Events all around Oxford
18–28 October 2019

www.if-oxford.com
Welcome to the science and ideas Festival

IF Oxford is 11 days of events for everyone to explore science, ideas and creativity. Come to shops, theatres and pubs across Oxford to experiment with hundreds of innovative ideas. Here are some of the Festival Director’s picks:

Please contact the Festival team if you would like all or part of this publication in an alternative format, or if you have any specific access requirements for our events.

IF Oxford uses Pay What You Decide (PWYD) ticketing so you can pre-book events without paying in advance. After the event, you decide to pay what you want, or can afford. Spaces may be available at the start of an event and tickets may be re-allocated if people are late.
Events index/map of all venues
► 62–63 / 64–65

Get hands-on in the interactive zones
► 8, 12, 20, 31, 50, 54, 56

Jump into games and immersive challenges
► 15, 17, 22, 46, 58, 59

Meet authors, innovators and comedians
► 19, 24, 28, 32, 34, 35, 36, 39, 43, 45

Enjoy performance, film and art
► 5, 7, 16, 18, 23, 30, 32, 33, 41, 43, 60

For information about the Festival and general conditions for attendance, visit: www.if-oxford.com
Rhymetime: songs and rhymes for under-5s

Various dates
11 – 11.30am

Oxfordshire County Library,
Queen Street, Westgate, OX1 1DJ
Pre-book, Free
Family
Storytelling

Fri 18 October
Space: Travel into space with a cosmic theme

Mon 21 October
Animals: Explore the animal kingdom

Wed 23 October
Robots: Discover machines and technology

Fri 25 October
Nature: Immerse yourself in the natural world

Mon 28 October
Weather: From rain to sunshine, hot to cold

First Imprints

Sat 19 October: 11am – 5pm
Mon 21 October: 4 – 8pm
Tue 22 October: 11am – 6pm
Wed 23 October: 6 – 8pm
Sat 26 October: 11am – 5pm
Mon 28 October: 4 – 8pm

Oxford Printmakers,
The Christadelphian Church Hall,
Tyndale Road, Oxford, OX4 1JL
Unticketed, PWYD
Adults, Family
Exhibition

View fine art prints demonstrating the versatility of printmaking and the story of first animal evolution from the Cambrian Explosion (540 – 500 million years ago) that produced the ancestors of all animals alive today.

Artists will be demonstrating their techniques and answering questions from 4 – 6pm on both Mondays and Tuesday, 6 – 8pm Wednesday and 2 – 5pm on both Saturdays.
Only Expansion

Saturday 19 – Sunday 27 October
Sat 19, Sat 26, Sun 27: **10.30am, 12pm, 1.30pm, 3pm, 4.30pm**
Mon – Fri: **11am, 1pm**

**Running time: 45 minutes**

**Starts at Oxford Playhouse**
11 – 12 Beaumont Street, OX1 2LW

**Pre-book, £5 via Oxford Playhouse**

**Adults, Teenagers**

**Audio Walk**

Experience a unique audio-walk through Oxford. Remix the sounds of Oxford and experience how your own life might change in the future with a beautifully made guidebook prompting you to explore the city. Choose your own route, while headphones with customised electronics capture and manipulate the sounds around you. Voices of passers-by become a choir, bus brakes create pulsating rhythms, these might then be blended with desert winds from Tunisia or the crumbling coasts of Norfolk.

Presented in collaboration with Oxford Playhouse.

Collect your guidebook and headset from Oxford Playhouse’s ticket office.

Present your ticket at the OP Café Bar for 20% off food and drink.

⚠️ Also on Mon 28 Oct
See page 59 for more information
I am interested in how people think about their lives, and how their physical environments shape their sense of self and their sense of their world. Growing up in Johannesburg, a place of gross, systemic inequality, I began to wonder how ideas can build communities and change how people see the world, and equally how a place, how infrastructure, can impact on a person’s own sense of what’s possible.

Now I live in Oxford, a place of great enquiry, I see alternative sides to the city’s history that are less often heard or shared. During our new literary edition of Uncomfortable Oxford, we discuss unexpected and lesser-known literary facts that might surprise visitors and locals, including how science fiction was influenced by scientific debates, with people like Thomas and Aldous Huxley, happening here in this city. We also look at Oxford’s influence on writers like Virginia Woolf, Lewis Carroll, Helen Fielding, Tayeb Salih, Diran Adebayo, and Dambudzo Marechera.

My research examines architecture, inclusion and exclusion, and city spaces in science fiction. I also explore, from a social science perspective, how the future might be enhanced or threatened by technologies like AI and machine learning. Our Futures Thinking events at the Festival are an example of how Science and the Humanities work hand-in-hand and I look forward to learning what you think about how we can bring these two fields into closer conversation.

MEET THE RESEARCHER

Chelsea Haith
DPhil Candidate in Contemporary Literature, Faculty of English Language and Literature, University of Oxford

Related events

Uncomfortable Oxford tour
► See page 7
Sat 19, Sun 20, Sat 26, Sun 27 October

Living Library
► See page 10
Fri 18 October

The noise that keeps me awake
► See page 51
Sat 26 October
I:DNA
inside the helix

Fri 25 October: 2.30pm – 6pm
Sat 26 October: 11am – 5pm
Sun 27 October: 11.30am – 5pm
Mon 28 October: 11am – 4pm

Cowley Road Methodist Church,
Cowley Road, OX4 1BN
Unticketed, PWYD
Adults, Teenagers
Art installation

An immersive experience combining sculpture, digital imagery and a sung and spoken soundscape. Step though an airport scanner to hear and see the stories from inside a DNA double helix. The arms of the helix are de-naturing, weighed down by baggage hung upon them. Map the journeys of those who have lived experience of an inherited genetic condition. Based on research by Dr Felicity Boardman, University of Warwick.

Uncomfortable Oxford tour:
literary edition

Sat 19, Sun 20, Sat 26 and Sun 27 October
11.30am – 1pm

Christ Church Meadow
(near College entrance)
St Aldate’s, OX1 4JF
Pre-book, PWYD
Adults, Teenagers
Walking tour

This walking tour explores imaginary maps of Oxford found in literature and discusses the tensions they bring to its modern realities. Walk in the footsteps of JRR Tolkien and CS Lewis, Salman Rushdie and Helen Fielding, and discover Oxford as a setting, an inspiration and a site of contention. This event is run by Uncomfortable Oxford, a student-led social enterprise that facilitates discourse on difficult legacies in our lived environment.
Life Times: experiencing change through mind, body and place

Friday 18 October
12 – 9.30pm
Weston Library,
Broad Street, OX1 3BG
Unticketed, Free
Hands-on, talks, Living Library
Café and shop open
Family, Teenagers, Adults

How do our minds and bodies alter as we age? Can attitudes change from one generation to the next? How have the built and natural environments around us changed in the last 200 years? What are our hopes and fears for the future and how different will it be? Join researchers at the Bodleian’s Weston Library to look into the past, present and future.

Exhibits at the Weston Library:

Daniel Meadows: Now and Then

Daniel Meadows’ photographs and audio recordings capture the life of England’s ‘great ordinary’. Each pair of photographs depicts the same people separated by an interval of twenty-five years. Sixteen short films open a window onto the lives of those portrayed.

This exhibition and the associated book commemorate the Bodleian Library’s acquisition of the Daniel Meadows archive and can be viewed from 4 October – 24 November 2019.
Mice, chicks, fish and me!

