERIMENTARIUM 11AM-4PM PLEASANCE |
| P.48 | HOLYROOD HERBAL HISTORIES 11AM AND 1.30PM PALACE OF HOLYROODHOUSE |
| P.50 | ELEMENTS IN THE PARK 1PM HOLYROOD PARK INFORMATION CENTRE |

14

APRIL

DIVING INTO THE DEEP

ALL AGES
ACTIVITY**DYNAMIC EARTH | STRATOSPHERE**10AM-4PM | DROP-IN | **FREE** WITH ADMISSION

Join us to celebrate our incredible ocean with **Dr Tony Gutierrez** from Heriot-Watt University and special guests from the Marine Conservation Society. Discover how microbes in our oceans are responsible for half of the oxygen in our atmosphere, explore how these tiny creatures can be used to help clean up pollution caused by humans and find out how human actions are affecting the ocean through fun activities led by experts.

Presented by Dynamic Earth

QUANTUM SPIES

ALL AGES
ACTIVITY**NATIONAL MUSEUM OF SCOTLAND**

LEARNING CENTRE LEVEL 2

10AM-4.30PM | DROP-IN | ON UNTIL SAT 18 APRIL

FREE

Shatter your illusion of light and dark through the mysteries of quantum informatics and save us from the 'dark' spies... Using special filters, you will discover hidden messages, cover your own tracks, and intercept secret communications. Your newly developed skills will let you tackle our top-secret mission and earn your unique spy licence.

Presented by The University of Edinburgh

MATHS: ELEMENTS OF MODERN SCIENCE

ALL AGES
ACTIVITY**NATIONAL MUSEUM OF SCOTLAND**

LEARNING CENTRE LEVEL 2

10AM-4.30PM | DROP-IN | ON UNTIL SAT 18 APRIL

FREE

How can misunderstanding a shape lead to catastrophic disasters like the destruction of the NASA Challenger shuttle? Can the roundness of a shape actually be measured? Explore these interlinked questions (and more) through interactive challenges and puzzles. Discover what mathematicians really do and how their work underpins the importance of shape for aerospace engineering and the world's latest discoveries.

Presented by The University of Edinburgh

POP-UP ENGINEERING

ALL AGES
ACTIVITY**NATIONAL MUSEUM OF SCOTLAND**

LEARNING CENTRE LEVEL 2

10AM-4.30PM | DROP-IN | ON UNTIL SAT 18 APRIL

FREE

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 to pop-up!

Presented by The University of Edinburgh

CALORIE COUNTDOWN BIKE

ALL AGES
ACTIVITY**NATIONAL MUSEUM OF SCOTLAND**

HAWTHORNDEN COURT

10AM-5PM | DROP-IN | ON UNTIL SAT 18 APRIL | **FREE**

Join Food Standards Scotland to discover how long it takes to burn off a jelly baby while cycling. You will be able to explore the link between food intake and energy in our fun bike activity.

Supported by

Food Standards Scotland
For safe food and healthy eating

MATHS MADNESS

AGES 8+
SHOW**PLEASANCE | UPPER HALL**11AM | 1 HOUR | **£6 OR £5 EACH FOR 3 OR MORE TICKETS**

Expect plenty of humour and some mind-bending mathematical concepts delivered by award-winning maths communicator and musical comedian **Kyle Evans**. Whether you're a mathspile or a mathspobe, Kyle brings joyous number-play, family entertainment and plenty of laughs.

CYBER ZONE

ELECTRONIC MUSIC: INTERMEDIATE

AGES 11+
WORKSHOP



PLEASANCE | PENTLAND ROOM

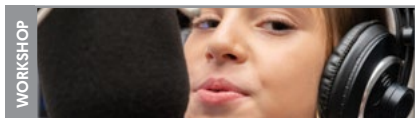
11AM | 90 MINS | £15

Find out how electronic circuits make sounds and build one of your own. Using a soldering iron you'll construct a Scuttlebut, a little synthesiser with a retro 70s look that is capable of making a variety of bleeps and beeps. *Previous soldering experience is required – a separate introductory workshop is available for soldering newbies on p.57. For more Cyber Zone events perfect for young adults and grown ups see p.21.*

Presented by MadLab Ltd

LIGHTS, CAMERAS, SCIENCE!

AGES 8+
WORKSHOP



NATIONAL MUSEUM OF SCOTLAND

LEARNING CENTRE LEVEL 4, STUDIO 1

11AM AND 2PM | 2 HOURS

FREE BOOKING REQUIRED

Come and join the BBC Scotland's L.A.B. team for a science based filming workshop. Learn how to interview a scientist and then film an experiment. Be prepared to join in and work as part of a team. This is a unique hands-on filming experience. *Ideal for ages 8-14. Check out the L.A.B. website bbc.co.uk/labscotland. Consent forms sent upon receipt of booking must be signed by a parent or guardian and brought to the event.*

Presented by BBC Scotland

ONE HEALTH

ALL AGES
ACTIVITY



ROYAL BOTANIC GARDEN EDINBURGH

JOHN HOPE GATEWAY

12PM-4PM | DROP-IN | **FREE**

Many infectious diseases may be transmitted between people and animals and require a One Health approach involving veterinary, public and environmental health working together to tackle the problem. Become a Disease Detective and try out some of the different tests that are used in labs to help find out what bugs are making us and our animals feel unwell.

Presented by Royal Botanic Garden Edinburgh

AETHER IN THE ARCHWAYS: FOR KIDS!

AGES 4+
WORKSHOP



ST GILES CATHEDRAL

1PM AND 2PM | 1 HOUR | ON UNTIL FRI 17 APRIL

FREE BOOKING REQUIRED

Come along with us to explore how instruments and voices sound differently depending on where you stand in this big, old, unique stone building. Using one instrument and many spaces, you'll follow a trail through the Cathedral with wee kazoos, making impromptu mini-concerts as you go. As an encore, you'll have the chance to create your own musical instrument to take home using recycled and reclaimed materials!

Presented by St Giles Cathedral

VOLCANOES THAT ROCKED EDINBURGH

AGES 7+
ACTIVITY



DYNAMIC EARTH | MEET AT DYNAMIC EARTH

2PM | 2 HOURS | ALSO ON THU 16 AND SAT 18 APRIL

£8/£6.50/£5

Lava will flow and sparks will fly as you join Edinburgh's resident volcano expert, **Angus Miller** of Geowalks, on an outdoor adventure in Holyrood Park. Explore the volcanic eruptions that rocked Edinburgh and helped form the city's landscape we see today, guided through the undulating geological past of Holyrood Park. A short indoor workshop will be followed by a family-friendly guided excursion. *Please dress appropriately for this outdoor event including sensible footwear and waterproof clothing. Children must be accompanied by an adult, all participants require a ticket.*

Presented by Dynamic Earth



We're branching out and crossing city limits to bring the Science Festival to new and exciting venues and to some of Scotland's most beautiful coastal areas. This year you can find us in theatres, the palace, galleries, gardens and even on the beach. In Edinburgh, Portobello, Dunbar and North Berwick.

Whatever you fancy, wherever you fancy it – there's something at the Science Festival for you.

| | |
|------|---|
| P.46 | INTO THE BLUE 24 HOURS 18 MARCH-27 APRIL PORTOBELLO PROMENADE |
| P.53 | SEASHORE NATURE DETECTIVES 2PM 9 APRIL FISHEROW HARBOUR |
| P.51 | SEASHORE SAFARI 10AM 8 APRIL PORTOBELLO |
| P.53 | ROCKPOOL RAMBLES 11AM 10-12 APRIL SCOTTISH SEABIRD CENTRE |
| P.63 | EUROPEAN STONESTACKING CHAMPIONSHIPS TIMES VARY 17-19 APRIL DUNBAR |
| P.48 | STREET SCIENCE TIMES AND DATES VARY AROUND EDINBURGH |

Search our website for more event suggestions.



ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
| P.46 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
| P.47 | PALE BLUE DOT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.47 | TYRANNOSAURS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | ELEMENTARY BLUEPRINT 11AM-6PM STILLS CENTRE FOR PHOTOGRAPHY |

RECURRING EVENTS

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|---------|--|
| P.42-45 | 9.30AM-4.30PM CITY ART CENTRE 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. |
| P.46 | EASTER TRAIL 10AM-4PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.50 | POUNDS AND PENCE: SCIENCE IN YOUR POCKET 10AM-4PM MUSEUM ON THE MOUND |
| P.58 | QUANTUM SPIES 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.58 | MATHS: ELEMENTS OF MODERN SCIENCE 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.58 | POP-UP ENGINEERING 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.57 | HERITAGE ROCKS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.58 | CALORIE COUNTDOWN BIKE 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.57 | EXPERIMENTARIUM 11AM-4PM PLEASANCE |
| P.48 | HOLYROOD HERBAL HISTORIES 11AM AND 1.30PM PALACE OF HOLYROODHOUSE |
| P.51 | LET'S LOOK AT THE HEART 11AM AND 1PM SURGEONS' HALL MUSEUMS |
| P.59 | AETHER IN THE ARCHWAYS: FOR KIDS 1PM AND 2PM ST GILES CATHEDRAL |