Explore how babies develop in the womb by manipulating embryos in virtual reality and observing them under microscopes. See how the hearts of live zebrafish embryos grow and change shape as they develop over the day.

Department of Physiology Anatomy and Genetics
University of Oxford

Memory in health and disease

Try simple tasks that assess memory and motivation in people with and without Alzheimer’s and Parkinson’s Diseases. Learn how NHS researchers develop assessment and care procedures for patients.

Department of Experimental Psychology
University of Oxford

Futureyou2020

Think about your future self. Imagine what you might be like in the future and explore how you might achieve your hopes.

School of Education
Oxford Brookes University
(12-5pm only)

Remains II: Twenty Future Fossils

Remains two is a sculpture comprised of twenty human milk teeth reproduced at a giant scale using photogrammetry and 3D printing techniques. How do we remember our previous selves?

School of Arts
Oxford Brookes University

Stereoscopic Oxford

Photo historians from Dr Brian May’s London Stereoscopic Company display a collection of vintage 3D cameras and View-Masters, and show you how to use a cheap, user-friendly smartphone app to take stunning 3D photos.

Denis Pellerin

Changing faces

Use simple widely-available technology to see what impact our modern day lifestyles could have upon our future looks. See what effects smoking, drinking, and pollution might have on your face in decades to come.

Bodleian Digital Communications

The noise that keeps me awake

Climate catastrophe, rogue robots, asteroids and pandemics. We are surrounded by nightmares that could put an end to human life as we know it. What fears actually keep you awake and how closely do they match the real threats to our existence?

The Futures Thinking Network (TORCH)

Who writes the future?

Local young people have written short stories about their hopes and fears for our computerised futures. Meet them and pick up a copy of their illustrated anthology.

Bodleian Summer School students
(7-9.30pm only)
Living Library

6.30 – 9.30pm

Choose a book from our shelf and borrow a real, live researcher for a ten-minute conversation. All of our ‘living books’ study aspects of change, whether it be changes to our bodies, minds, attitudes or the world around us. Take this opportunity to chat to friendly experts and maybe it will change the way you think.

Talks in the lecture theatre

5 – 5.45pm

Victorian Oxford through the stereoscope

Between 1857 and 1860 the Oxford firm Spiers and Son commissioned famous photographers to document Oxford in 3D with a cutting-edge optical instrument, the stereoscope. Using original negatives from the Bodleian Libraries’ archive and positive prints from Dr Brian May’s collection, photo historian Denis Pellerin takes you back in time through Oxford’s streets. Visit Oxford ‘in depth’ as it was then, meet one of the very first photobombers, and discover the city of ‘Spiers’ as you’ve never seen it before.

7 – 7.45pm

Remains II: Twenty Future Fossils

Visual Artist Dr Clair Chinnery interprets the ‘shapeshifting’ capabilities of human bodies as they emerge, grow, mature and die, informed by the physical materials left behind when such changes occur. With Digital Developer Gerard Helmich she has produced giant 3D printed sculptures of infant milk teeth and has also collaborated with the Parkinson’s Brain Bank at Imperial College London, working with microscopic images of diseased neurons. Discover how this ‘autoethnographic’ project reaches forwards and backwards in time, considering the irretrievable pasts and unknowable futures of ‘intergenerational’ experiences.

Accompanied by installation of Remains II at the Weston Library see page 9
8 – 9pm

**Now and Then**

Daniel Meadows is a pioneer of contemporary British documentary practice. His exhibition *Daniel Meadows: Now and Then* presents pairs of portraits taken in the 1970s and again in the 1990s, alongside short films explaining how the pictures came about and what happened next. In this talk, Daniel Meadows will shine a light onto the collection and reveal the ‘felt-life’ of his documentary practice. He will also explore the encounters he has had with strangers as he criss-crossed the country in a vintage double decker bus that was once his home, darkroom and gallery, and from where he made free portrait photographs for all-comers and listened to their stories.

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**Research in harmony**

Friday 18 October
7.30 – 8.30pm

*Hertford College Chapel,*
*Catte St, OX1 3BW*

*Pre-book, PWYD*

*Adults, Teenagers*

*Performance, Talk*

Ever wondered what it’s like to be a biomedical research scientist? Join us for stories of science told through popular songs re-written by researchers from the Wellcome Centre for Human Genetics and the Jenner Institute, accompanied by Oxford’s premier postgraduate mixed-voice vegetable-named a cappella group, The Beatroots.
Westgate Wonderlab

Sat 19 October
9 – 5pm

Wander into Westgate Oxford to meet researchers working at the cutting-edge of science right here in Oxford. Try hands-on activities in Leiden Square (opposite John Lewis and Partners) to investigate the latest research on mind, body and environment, or pop along to Westgate Social Street Food to see what’s hot in quantum computers, technology, physics and engineering.

Elsewhere in the shopping centre, look out for our science buskers with a giant periscope and peer at Oxford from a new perspective, or have dinner with a dinosaur (page 16).
Activities in Leiden Square:

Use your superpowers to fight cancer

Find out how new therapies boost your immune system to fight cancer with games for all ages. Become an immune cell and separate healthy cells form cancer cells against the clock. Maybe you’ll win your own Nobel Prize chocolate medal.

MRC Weatherall Institute of Molecular Medicine
University of Oxford

Cutting edge

Try your hand at surgery and perfect your surgical techniques with a range of activities. Explore what goes on inside your body and find out about how researchers discover new ways to effectively treat medical conditions.

Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences / Nuffield Department of Surgical Sciences
University of Oxford

The PsychScience booth

All is not what it seems! Enter the fascinating world of psychological research. Our visual illusions, writing challenges, Stroop test and brain quizzes may have you questioning your perception, and challenging mind myths.

Department of Psychology
Oxford Brookes University

Big data solving big puzzles in human health

How do scientists produce reliable information on the causes, treatment and prevention of diseases? Play games to find out how population health researchers collect and process data to improve our understanding of diseases and answer important questions about human health.

Nuffield Department of Population Health
University of Oxford

Make your own ’g’nome

You may have heard of a ’genome’, but have you ever heard of a ’g’nome!? Meet researchers who study the reasons why we should or shouldn’t manipulate our DNA. Have a go at making your own ’g’nome and learn about what makes us each unique.

Wellcome Centre for Ethics and Humanities
University of Oxford

3D shapes from crystals and X-rays

Proteins in our bodies control our movement and metabolism at a molecular level. Their 3D shapes determine how they do this correctly and occasionally go wrong. Discover how crystals and X-rays help visualise protein shape and function.

Department of Biochemistry
University of Oxford
Westgate Wonderlab

Harnessing the power of T-cells to develop new medicines

Experiment with a new type of therapy to treat cancer, infectious diseases and autoimmune diseases, using the body’s own immune system. Play games to find out how these therapies work and how they are developed.

*Immunocore*

Blue Sky research

Earth, air, and oceans... on a table. Identify mystery river water samples, catch your breath on air monitors, and test how radioactive you are! See acidification of a smoking ocean and become an environmental detective digging up microplastics invading our ecosystem. Includes high-powered magnifying glasses!

*Environmental Chemistry Group Royal Society of Chemistry*

Activities in Westgate

Social Street Food:

Inside fusion: making a sun on Earth

Look inside a fusion machine and see what it takes to work at the hottest place in the solar system! Try your hand at building your own fusion device, take a robotics challenge, and find out how plasma, the fourth state of matter, can help us create the energy of the future.