15

APRIL

AVA THE ALBATROSS

AGES 3+
WORKSHOP

PLEASANCE | PENTLAND ROOM
10AM, 11.30AM, 1.30PM AND 3PM | 1 HOUR
£6 OR £5 EACH FOR 3 OR MORE TICKETS

Join Wild Planet Explorers for a fun, educational and interactive session about the amazing lives of albatrosses! Using interactive props, imaginative play and music to share biology and conservation facts, you'll learn all about these magnificent birds and how you can help them from right here in Scotland. *Each ticket also admits one adult.*

Presented by Wild Planet Explorers

OUR LIVING PLANET

ALL AGES
ACTIVITY

DYNAMIC EARTH | STRATOSPHERE
10AM-4PM | DROP-IN | **FREE WITH ADMISSION**

As we approach the 50th anniversary of the very first Earth Day celebration, come along and find out how we can all do our bit to look after our home planet. Through games, activities and crafts, we explore the importance of pollinators to keep our planet healthy and our tummies full. Get your hands dirty and make a biodegradable wildflower pot to encourage these little heroes into your garden this spring.

Presented by Dynamic Earth

THE WHIRLYBIRD

AGES 3+
SHOW

PLEASANCE | PLEASANCE THEATRE
11AM AND 2PM | 35 MINS FOLLOWED BY 10 MINS STAY AND PLAY
£6 OR £5 EACH FOR 3 OR MORE TICKETS | **RP** RELAXED PERFORMANCE

In a cosy nest, two birds look skyward and get ready for their maiden flight. While flying comes easy for Bird, Whirlybird just can't get the hang of it. After many failed attempts, inspiration is found in a very special flying seed. A curious creature, ricketie-racketie on ground but in flight, a wildlife spectacle. Eco Drama present this uplifting show perfect for ages 3-7, featuring movement, music, bird song, puppetry and lots of things that spin. *Please note the 11am session will be a relaxed performance.*

Presented by Eco Drama

SHRED AND MELT

AGES 10+
WORKSHOP

ROYAL BOTANIC GARDEN EDINBURGH
PATRICK GEDDES ROOM
10.30AM, 11.30AM, 2PM AND 3PM | 1 HOUR

FREE BOOKING REQUIRED

Join artist **Carla Edwards** for a hands-on recycle and reuse workshop. Go through the process of turning waste plastic into precious plastic and make something useful by sorting, shredding, heating and press moulding single-use items to reuse in another form. A creative reminder that materials are precious and deserve reuse! *This event is linked to the exhibition Think Plastic: Materials and Making.*

Presented by Royal Botanic Garden Edinburgh

DIET DETECTIVES

ALL AGES
ACTIVITY



ROYAL BOTANIC GARDEN EDINBURGH

JOHN HOPE GATEWAY

12PM-4PM | DROP-IN | FREE

What we eat affects the planet's health as well as our own, so it's about time we solved that diet mystery. Become a Diet Detective and design your own healthy and sustainable diet. The scientific team at the Rowett Institute and BioSS will be on hand to help you use the *Number Muncher* to check the impact your diet has on the environment.

Presented by Royal Botanic Garden Edinburgh

IMAGINARY ENERGY

AGES 10+
SHOW



ROYAL BOTANIC GARDEN EDINBURGH

LECTURE THEATRE

6PM | 1 HOUR | £5

It's time to fire up your imagination – your energy imagination! We've totally lost the plot when it comes to our relationship with energy. We've become immune to its magical powers of sublime transformation and ignorant of its true value. We waste it and then complain it's expensive or we haven't got enough. It is time to reconnect and re-imagine our energy future. In this entertaining, interactive show, **Dr Stephen Peake** takes us on a tour of our weird energy past and our even stranger energy future.

Presented by Royal Botanic Garden Edinburgh

MEET THE KEEPERS

ALL AGES
SPECIAL EVENT



EDINBURGH ZOO

6.15PM, 6.30PM, 6.45PM AND 7PM | 90 MINS | £20/£10

Come and meet the zookeepers behind the *Big 5* campaign at Edinburgh Zoo. Enjoy a private tour of our rhino, sun bear, penguin and Wee Beasts enclosures, as well as a sneak peek of the new hilltop giraffe house. Each *Big 5* initiative addresses a critical environmental issue for wildlife and harnesses our unique expertise in saving species from extinction.

Presented by Edinburgh Zoo

Save the Date!

Edinburgh International
Children's Festival
 20-31 May 2020



What to expect at the Festival:

- ★ 15 visually stunning theatre and dance shows
- ★ Lots of laughs, gasps and maybe the odd cry
- ★ An experience that will stimulate curious minds
- ★ Free Family Day at the National Museum

Programme announced and tickets on sale from 24 March 2020

www.imagine.org.uk



ALBA | CHRUTHACHAIL

Colin Hattersley



We're used to plenty of dreich weather in Edinburgh but don't let the rain ruin your day.