*United Kingdom Atomic Energy Authority*

Discover life in a Quantum City

Imagine a future city with driverless vehicles, cameras that can see the invisible, quantum computers that can develop new drugs, sensors that could predict earthquakes and secure communications that cannot be hacked. Discover more about the transformative effect of quantum technologies in everyday life!

*Department of Physics University of Oxford*

Superconducting magnets in MRI

In hospitals worldwide, MRI scanners help diagnose tumours, clots and tissue damage. Explore the heart of the MRI machine, a superconducting magnet, where one in three of these magnets across the globe are made here in Oxford.

*Siemens Healthineers Magnet Technology*

Designing the future – engineers reimagining the world

Discover research from the world's leading Engineering Science department. From robotics and wireless power toys or paper programming and origami structures to smartphone apps aiding recovery from stroke. Meet the engineers providing hands on demonstrations of their latest research.

*Department of Engineering Science University of Oxford*
Science Oxford RoboChallenge

Saturday 19 October
10 – 11.30am, 12.30 – 2pm, 2.30 – 4pm

Make Oxford, The Basement, Oxford Centre for Innovation, New Road, OX1 1BY
Pre-book, £9.07 inc booking fee
Family Workshop

Prepare for combat young coders – the robot battle is about to begin! Join the Creative Computing Club to program the motors of robots and learn how to move them, before stepping (or wheeling) into the arena, where they’ll take part in battles and challenges to put your code to the ultimate test!

Suitable for 9-12 year olds - must be accompanied by an adult.

Immersed in conservation

Saturday 19 October
11 – 11.45am, 1 – 1.45pm, 3 – 3.45pm

Oxford Deaf and Hard of Hearing Centre, 10 Littlegate St, St Ebbes, OX1 1RL
Pre-book, PWYD
Adults, Teenagers
Hands-on, escape room

Immerse yourself in an escape game that empathises with endangered species and finds ways to change their fate. Experience conservation science in a fun and collaborative way and learn how your daily actions can affect species on the other side of the world.

Suitable for age 13+. Please arrive 15 minutes before start time. Unclaimed tickets will be re-allocated 5 minutes before the sessions start.
Iguanodon restaurant

Saturday 19 October
12 – 1pm, 2 – 3pm

Leiden Square, Westgate
Oxford, Queen Street, OX1 1TR
Unticketed, PWYD
Family
Performance

Crystal Palace, New Year’s Eve 1853. A sumptuous banquet is underway inside a life-sized Iguanodon model. Historical characters emerge; early ‘undergroundologists’ – England’s fossil finders. Dinosaurs are hot news; captivating everyone, but what do they mean? As new, unsettling ideas of extinction and evolution emerge, puddings spin and birds fly from pies!

Throughout the day, discover fossils and dinosaurs with the Oxford University Museum of Natural History.

Lovelace’s labyrinth

Saturday 19 October
12 – 4pm

History of Science Museum, Broad Street, OX1 3AZ
Unticketed, Free
Family
Hands-on

Join Ada Lovelace and friends at the museum for a day of mathematical puzzles, activities and problem-solving from geometry to code-breaking.

Suitable for ages 6 and above – must be accompanied by an adult.
**Vector**

Saturday 19 October  
**12 – 1.30pm, 2.30 – 4pm**

The Old Fire Station,  
40 George Street, OX1 2AQ  
Pre-book, PWYD  
Adults, Teenagers  
Immersive performance

A new virus is ravaging the planet, infecting animals and humans at a worrying rate. Welcome to BioLabs, a medical research facility tasked with managing this crisis. Working against rival laboratory teams, our Artificial Intelligence System will guide you to decide the most effective and ethical solution, but time is short and lives are on the line... This interactive experience explores the ethics of using animals in medical research.

Please arrive 15 minutes before start time. Unclaimed tickets will be re-allocated 5 minutes before sessions start.

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**Honouring the herbalists**

Saturday 19 October  
**12 – 2pm**

Oxfordshire County Library,  
Westgate Oxford, Queen Street, OX1 1DJ  
Pre-book, Free  
Adults, Teenagers  
Workshop

Join Natty Mark Samuels from the African School for an interactive workshop, exploring the history of herbalism, with a focus on Africa and the Caribbean. Celebrate Black herbalism, past and present, and find out how herbal products have been made and used for centuries.
CELL – exploring the universe inside our bodies

Saturday 19 October
1 – 2pm and 3 – 4pm

St Michael’s Primary School, Marston Road, OX3 0EJ
Pre-book, PWYD
Family Performance

Join us amongst inflatable cells as they come alive with dance and make you marvel at the power, quirks and hidden world of cells and DNA. Aimed at primary school children and their families, but suitable for any curious mind, the performance will include a short Q&A with scientists from the University of Oxford. Take away your own cell-themed comic book.

Storytime – natural world

Saturday 19 October
3 – 4pm

Oxfordshire County Library, Westgate Oxford, Queen Street, OX1 1DJ
Unticketed, Free
Family Storytelling

Join storyteller Sarah Law to meet incredible animals from around the world and discover the amazing places they live. Celebrate the natural world through stories and rhymes and think about how we can all keep our planet healthy.

Best suited to children aged 5 – 9 years. Children must be accompanied by an adult.
When children became evil

Saturday 19 October
6 – 7pm

Wig and Pen
9 – 13 George Street, OX1 2AU
Pre-book, Free
Adults, Teenagers
Talk

After WWII, portrayals of ‘evil children’ proliferated in horror and science fiction films in both Britain and the US. But why were children suddenly being presented as dangerous threats rather than innocent victims? And why was society so hungry to consume portrayals of disturbed and abnormal young people after 1945?

This talk by Laura Tisdall was awarded the annual Jacob Bronowski Award Lecture for Science and the Arts by the British Science Association.

Brian Malow: Just add gravity!

Saturday 19 October
7.30 – 8.30pm

Wig and Pen
9 – 13 George Street, OX1 2AU
Pre-book, PWYD
Adults, Teenagers
Talk

Science comedian Brian Malow will make you laugh and think as he wheels his comic vision from the Big Bang to dinosaurs to leaves of grass. Weaving thoughts on unity and division, Pangea and dark energy, Brian brings the universe down to Earth. LOL at his cosmic musings but, by the end of the hour, you’ll have a new appreciation for gravity. You’ll understand why Brian says your voice is sunshine. And you’ll never look at birds in the same way again.
Explorazone

Sun 20 October
12 – 5pm

Oxford Town Hall,
St Aldate’s, OX1 1BX

Unticketed, PWYD

Adults, Teenagers, Family
Hands-on

See some of the most exciting science in town for free! Visit Oxford Town Hall to try out dozens of interactive exhibits suitable for all ages.

Discover life in a Quantum City

Imagine a future city with driverless vehicles, cameras that can see the invisible, quantum computers that can develop new drugs, sensors that could predict earthquakes and secure communications that cannot be hacked. Discover more about the transformative effect of quantum technologies in everyday life!

Department of Physics
University of Oxford

Epigenetics: how do identical twins differ?

Environmental factors alter how we develop and age. Find out how chemistry influences which of our genes are activated and inactivated. This allows caterpillars to transform to butterflies, explains why identical twins look increasingly different as they age, and impacts upon our health and well-being.

Department of Chemistry
University of Oxford
<table>
<thead>
<tr>
<th>Event</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Designing malaria vaccines</strong></td>
<td>Malaria is one of the deadliest human diseases, killing a child in Africa every few minutes. A vaccine is urgently needed, but the parasite is a master at evading detection. Join us to learn about the breakthrough that could help humanity fight back.</td>
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<tr>
<td><strong>Worm superheroes: regenerative animals that bring light to stem cells research</strong></td>
<td>The idea of regenerating lost body parts has captured human imagination for centuries. Understanding how animals replace missing structures has huge implications for human regenerative medicine. Meet the worm superheroes with regenerative powers and learn how stem cells are involved in the process.</td>
</tr>
<tr>
<td><strong>Cutting edge</strong></td>
<td>Try your hand at surgery and perfect your surgical techniques with a range of activities. Explore what goes on inside your body and find out about how researchers discover new ways to effectively treat medical conditions.</td>
</tr>
<tr>
<td><strong>How do babies feel pain?</strong></td>
<td>Discover how baby brains develop, and how they differ from fully grown adult brains. Learn how the Paediatric Neuroimaging Group uses these findings to investigate how infants feel pain, and how more effective analgesics are developed for very young people.</td>
</tr>
<tr>
<td><strong>Does it work? Proving some ideas bring real patient benefit</strong></td>
<td>How do we know that a treatment works? There are lots of great ideas out there, but how can we be confident that an idea delivers real benefit? Explore how to make the fairest possible tests of ideas for new cancer treatments.</td>
</tr>
<tr>
<td><strong>Augmented reality for STEAM education</strong></td>
<td>Imagine turning a room into a scale model of the Universe with just a pair of glasses! Augmented Reality is bringing the school environment into the 21st century, with a huge variety of learning opportunities for students. Try out a range of applications and discover how AR can unfold its magic.</td>
</tr>
</tbody>
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Blue Sky research

Earth, air, and oceans... on a table. Identify mystery river water samples, catch your breath on air monitors, and test how radioactive you are! See acidification of a smoking ocean and become an environmental detective digging up microplastics invading our ecosystem. Includes high-powered magnifying glasses!

*Environmental Chemistry Group
Royal Society of Chemistry*

Superconducting magnets in MRI

In hospitals worldwide, MRI scanners help diagnose tumours, clots and tissue damage. Explore the heart of the MRI machine, a superconducting magnet, where one in three of these magnets across the globe are made here in Oxford.

*Siemens Healthineers
Magnet Technology*

Inside fusion: making a sun on earth

Look inside a fusion machine and see what it takes to work at the hottest place in the solar system! Try your hand at building your own fusion device, take up our robotics challenge, and find out how plasma, the fourth state of matter, can help us create the energy of the future.

*United Kingdom Atomic
Energy Authority*

Diamond: an engineering gem

Diamond is an amazing material, however most people think only of diamond as a gemstone. Diamond actually has an impact on your everyday life in shaping the things around you, from being used to engineer your smart phone to use in lasers that cut sheet metal for cars.

*Element Six*

What do you know about nanomaterials?

Nanomaterials are microscopic particles that can occur naturally or be man-made. They have many useful applications in biomedical, optical and electronic research, but can they be harmful to our health or the environment? Discover the properties of nanomaterials and learn how they can affect biological and environmental systems.

*Public Health England*

Gaming zone

Can playing computer games help us learn new skills? How do sensory stimuli in game play affect how we feel? What does our choice of avatar reflect about us? Do we play differently against friends than strangers? Play a variety of computer games and maybe learn something about yourself.

*Games Development Students
City of Oxford College*

Pop-up book stall

Your one-stop-shop to buy Festival-related books for children and adults, plus science-themed games and kits.

*Waterstones*
**Gravestone geology**

Sunday 20 October

**11.30 – 12.30pm**
*Holywell Cemetery, Longwall St, OX1 3TP*

**2.30 – 3.30pm**
*St Sepulchre’s Cemetery, Walton St, OX1 2HD*

Pre-book, PWYD

Adults, teenagers

Walk

The wide range of rock types used for gravestones means that cemeteries can be geological treasure-troves. They are also great places to study local history and environmental science. Join geologists Nina Morgan and Philip Powell on a guided geological cemetery walk. Be prepared to walk on rough ground so please wear comfortable walking shoes.

May not be suitable for wheelchair users.

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**Poetry of science**

Sunday 20 October

**12.30 – 1.30pm**
*Oxford Town Hall, St Aldate’s, OX1 1BX*

Pre-book, PWYD

All ages

Talk, Performance

From acrostic and shape poems to sonnets and free verse, there are endless forms of poetry to suit the myriad topics in science. Join local poet Kelley Swain and Niall Munro from The Oxford Brookes Poetry Centre and several young finalists from the IF Oxford Poetry of Science Competition to hear their winning poems.
Evil cyborg sea monsters

Sunday 20 October
2 – 3pm

Oxford Town Hall,
St Aldate’s, OX1 1BX
Pre-book, PWYD
Teenagers, Adults
Talk

Join New York-raised, London-based comedian and cartoonist Mike Capozzola for a multimedia comedy show about superheroes, sci-fi, and monsters. If you’re a fan of Star Trek, Star Wars, Batman, Spiderman and time travel, then fly, beam or conjure yourself to this show! Mike has been featured at theatres, comic cons, science museums and comedy festivals around the globe. “Brilliant... with a dry sense of humor” San Francisco SketchFest

Suitable for age 12+

Capozzolla’s cartoon creatures

Sunday 20 October
3.30 – 4.30pm

Oxford Town Hall,
St Aldate’s, OX1 1BX
Pre-book, PWYD
Family
Workshop

Cartoonist Mike Capozzola needs your help to create some cartoon creatures! Brainstorm your ideas of what the most wonderful, whimsical or just plain weird creatures might look like and Mike will bring them to life before your eyes in cartoon form. It’s part imagination exercise and part cartoon lesson.

Suitable for children aged 5 – 9 years, who must be accompanied by an adult.
Choral Evensong

Sunday 20 October
3.30 – 4.30pm

University Church,
High Street, OX1 4BJ
Unticketed, Free
Adults, Teenagers
Performance

The first of two spiritual events for IF Oxford this Sunday. St Mary’s, or the University Church, is one of Oxford’s best-known landmarks that offers a reflective service of music, readings and prayers on weekdays and Sundays. Everyone is welcome to join and experience this short Christian event inspired by centuries of traditional worship alongside current affairs and inclusive values. This service will feature a Festival address by Alister McGrath, Professor of Science and Religion at the University of Oxford.

Choral Contemplation

Sunday 20 October
5.30 – 6.30pm

Somerville College Chapel,
Woodstock Rd, OX2 6HD
Unticketed, Free
Adults, Teenagers
Performance

The second of two spiritual events for IF Oxford this Sunday. Hear the Somerville College Choir alongside an ‘undenominational’ thought-provoking service in the Chapel described as ‘A House of Prayer for all People.’ Choral Contemplation takes place year-round and this special event highlights themes connecting science and the emotional response to music with philosophy and reflection.
Brain diaries

Sunday 20 October
7 – 8pm

Wig and Pen,
9-13 George St, OX1 2AU
Pre-book, PWYD
Adults, Teenagers
Talk

Richard Raynor’s world was turned upside down at the age of 31, when a massive stroke left an enormous chunk of his speech, language and memory missing. In this vibrant, colourful and entertaining talk, Richard describes the day of his stroke, his recovery, intensive rehabilitation, and involvement in world-leading neuropsychology research. Associate Professor of Experimental Psychology, Nele Demeyere, explains how thousands of people have been studied by scientists, and the breakthroughs achieved through neuropsychological studies.