Experience a family day out inside City Art Centre, pop in to one of our Pleasance shows, visit our exhibition in the National Museum or explore one of our partner venues across Edinburgh who are hosting exciting science workshops and events. There's plenty to do during the Science Festival that'll keep you dry, warm and indoors!

| | |
|---------|---|
| P.42-45 | 10AM-4PM 4-19 APRIL CITY ART CENTRE 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. |
| P.47 | PALE BLUE DOT 10AM-5PM 4-19 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.49 | IT'S ALL CONNECTED 10AM-5PM 6-10 APRIL NATIONAL MUSEUM OF SCOTLAND |
| P.57 | EXPERIMENTARIUM 11AM-4PM 13-17 APRIL PLEASANCE |
| P.21 | CYBER ZONE 10AM-4PM 13-18 APRIL PLEASANCE |
| P.65 | STRONGWOMEN SCIENCE 2PM 19 APRIL PLEASANCE |

Search our website for more event suggestions.

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
| P.46 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
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| P.50 | POUNDS AND PENCE: SCIENCE IN YOUR POCKET 10AM-4PM MUSEUM ON THE MOUND |
| P.58 | QUANTUM SPIES 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.58 | MATHS: ELEMENTS OF MODERN SCIENCE 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.58 | POP-UP ENGINEERING 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.58 | CALORIE COUNTDOWN BIKE 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.57 | EXPERIMENTARIUM 11AM-4PM PLEASANCE |
| P.48 | HOLYROOD HERBAL HISTORIES 11AM AND 1.30PM PALACE OF HOLYROODHOUSE |
| P.59 | AETHER IN THE ARCHWAYS: FOR KIDS 1PM AND 2PM ST GILES CATHEDRAL |
| P.59 | VOLCANOES THAT ROCKED EDINBURGH 2PM DYNAMIC EARTH |

THE SCIENCE FESTIVAL
16
APRIL

AIR POLLUTION: SEEING THE INVISIBLE



ALL AGES
ACTIVITY

DYNAMIC EARTH | STRATOSPHERE

10AM-4PM | DROP-IN | ALSO ON FRI 17 APRIL

FREE WITH ADMISSION

Have you ever wondered how scientists study harmful air pollution when they can't always see it? Although the pollutants can be invisible, we often see their impact on our own health and the environment around us. Meet scientists from the Centre for Ecology and Hydrology who work around the globe studying air pollution and discover some of the tools they use to understand the sources and effects of this problem. Join the team to become an air pollution scientist yourself to see the invisible!
Presented by Dynamic Earth

CAR OF THE FUTURE



AGES 9+
WORKSHOP

PLEASANCE | PENTLAND ROOM

11AM AND 2PM | 2 HOURS | £15

Could hydrogen power the cars of the future? Witness the technology of tomorrow today and use real hydrogen fuel to get your creations moving. 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 as you learn what works. Finally, put your car to the test to discover which design is the most efficient.
Presented by Arcola Energy Ltd

DINOSAUR DETECTIVES



AGES 5+
SHOW

PLEASANCE | PLEASANCE THEATRE

2PM | 1 HOUR | £6 OR £5 EACH FOR 3 OR MORE TICKETS

Dig up clues with the Dinosaur Detectives! Learn all about the fascinating fossil finds of Mary Anning, William Buckland and Gideon Mantell and how they changed the face of history by discovering the first dinosaurs in this perfect, prehistoric show.
Presented by Clydebuilt Puppet Theatre

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
| P.46 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
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| P.46 | EASTER TRAIL 10AM-4PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.62 | AIR POLLUTION: SEEING THE INVISIBLE 10AM-4PM DYNAMIC EARTH |
| P.50 | POUNDS AND PENCE: SCIENCE IN YOUR POCKET 10AM-4PM MUSEUM ON THE MOUND |
| P.58 | QUANTUM SPIES 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.58 | MATHS: ELEMENTS OF MODERN SCIENCE 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.58 | POP-UP ENGINEERING 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.58 | CALORIE COUNTDOWN BIKE 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.57 | EXPERIMENTARIUM 10AM-1PM PLEASANCE |
| P.48 | HOLYROOD HERBAL HISTORIES 11AM AND 1.30PM PALACE OF HOLYROODHOUSE |
| P.59 | AETHER IN THE ARCHWAYS: FOR KIDS 1PM AND 2PM ST GILES CATHEDRAL |

ONE LITTLE WINDMILL:
RHYMES AND STORIES



UNDER 3
WORKSHOP

PLEASANCE | PENTLAND ROOM
11AM | 45 MINS | **£6 OR £5 EACH FOR 3 OR MORE TICKETS**
A story session about wind and windmills with props, games and lots of joining in! Listen to the whistling winds that blow the windmills! *Each ticket admits one adult.*
Presented by storyteller Ailie Finlay

ONE LITTLE WINDMILL:
SENSORY STORIES



ALL AGES
WORKSHOP

PLEASANCE | PENTLAND ROOM
2PM | 45 MINS | **RP** RELAXED PERFORMANCE
£6 OR £5 EACH FOR 3 OR MORE TICKETS
A relaxed sensory story session about wind and windmills for children with additional support needs. With lots of tactile props and interesting objects to handle, you'll have fun while learning all about green energy. *Each ticket admits one adult.*
Presented by storyteller Ailie Finlay

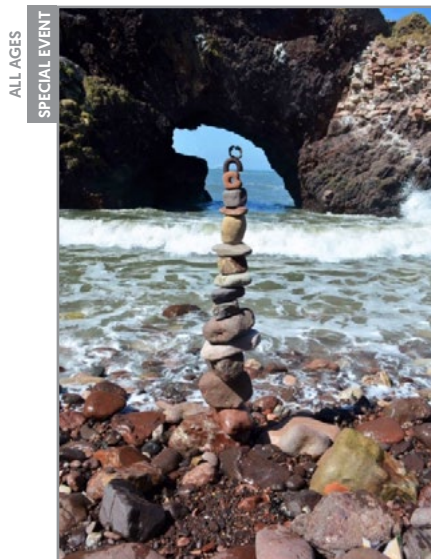
TWO IN A BARREL



AGES 5+
SHOW

PLEASANCE | PLEASANCE THEATRE
11AM AND 2PM | 40 MINS | **RP** RELAXED PERFORMANCE
£6 OR £5 EACH FOR 3 OR MORE TICKETS
Join quirky best friends Riri and Moku as they find themselves stuck in a barrel sitting on top of an island of rubbish in the ocean. Laugh yourself silly while they discover treasures in the vast waste that surrounds them and make up their own world of adventure and imagination. But when danger arises and rubbish threatens to cover them altogether, what can Riri and Moku do? *Two in a Barrel* explores the consequences of our habits and the challenges of co-existing in an environment with limited resources. *Please note the 11am session will be a relaxed performance.*

EUROPEAN STONE
STACKING CHAMPIONSHIPS



ALL AGES
SPECIAL EVENT

DUNBAR | DUNBAR 'EYE CAVE' BEACH
TIMES VARY | DROP-IN | ON UNTIL SUN 19 APRIL
£10 TO PARTICIPATE/FREE TO WATCH
Rounding off the Science Festival's contribution to Scotland's Year of Coasts and Waters, the *European Stone Stacking Championships* returns for the fourth year. Stone stacking takes materials found in nature and works with Earth's gravity to create sculptural towers, archways and other awe-inspiring structures from rocks and stones. Transient in nature – at the mercy of the elements, tides and time – these wonderful land-art creations merge artistic skill and the laws of physics to amazing effect. With competitions, demonstrations and workshops across the weekend, be amazed by what the professionals can create and try it for yourself! *See our website for more details. Please dress appropriately for this outdoor event including sensible footwear and waterproof clothing.*
Presented by the European Stone Stacking Championships in association with Edinburgh Science
Image: James Page

SCIENCE POP-UPS!



ALL AGES
ACTIVITY

EDINBURGH ZOO
11AM-4PM | DROP-IN | ALSO ON SAT 18 APRIL
FREE WITH ADMISSION | **RP** RELAXED PERFORMANCE
Meet the teams and learn more about what goes on behind the scenes at RZSS – both at Edinburgh Zoo and beyond! Talk trees with the garden team, visit the Pantanal via the virtual reality room and chat all things conservation with our WildGenes and field teams. Look out for the vet and primate stands to hear from the experts about what it takes to work in a zoo. *Please dress appropriately for this outdoor event including sensible footwear and waterproof clothing. Please note that there will be an autism-friendly session on Friday 17 April, 10am-11am.*
Presented by Edinburgh Zoo



ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
| P.46 | INTO THE BLUE 24 HOURS PORTOBELLO PROMENADE |
| P.47 | PALE BLUE DOT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.47 | TYRANNOSAURS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | ELEMENTARY BLUEPRINT 11AM-6PM STILLS CENTRE FOR PHOTOGRAPHY |

RECURRING EVENTS



| | |
|---------|--|
| P.42-45 | 9.30AM-4.30PM CITY ART CENTRE 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. |
|---------|--|