“This festival is the best thing to do in Oxford. Your brain lights up for the whole evening”

Festival visitor 2018
Maths: It’s all Greek to me!

Monday 21 October
6 – 7pm

New Road Baptist Church,
Bonn Square, OX1 1LQ

Pre-book, PWYD

Adults, Teenagers

Talk

You’ve heard of Pythagoras, Archimedes and Plato, but do you know the sins behind their stories? From murder and deceit to running naked down the street, the Ancient Greek mathematicians were anything but boring. The ‘Naked Mathematician’ Dr Tom Crawford tells you all about their mischief – mathematical or otherwise – as he brings the history of maths to life (with live experiments).

Suitable for age 12+

Gene therapy for rare diseases

Monday 21 October
6.30 – 7.30pm

Oxford Deaf and Hard of Hearing Centre, 10 Littlegate St,
St Ebbes, OX1 1RL

Pre-book, PWYD

Adults, Teenagers

Talk

Breakthroughs using gene therapy and gene editing are regularly in the news, but in reality how close are we to them being used to treat actual patients? Professor of Gene Medicine, Deborah Gill sorts the fact from the fiction as she discusses how viruses are being re-purposed to treat rare diseases such as leukaemia, blindness and haemophilia.
Clearing the Air

Monday 21 October
7 – 8pm

Waterstones Bookshop,
Broad Street, OX1 3AF
Pre-book, PWYD
Adults, Teenagers
Talk

Award-winning sustainability journalist Tim Smedley has travelled the world to major cities dealing with severe air pollution problems including Delhi, Beijing and Paris, interviewing scientists and politicians to discover the full story of air pollution. Join Tim to discover what air pollution is, where it’s coming from and, most importantly, what we can do about it.

The ethics of artificial intelligence

Monday 21 October
7.30 – 9pm

Clore Old Library, University Church, High Street, OX1 4BJ
Pre-book, PWYD
Adults, Teenagers
Talk

The brave new world of artificial intelligence is coming to a mobile phone, hospital or a supermarket near you. What are the challenges and opportunities autonomous systems may bring as they are more deeply integrated within our human experience? Join this conversation between the Rt Revd Steven Croft, the Bishop of Oxford, and Professor Luciano Floridi, Professor of Philosophy and Ethics of Information, University of Oxford.
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### Who cares about old pictures?

**Monday 21 October**  
7.30 – 8.30pm

**Wig and Pen, 9 – 13 George Street, OX1 2AU**

- Pre-book, PWYD
- Adults, Teenagers
- Talk

What happens when you excavate the image archives of the Institute of Archaeology and other departments of the University of Oxford? The answer: you find amazing pictures that tell unexpected stories. Most of the pictures are black and white and 70 or more years old. Discover Oxford through a new lens with Janice Kinory to explore the Historic Environment Image Resource Project digital image archive, where the images are stored, and how you can access them.

### Are my immune cells giving me heart disease?

**Monday 21 October**  
8 – 9pm

**Oxford Deaf and Hard of Hearing Centre, 10 Littlegate St, St Ebbes, OX1 1RL**

- Pre-book, PWYD
- Adults, Teenagers
- Talk

Jump into the world of veins and arteries with Dr Naveed Akbar to map out how your immune system might combat or cause illness. Did you know that our immune system causes further damage following a heart attack or stroke? Take on the roles of a doctor diagnosing a patient, or the body’s messengers that communicate between your cells during the process of healing in this light-hearted, interactive talk.
Music and the mind

Tuesday 22 October
5.30 – 7pm

Somerville College,
Woodstock Rd, OX2 6HD
Pre-book, PWYD
Adults, Teenagers
Performance

What makes a simple tune become an anthem that causes skin to tingle, makes hearts beat faster, or brings some people close to tears? Join Professor of Experimental Neuropathology, Daniel Anthony and a host of music and experiments that highlight the power that music has over mood, physiology and the mind.

Attendees are welcome to stay for a drinks reception following the Q&A.

Jurassic brain-teasers

Tuesday 22 October
6.30 – 7.30pm

Oxford University Museum of Natural History, Parks Road, OX1 3PW
Pre-book, Free
Adults, Teenagers
Talk

Palaeontology was once considered dry and dusty, but recent advances in computer technology have transformed how fossils are studied. Integration with virtual reality, digital reconstruction and computer simulations brings huge potential for reconstructing fossil organisms and ecosystems including dinosaur brains. Stephan Lautenschlager, the 2018-19 Palaeontological Association exceptional lecturer, shows how new techniques are illuminating Earth’s prehistory.
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**Physics: Lab to life**

Tuesday 22 October
**6.30 – 9pm**

*Clarendon Laboratory, Parks Road, OX1 3PU*

Pre-book, PWYD

Adults, Teenagers

Tour, Talk, Hands-on

Physics is changing your life. At the University of Oxford’s Department of Physics, our research spans everything from the tiniest particles to the entire cosmos, but we don’t just leave the ideas scrawled on blackboards, hidden on hard drives or tucked into unfathomable scientific papers. We take our research and make it work for you.

Tonight’s event includes lab tours, talks and demonstrations featuring next-generation solar cells, quantum computers and BBSRC’s 2019 Innovator of the Year, Professor Achillefs Kapanidis.
Let There be Light

Tuesday 22 October
6.30 – 8.30pm

Ultimate Picture Palace,
Jeune St, Cowley Rd, OX4 1BN
Pre-book: £9.50 adults / £8.50 seniors / £8 students and claimants
Adults, Teenagers (Rated 15)
Film Screening

This is the 100-year journey to fusion: an award-winning documentary that follows the story of dedicated fusion scientists working to build a small sun on Earth, which would unleash perpetual, cheap, clean energy for mankind. The screening will be followed by a Q&A session featuring fusion researchers.

UPP Members receive a further £2 off listed prices.

Out of this world - science cabaret

Tuesday 22 October
7.30 – 9.30pm

Wig and Pen
9-13 George St, OX1 2AU
Pre-book, PWYD
Adults
Performance

Grab a pint and join Science Oxford for a cabaret with a difference as six stellar acts take you out of this world with their entertaining riffs on life at the edge of existence. From outer space to the dinosaurs, we’ll be rocketing through a medley of music, comedy and creativity that’ll keep you weightless with laughter all night. If you love science, solar systems and stand up, this cabaret should be right up your Milky Way. Featuring Chris Lintott (BBC Sky at Night) and Lucy Rogers (Robot Wars).
111 – one hundred and eleven

Tuesday 22 October
7 – 9pm

The Old Fire Station
40 George Street, OX1 2AQ

Pre-book: £12

Adults, Teenagers

Performance

A powerful duet between two exceptional dancers – Joel Brown, Candoco Dance Company, and Eve Mutso, former Principal Dancer of Scottish Ballet – as they explore their different strengths and vulnerabilities. 111 is the imaginary number of vertebrae that Joel and Eve have between them: Eve “moves like she has a hundred”; Joel’s spine is fused and he jokes he only has 11.

The performance will begin with a new piece created by Parasol Dance Group and will be followed by a Q&A with the performers, a medical researcher and inclusive youth project workers.

“one of the 12 best shows at Edinburgh fringe 2019”
The Guardian

“Visually striking ★★★★★”
The Herald

“Poignant, moving and forward-facing choreography”
Fjord Review
Learning languages is fun!

Wednesday 23 October
5.30 – 7pm

Oxfordshire County Library, Westgate Oxford, Queen Street, OX1 1DJ
Unticketed, Free
Adults, Teenagers
Workshop

Cześć! 你好! Bonjour! Olá!