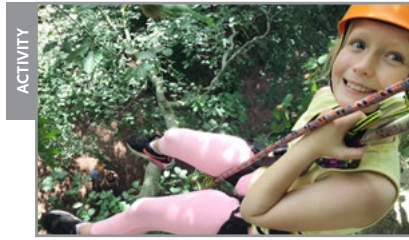
| | |
|------|--|
| P.46 | EASTER TRAIL 10AM-4PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.58 | QUANTUM SPIES 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.58 | MATHS: ELEMENTS OF MODERN SCIENCE 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.58 | POP-UP ENGINEERING 10AM-4.30PM NATIONAL MUSEUM OF SCOTLAND |
| P.58 | CALORIE COUNTDOWN BIKE 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.63 | SCIENCE POP-UPS 11AM-4PM EDINBURGH ZOO |
| P.48 | HOLYROOD HERBAL HISTORIES 11AM AND 1.30PM PALACE OF HOLYROODHOUSE |
| P.50 | ELEMENTS IN THE PARK 1PM HOLYROOD PARK INFORMATION CENTRE |
| P.50 | POUNDS AND PENCE: SCIENCE IN YOUR POCKET 1PM-4PM MUSEUM ON THE MOUND |
| P.59 | VOLCANOES THAT ROCKED EDINBURGH 2PM DYNAMIC EARTH |
| P.63 | EUROPEAN STONE STACKING CHAMPIONSHIPS TIMES VARY DUNBAR |

18

APRIL

TREE CLIMBING EXPERIENCE

AGES 6+



ROYAL BOTANIC GARDEN EDINBURGH

JOHN HOPE GATEWAY
10AM-12PM AND 1.45PM-3.45PM (HOURLY)
1 HOUR | ALSO ON SUN 19 APRIL | £25

Thrilling fun for everyone with an outdoor, up-high twist. Trees are masters of the elements and this climbing experience gives you the best opportunity to see the world from a new perspective whilst learning new skills, building confidence and having fun. Reaching new heights never looked so good! *Please dress appropriately for this outdoor event including sensible footwear and waterproof clothing.*

Presented by Royal Botanic Garden Edinburgh with Wild Trees Adventures

POLAR ICE WORLDS: HEATING UP AND MELTING DOWN

ALL AGES



DYNAMIC EARTH | STRATOSPHERE

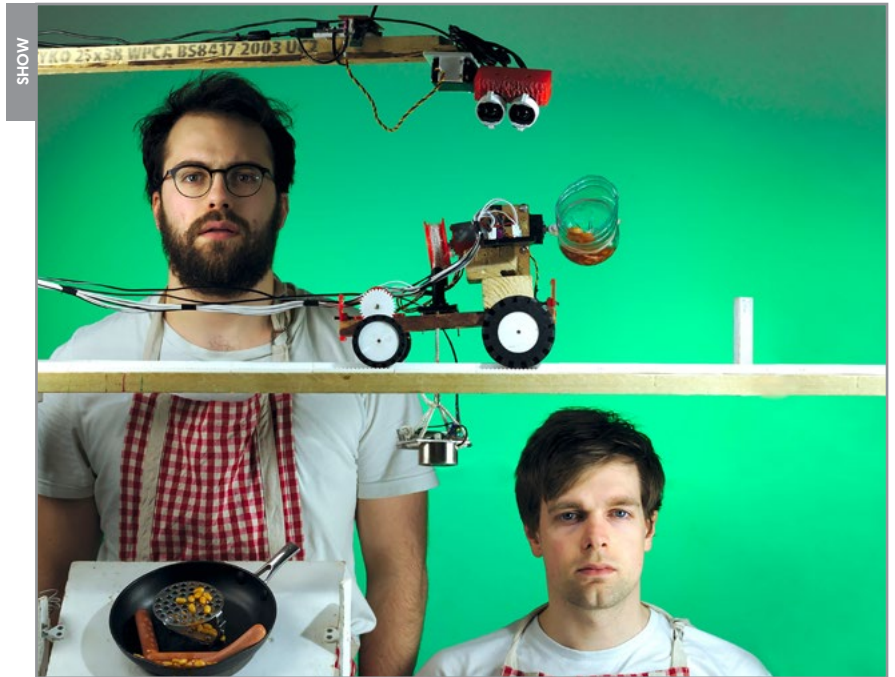
10AM-4PM | DROP-IN | ALSO ON SUN 19 APRIL
FREE WITH ADMISSION

The Polar Regions are some of the most spectacular yet vulnerable places on Earth. Discover how climate change is affecting these regions and what we can do to slow down this rapid warming. Expect hands-on science demonstrations, interactive activities, lively discussions of these critical issues and stories of incredible polar experiences from real scientists.

Presented by Dynamic Earth, The University of Edinburgh and the UK Polar Network

ROBOT CHEF

AGES 10+



PLEASANCE | PLEASANCE THEATRE

11AM | 50 MINS | £6 OR £5 EACH FOR 3 FOR MORE TICKETS

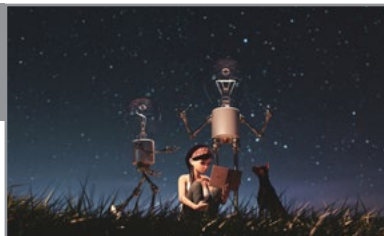
Bring your fully charged phone to control Foxdog's DIY robot chef! IT consultants **Lloyd Henning** and **Peter Sutton** present their award-winning interactive comedy show, where you'll operate a robotic kitchen using augmented reality avatars. Work together as a team to help cook dinner by igniting their gas stove, driving a sky tractor and firing the sausage cannon.

Presented by Foxdog Studios



FANTASTIC EXPERIMENTS

AGES 8+
WORKSHOP



NATIONAL MUSEUM OF SCOTLAND

LEARNING CENTRE LEVEL 4, STUDIO 1

11AM AND 2PM | 90 MINS

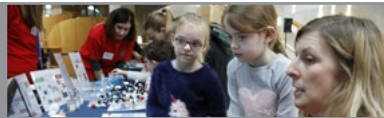
£6 OR £5 EACH FOR 3 OR MORE TICKETS

Explore the connections between imaginative children's books and the serious science that informs them. Breaking down the barriers between science and fiction, you'll be encouraged to explore experiments, designs and inventions in a range of stories before being creative and imagining your own.

Presented by Edinburgh Napier University

ADVENTURES IN SCIENCE

AGES 5+
SPECIAL EVENT



THE SCOTTISH PARLIAMENT

11AM-5PM | DROP-IN | ALSO ON SAT 4 APRIL | FREE

Join us at the iconic Scottish Parliament building for two family events that will offer an unrivalled adventure in science. Journey through earth, air, fire and water to discover the marvels of modern science through amazing hands-on activities, inspiring talks and creative learning for all. Held in the building responsible for legislating on many of the most pressing scientific and environmental issues we face, activities cover everything from the dazzling *Science is Magic* show; ideas on a sustainable future for planet Earth and the ever-popular Owl Magic display team. For ages 5+. Visit parliament.scot/science for more information.

Presented by The Scottish Parliament

SPACE APE BY ANDY CANNON

AGES 6+
SHOW



SCOTTISH STORYTELLING CENTRE

NETHERBOW THEATRE

3PM | 1 HOUR | £10/£8/£32 FAMILY

Once upon a time, approximately twenty years from now, Yorick stands alone, suited up and ready to blast off in a rocket on his celebrated journey to Mars. *Space Ape* will take you 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.

Presented by Red Bridge Arts in association with the Scottish Storytelling Centre

Image: Mihaela Bodlovic

ALSO ON TODAY



ONGOING EXHIBITIONS

| | |
|------|--|
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| P.47 | PALE BLUE DOT 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.47 | TYRANNOSAURS 10AM-5PM NATIONAL MUSEUM OF SCOTLAND |
| P.48 | ELEMENTARY BLUEPRINT 11AM-6PM STILLS CENTRE FOR PHOTOGRAPHY |

RECURRING EVENTS

| | |
|------|--|
| P.64 | TREE CLIMBING EXPERIENCE 10AM-3.45PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.46 | EASTER TRAIL 10AM-4PM ROYAL BOTANIC GARDEN EDINBURGH |
| P.64 | POLAR ICE WORLDS 10AM-4PM DYNAMIC EARTH |
| P.48 | HOLYROOD HERBAL HISTORIES 11AM AND 1.30PM PALACE OF HOLYROODHOUSE |
| P.63 | EUROPEAN STONE STACKING CHAMPIONSHIPS TIMES VARY DUNBAR |

CARBON CITY ZERO CARD GAME

AGES 8+
ACTIVITY



PLEASANCE | CABARET BAR

1PM-3PM | DROP-IN | £2 PER PERSON

As a newly appointed city mayor you have been tasked with creating a carbon neutral city. It sounds easy, but you'll soon discover that your carbon budgets are hard to balance. Can you hit the zero carbon target before your rivals? The race to become the first zero carbon city is on... *Come as a team of two to four people or join another group when you arrive, allow at least 45 minutes to play the game and under 16s must be accompanied by an adult.*

STRONGWOMEN SCIENCE

AGES 5+
SHOW



PLEASANCE | PLEASANCE THEATRE

2PM | 45 MINS | £6 OR £5 EACH FOR 3 OR MORE TICKETS

Ever wanted to know how to balance a chair on your chin, juggle liquid or eat fire? Following their show-stopping Edinburgh Science Festival debut last year, StrongWomen Aoife and Maria are back to reveal the scientific secrets behind their astounding tricks in this fun, lively and fast-paced family circus performance. Learn how science helps jugglers, acrobats and hula hoop artists create their acts and have a go yourself in the after show activities. Because when science meets circus, anything's possible. *An after show workshop will take place in the Lomond Room, 3pm-4pm, and will be first come first served.*

Presented by Circus250

SCIENCE FESTIVAL
19
APRIL

BEYOND THE FESTIVAL

EDINBURGH SCIENCE FOUNDATION – OUR CHARITABLE WORK

SCIENCE AT THE HEART OF EVERYTHING

Our mission is to inspire, encourage and challenge people of all ages and backgrounds to explore, understand and engage with the world around them.