Explore ideas about language learning and taste some different languages from around the world at this interactive session.

Making faces

Wednesday 23 October
6.15 – 7.45pm

The Place to Eat
John Lewis and Partners
Westgate Oxford, Queen Street, OX1 1PB
Pre-book, PWYD
Adults, Teenagers
Talk, Performance

Your appearance depends on who’s viewing. Contouring, volumised lashes and a smokey eye change a look, but can it trick facial recognition software? Explore makeup artistry from Charlotte Tilbury and City of Oxford College to see how much faces can change. People are more than just selfie, so join Niki Trigoni from the University of Oxford Cyber Physical System Group for the latest in multimodal recognition that can combines faces with voice and walking gait to help spot the whole person.
In our blood

Wednesday 23 October
6.30 – 8pm

New Road Baptist Church
Bonn Square, OX1 1LQ

Pre-book, PWYD

Adults, Teenagers

Talk

Is it our social responsibility to vaccinate? Vaccination has eradicated deadly diseases from our world and saved millions of lives; but why do some people refuse to vaccinate? This event, presented in partnership with the Wellcome Centre for Ethics and Humanities will explore how medicine, ethics, history and social science can encourage wider debate and a better understanding of the role vaccination plays in improving global human health.

The Dinosaurs Rediscovered

Wednesday 23 October
7 – 8pm

Waterstones Bookshop
Broad Street, OX1 3AF

Pre-book, PWYD

Adults, Teenagers

Talk

In this fascinating overview, renowned paleontologist Michael J. Benton reveals how our understanding of dinosaurs is being transformed by recent fossil finds and new technology. Secrets locked in prehistoric bones including the colour of dinosaurs, the force of their bite, their top speeds, and even how they cared for their young have now been revealed. Will we ever be able to bring them back to life? Although extinct, dinosaurs are still very much a part of our world.
The Breakup Monologues with Rosie Wilby

Wednesday 23 October 7 – 8pm
The Bullingdon, 162 Cowley Road, OX4 1UE
Pre-book, PWYD
Adults
Talk

Join the audience for a chat show and podcast recording hosted by award-winning comedian and author Rosie Wilby. With evolutionary anthropologist, Anna Machin, historian Sally Holloway and science communicator Charvy Narain, Rosie unpicks the neuroscientific and cultural implications of heartbreak, divorce and ghosting. Seasons 1 and 2 of The Breakup Monologues are available on all good podcast platforms. Recommended by Metro, The Observer, Time Out and Chortle.
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Heroes and Villains: changing perceptions of military veterans through poetry

Wednesday 23 October 8 – 9pm

The Old Fire Station Café
40 George Street, OX1 2AQ
Pre-book, PWYD
Adults, Teenagers
Talk, Performance

For many people, veterans are either heroes – overcoming great odds and traumatic experiences in the service of their country – or villains, killing others to advance foreign policy goals. This event, hosted by Oxford Brookes Poetry Centre, challenges these simplistic perceptions by presenting writing by US and UK veterans and exploring how and why the work was written.

The maths of tattoos

Wednesday 23 October 8.30 – 9.30pm

The Bullingdon,
162 Cowley Road, OX4 1UE
Pre-book, PWYD
Adults
Talk

Do you like maths? Do you like maths so much that you would get a maths-themed tattoo? How about 6? Come and hear from the ‘Naked Mathematician’ Dr Tom Crawford as he explains the meaning behind his many maths-themed tattoos. Topics covered include the most beautiful equation in maths, one-sided bridges that never end, Plato’s explanation of the universe, and a question with an answer worth $1 million…
Introduction to coding

Thursday 24 October
6 – 8pm

Oxfordshire County Library,
Westgate Oxford, Queen Street,
OX1 1DJ
Pre-book, Free
Adults, Teenagers

Workshop

Want to learn computer coding but don’t know where to start? Find out how to get going with a micro:bit or Raspberry Pi and have some digital fun.

Bring your own laptop. For adults and children over 8 years. Children must be accompanied by an adult.

Who are you?

Thursday 24 October
6.15 – 7.45pm

The Place to Eat,
John Lewis and Partners,
Westgate Oxford, Queen Street,
OX1 1PB
Pre-book, PWYD
Adults, Teenagers

Talk

How do your choices in music and fashion influence and represent who you are? Get insights on the social psychology of music from Adam Lonsdale, Senior Lecturer at Oxford Brookes University, and pick up some tips from the John Lewis and Partners Personal Stylists. Explore techniques of curating a look, drawing inspiration from your musical tastes, hobbies and leisure-time favourites, and how this links with your social life.
Big data, big ideas

Thursday 24 October
6.30 – 8pm

New Road Baptist Church,
Bonn Square, OX1 1LQ
Pre-book, PWYD
Adults, Teenagers
Talk

Big data and AI are starting to feature in cancer research today, and will play an even greater role in the future. Join researchers from Cancer Research UK to discover the technologies and methods they use to help find, prevent and treat cancer, and what big ideas they have for the future.

Speed dating with ideas

Thursday 24 October
7 – 9pm

Waterstones Bookshop,
Broad Street, OX1 3AF
Pre-book, PWYD
Adults, Teenagers
Talk

Join Oxford University Press for a special science-themed “speed dating” event. Mingle with a range of topics, including reptiles, psychopathy, environmental law, synaesthesia and circadian rhythms with expert authors from the Very Short Introductions series. Make an impression and get your questions in before the bell rings!
I have always been in tune with nature, although growing up in the densely-populated Singapore meant spending time in the natural world wasn’t a prominent part of my childhood. As an undergraduate student, I spent more time in forests and felt the importance of preserving and protecting the environment, and spreading the word too. Both things are very important to me.

The diversity and dynamism of biology is fascinating: the animal kingdom and the way different species interact with one another, and the spaces they live in, are always changing. For me, it’s bigger and more interesting than purely lab-based science. The incredible intricacy and complexity from molecular processes to individual animals and populations and how they interact, through to whole ecosystems, are all interrelated. One example from my research is the way sibling relationships affect aggression in male animals when competing for mates. Both fruit flies and chickens are less aggressive towards a brother compared with strangers and we know similarities in genetics are influencing this behaviour.

Education is a very powerful tool in conservation and I enjoy using innovative ways of teaching and exploring people’s attitudes to ultimately help save the world! I’m running an escape room in the Festival this year with a creative instructional designer, Ran Peleg. Here, small teams solve puzzles related to food purchases in a supermarket, facing problems of palm oil and illegal animal transportation before winning back their freedom. It’s a fun, immersive experience that gives players an insight into the problems confronted by consumers, animals and researchers along the way.
Another game, called *Global Carnivore Conservation*, is a board game developed by my colleague, Jennifer Spencer, and I that challenges players to travel the world gathering resources to solve real-life scenarios for conservationists, the animals themselves, or the indigenous people who live with them. The goal is to save six species, including the Asian clouded leopard, the African lion, the South American spectacled bear and the UK’s water vole, before climate change and other challenges to their natural habitats drive them to the extinction. These are all endangered animals that we research at WildCRU and we are seeking ways to prevent their populations further diminishing.

Related events

- Immersed in conservation  ► See page 15  Sat 19 October
- Storytime – natural world  ► See page 18  Sat 19 October
- Board game café  ► See page 59  Mon 28 October

The relentless approach of better times

Thursday 24 October  7 – 8.30pm

Oxford Deaf and Hard of Hearing Centre, 10 Littlegate St, St Ebbes, OX1 1RL

Pre-book, PWYD
Adults, Teenagers
Performance

Join musician and Oxford Contemporary Music Boom Artist Emma Smith for a multimedia live performance. Using double bass, loops and visuals, she’ll explore the geopolitical landscape in which we find ourselves and ways to connect and feel grounded in times of trauma, chaos and mass migration.
The Annual Charles Simonyi Lecture

Friday 25 October
5 – 6pm

Oxford Playhouse,
11-12 Beaumont Street,
OX1 2LW
Pre-book, £7
Adults, Teenagers
Talk

Join Marcus du Sautoy and a specially invited guest lecturer for this year’s Simonyi lecture. Aimed at the general public, the lecture is the highlight of the University of Oxford’s programme to engage the public in the excitement and wonder of science.

Fe Fi Fo Fum: battle for the iron crown

Friday 25 October
6.30 – 8pm

New Road Baptist Church,
Bonn Square, OX1 1LQ
Pre-book, PWYD
Adults, Teenagers
Talk

From the geological component of a life-supporting planet, to changing how we made tools or helping your body survive every day, iron plays an important part in being human. But which of iron’s roles is the most important? Join us for a fun evening where researchers from across the sciences and humanities (Fe)rociously try to persuade you that their use of iron is the most important. Who wins this battle of the new iron age? You decide!
Superheavy
Friday 25 October
7 – 8pm

Waterstones Bookshop,
Broad Street, OX1 3AF
Pre-book, PWYD
Adults, Teenagers
Talk

Marking the 150th anniversary of the periodic table, Kit Chapman reveals the incredible and often surprising stories behind the discovery of the superheavy elements; how they have shaped the world today and where they will take us in the future. Be introduced to the amazing people whose tireless quest to drive the periodic table forwards has led to scientists rewriting the laws of atomic structure.

The Most Unknown
Friday 25 October
7 – 9pm

Science Oxford Centre Theatre
Stansfeld Park, Quarry Road
Headington, OX3 8SB
Pre-book, PWYD
Adults, Teenagers (Rated 13)
Film screening

This mesmerising and entertaining film reveals the true potential of interdisciplinary collaboration, pushing the boundaries of science storytelling. Nine scientists visit extraordinary places to uncover unexpected answers to some of humanity’s biggest questions. How did life begin? What is time? What is consciousness? How much do we really know? By introducing researchers from diverse backgrounds for the first time, this deeply human trip to the foundations of discovery reminds us that the unanswered questions are the most crucial.
“So what is it that you ACTUALLY do?” is a typical question to researchers. During my zoology doctorate, I learned to explain research to a wide range of people and in 2014, took part in the international science communication competition called FameLab. I won the contest in Poland, my home country, which led to new collaborations – writing popular science articles, talking on radio and TV, and even doing science stand-up comedy – forming a broad portfolio career.

What used to be a hobby led to my first permanent job at Oxford University, now combined with lecturing in zoology at the University of Reading. These two jobs complement each other: a scientific background is useful for supporting research communication; and stand-up comedy techniques help in my lecturing role.

Straddling two countries has shown me the value of international collaboration, highlighting differences in approach towards science and its communication. The UK has a well-established science engagement landscape and places like Poland have creative and inspiring grassroots initiatives. I hope the recent twinning of Oxford and the Polish city of Wrocław will lead to a rich exchange of know-how in cultural and scientific areas.

One of the great things about IF is that it reaches out to different parts of Oxford, both demographically and geographically, from the Town Hall to Templars Square – please stop by to explore the research, or simply to say hello!

Related events

How do babies feel pain?
► See page 21
Sun 20 October

Out of this world – science cabaret
► See page 8
Tue 22 October

Build your medicine catapult
► See page 51
Sat 26 October
The Crowd and the Cosmos

Friday 25 October
6.30 – 8pm

Wig and Pen
9 – 13 George Street, OX1 2AU
Pre-book, PWYD

Adults, Teenagers
Talk

Scientists need your help! As we get more information about the Universe, we risk becoming overwhelmed but – as Oxford astronomer Chris Lintott explains in his new book – you can help. Hear from Oxford scientists who have worked with volunteers to find planets, count penguins and even hunt aliens.
Science Oxford – geology rocks

Saturday 26 October
10 – 11.30am, 12.30 – 2pm, 2.30 – 4pm

Science Oxford Centre,
Stansfeld Park, Quarry Road,
Headington, OX3 8SB
Pre-book, £9.07 inc booking fee
Family Workshop

Young geologists, grab your trowel and head out for this rock-themed workshop. We’ll crack open history and learn about some of the great scientific explorers through geo-challenges like panning for gold, studying real moon rocks and making fossils.

Suitable for ages 5-9. Must be accompanied by an adult.

The brain escape

Saturday 26 October
10.30am, 11.30am, 12.30pm, 1.30pm, 2.30pm, 3.30pm, 4.30pm, 5.30pm

The Old Fire Station,
40 George Street, OX1 2AQ
Pre-book, PWYD
Adults, Teenagers
Hands-on, Escape room

Can you find the key to break out of this escape room? Along the way you will solve a series of brain-related puzzles and learn about magnetic resonance imaging (MRI) – a technique we use to look inside the brain. But watch out: only by understanding the secrets of the brain will you escape!

Suitable for age 11+. Maximum 7 participants per 45 minute session. Please arrive 15 minutes before start time. Unclaimed tickets will be re-allocated 5 minutes before sessions start.
Incredible you

Saturday 26 October
12 – 4pm

Oxfordshire County Library,
Westgate Oxford, Queen Street,
OX1 1DJ

Unticketed, Free
Adults, Family

Hands-on

Discover the surprising beauty of your body at a tiny scale and get creative! Science-based artist, Dr Lizzie Burns shares her drawings inspired by biology under the microscope. Either produce your own drawings, or bring Lizzie’s to life by adding colour whilst you find out how pathologists help diagnose and treat disease. All creations can be taken home. Funded by the Royal College of Pathologists.

Fake new world

Saturday 26 October
2 – 4pm

Café Rouge
11 Little Clarendon Street,
OX1 2HP

Pre-book; PWYD
Adults, Teenagers
Talk

A practical guide for the enquiring mind. Fake is real: from the Chernobyl apocalypse to cancer cures; how to know the truth behind the headlines? Join medical science communicator Catarina Amorim and mathematician Joana Andrade from the Storytelling Science Project for a fun afternoon on how to be a curious and critical thinker. We can’t promise you’ll never be tricked again but we can try. Alternatively, come for the bingo...

Suitable for age 15+
As a former primary school teacher, I’m always finding new ways to engage young people with the amazing science of our planet and the world around them. I now work with children, their teachers and families in so many different settings, where I see the eureka discovery moment more than ever.

Stories and hands-on activities are great ways to inspire individual discovery, giving people of all ages freedom to play, explore and test things for themselves. The Geology Rocks workshop involves panning for gold, making fossils and, through story-telling, meeting scientific explorers of the past two centuries.

There’s something about handling a rock, grains of sand or even a crystal that grounds us in the history of our planet. In this 50th anniversary year of the moon landings, I also wanted to include real moon rocks in our Festival workshop, not just so children can see what an off-planet rock looks like, but also to make a physical connection with the Apollo astronauts. These lunar geologists risked their lives collecting nearly 400kg of moon rock in the pursuit of knowledge.