SCIENCE AT THE HEART OF COMMUNITIES

COMMUNITY FUNDING PARTNERS



cruden

Edina
Trust



AWARDS
FOR ALL
SCOTLAND



Wheatley
Foundation

The PLACE (Platforms for Creative Excellence) Programme is funded by the Scottish Government – through Creative Scotland – the City of Edinburgh Council and the Edinburgh Festivals



Scottish Government
Riaghaltas na h-Alba
gov.scot

• EDINBURGH •
THE CITY OF EDINBURGH COUNCIL



ALBA | CHRUTHACHAIL



We create strong partnerships with community groups in and around Edinburgh to deliver bespoke activities in underserved areas and make the annual Science Festival more accessible. We also train youth workers which helps to make this model sustainable.

During the Science Festival, we transform City Art Centre into a five-floor science playground. We are able to open this up for two additional days pre-Festival, allowing local schools access free of charge. Thanks to support from our Headline Edinburgh Science Learning Sponsor, Baillie Gifford, The Russell Trust and Edina Trust.

We deliver our *Generation Science* programme across Scotland aiming to reach every local authority and up to 60,000 pupils annually between February and June.

Every year, Edinburgh Science provides a reimagined, interactive careers event for 11–15 year olds in the National Museum of Scotland. *Careers Hive* is free for schools to attend and encourages young people to consider how they might be the ones to impact world problems if they continue with science and technology subjects.



THANK YOU

We are Scotland's largest science outreach charity but we cannot continue our work without your support.

Thank you to all of our generous supporters who are acknowledged on our supporter pages at the front and back of this publication.

A special thank you to our *Catalysts*, a network of individuals and organisations who support our charitable effort and encourage the next generation to engage with science, technology, engineering and mathematics.

By making a financial gift, this group of *Catalysts* ensures that our activities can be enjoyed by all – whatever their background.

Please consider becoming a *Catalyst* too. You can get more information from Hannah Schlesinger, our Director of Development: hannahs@scifest.co.uk.

THANK YOU TO OUR 2019/2020 CATALYSTS FOR THEIR GENEROUS SUPPORT

BENEFACTORS

Dr David Milne
The Nimar Charitable Trust

PATRONS

The Binks Trust
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Dr Simon Gage OBE
Dr Richard Kimberlin OBE
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Edina Trust
Iain Ritchie CBE

INNOVATORS

Dr Janet Brown
Joe Faraday
Ron Inglis
Mairi Mickel
Prof Ian Wall

ADVOCATES

Hannah Schlesinger Brodie
Dr Sebastien and Mrs Hazel Lambert

and all those who wish to remain anonymous

Registered Charity no. SC003790

WITH SPECIAL THANKS TO OUR LEARNING SUPPORTERS

HEADLINE SPONSOR FOR EDINBURGH SCIENCE LEARNING



Investment managers

Edinburgh Science is delighted to announce that Baillie Gifford will be supporting the Edinburgh Science Learning programme as Headline Sponsor for 2020. This will include supporting the School Days at the Edinburgh Science Festival; the Community Engagement programme; *Careers Hive* public day and travel bursaries for schools; *Beyond the Hive*; and *Generation Science* delivery. We are very grateful for this funding from our long-term supporter, Baillie Gifford.

PRINCIPAL FUNDING PARTNERS



MAJOR FUNDING PARTNERS



FUNDING PARTNERS



WITH THANKS

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EASTER HOLIDAY ENTERTAINMENT AT EDINBURGH SCIENCE FESTIVAL



Many Science Festival venues are in the city centre and are easily accessible on foot or by public transport. Please be aware of the environment when planning your travel to and from our events and consider using public transport.

BY BUS

Visit lothianbuses.co.uk or call **0131 555 6363** for more information.

BY TRAIN

Websites such as ScotRail and National Rail Enquiries include train company promotions, train times and fare enquiries: scotrail.co.uk, nationalrail.co.uk.

BY BIKE

Plan your cycle routes through the city at edinburgh.cyclestreets.net. With the addition of edinburghcyclehire.com hire points across the city, you don't need to own your own bike to pedal to our venues!

TOURIST INFORMATION

You can find out more about Edinburgh and the surrounding area, and find and book accommodation online at visitscotland.com.