Geology plays a part in Science Oxford’s own story. Our new Science Oxford Centre in Headington Quarry is the UK’s first indoor-outdoor science education centre for primary-aged children and their families. The old clay quarry provided brick-making materials in Oxford for at least a hundred years. Some of the pits are still visible but most have been transformed into ponds full of plants and wildlife in a 15-acre woodland for visitors to explore.

**Related events**

- **The Most Unknown**
  - See page 43
  - Fri 25 October

- **Geology Rocks**
  - See page 46
  - Sat 26 October

- **Brick by brick**
  - See page 58
  - Mon 28 October
Storytime – exploration

Saturday 26 October 3 – 4pm

Oxfordshire County Library, Westgate Oxford, Queen Street, OX1 1DJ

Unticketed, Free

Family

Storytelling

There are so many places to explore, close to home, in other countries and even out in space. Join storyteller Sarah Law for a journey of discovery, visiting familiar locations, exotic destinations and places beyond your wildest imagination!

Best suited to children aged 5 – 9 years. Children must be accompanied by an adult.

Gravestone geology

Sunday 27 October

11.30 – 12.30pm
Headington Municipal Cemetery, Dunstan Rd, OX3 9BY

2.30 – 3.30pm
St Mary and St John Churchyard, Cowley Rd, OX4 1UR

Pre-book, PWYD

Adults, Teenagers

Walk

The wide range of rock types used for gravestones means that cemeteries can be geological treasure-troves. They are also great places to study local history and environmental science. Join geologists Nina Morgan and Philip Powell on a guided geological cemetery walk. Be prepared to walk on rough ground so please wear comfortable walking shoes.

This event may not be suitable for wheelchair users.
Science at the Shops

Saturday 26 October
9am – 5pm

Sunday 27 October
10am – 4pm

Temples Square
Shopping Centre,
Pound Way, Cowley,
OX4 3XH

Unticketed, PWYD

Adults, Family, Teenagers

Hands-on

IF Oxford is taking over the Banks Court area of Templs Square shopping centre this weekend with an exciting selection of fun activities for all ages.

On Saturday, look under your skin and discover the secrets of the human body. Find out how medicines and vaccines work, and explore how to keep yourself healthy.

On Sunday, discover the wonders of space, experience physics through computer games, explore digital technology, try some mathematical puzzles and find out about innovative research in Oxfordshire.
**Saturday’s activities**

**Attack of the antibodies – vaccines and beyond**

Delve into the immune system! Discover how vaccines work and their importance to society. Play a Lego ‘herd immunity’ game, take the attack of the antibodies challenge, find out about HIV research and check your knowledge with a quiz!

*Department of Paediatrics*
*University of Oxford*

**Build your medicine catapult and decode your message**

How can we treat diseases that damage muscles and the brain? Learn how researchers sneak genetic drugs into diseased cells so they are efficient, safe to use, and not destroyed by the body’s own defence mechanisms.

*Department of Paediatrics*
*University of Oxford*

**Imaging brains, bones and body**

Peer beneath your skin. Use a smartphone to explore human anatomy. Look through the eyes of an imaging scientist: why use X-rays to look at bones, but ultrasound to look at babies? Talk to our scientists and discover the wonders of imaging science.

*Oxford-Nottingham Biomedical Imaging Centre for Doctoral Training*
*University of Oxford*

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**Take part in health research**

Even if you’re healthy, you can take part in NHS research studies, from drugs trials to filling out questionnaires to tests and scans. Guess which of our food examples has the most sugar, learn about the human body with our interactive model and talk to health professionals about taking part in research.

*NIHR Clinical Research Network*
*Thames Valley and South Midlands*

**The noise that keeps me awake**

From climate catastrophe to rogue robots, asteroids to pandemics, we are surrounded by nightmares that could end human life as we know it. What are the fears that actually keep you awake? How closely do our fears match the real threats to our existence?

*The Futures Thinking Network (TORCH)*
*University of Oxford*
Sunday’s activities

Apollo@50

50 years since people first walked on the moon, we’re still discovering more about it. Hold meteorites and moonrock today, program small robots to navigate around our moon map and imagine living on the moon for yourself.

STFC Rutherford Appleton Laboratory

Particle physics adventures with Minecraft

Explore a virtual model of the CERN laboratory and ATLAS experiment in the Minecraft computer game. Learn how we study the fundamental building blocks of the Universe using silicon particle detectors.

Department of Physics
University of Oxford

Maths carousel

Experiment with patterns, shapes and angles at a carousel of tabletop maths challenges and games that’ll get your brain buzzing. Fun for all the family, these intriguing puzzles will get you thinking, questioning, and hopefully smiling when you solve them!

Science Oxford

Illuminating research

Using X-rays 10 billion times brighter than the sun, Diamond is home to world leading multi-discipline research right here in Oxfordshire; from plastic eating enzymes to Moon rocks and jet engines. Come along and learn more with our hands-on exhibits.

Diamond Light Source

Managing your digital self

A visual exploration of the personal data routinely generated in daily life, through smart devices at home and various portable devices which surround every bit of your life on the go.

Department of Computer Science
University of Oxford
I work as an engineer for the ISIS Neutron and Muon Source, a particle accelerator based at the Rutherford Appleton Laboratory in Didcot. Scientists from the UK and all over the world visit the facility because of the wide range of experiments that they can perform on materials they wish to study, from testing new construction techniques to make safer aircraft to studying materials that could make hip replacement surgery more effective. I work in the controls group who design, maintain and upgrade systems that keep temperatures, pressures and other variables within certain limits to keep the facility working properly.

I was always interested in how things worked, but I didn’t see how these interests linked with engineering until after I took my GCSEs. I took A-Levels in electronics, physics and maths then studied at the University of Plymouth. I initially struggled, but became more confident the more I worked at it and graduated with a 2:1 Masters in Electrical & Electronic Engineering.

I really enjoy the job that I do, knowing that I play an indirect role in enabling all kinds of important research, so I look for opportunities to promote engineering, especially to children that might not know exactly what it is about. I took part in the Black Panther event in IF Oxford last year, talking about my career path and demonstrating magnetic levitation technology, which appears in the film, and explaining how it works in real life.

**Related events**

**Physics: Lab to life**

► See page 31  
Tue 22 October

**The science of Black Panther**

► See page 55  
Mon 28 October

**Engineering the future**

► See page 57  
Mon 28 October
BLAST!

Monday 28 October
11am – 4pm

Blackbird Leys Community Centre, Blackbird Leys Road, OX4 6HW
Unticketed, PWYD
Adults, Teenagers, Family
Hands-on

BLAST! is the Blackbird Leys Astronomy, Science and Technology zone, where you can see the stars in a Planetarium and get subatomic with Minecraft. Explore the mind with virtual reality and artificial intelligence or jump into the magic of movies and the wonder of science, with examples from Black Panther.

Virtual reality and real-world health

Virtual reality (VR) is often enjoyed as an immersive gaming experience. Find out how VR is also used in research to help build confidence and reduce stress in young people. Pop on a headset, test your reactions and see how your body responds.

Department of Experimental Psychology
University of Oxford
How our brain sees what AI can’t (yet)

Artificial intelligence (AI) can now solve problems, like recognising an animal or object in a photograph, almost as well as humans. Despite these exciting advances, AI can still be surprisingly stupid! See how easily current AI is fooled, and what makes our brains special (for now!)

*Department of Experimental Psychology*
*University of Oxford*

The science of *Black Panther*

Wakanda is an amazing place, with science and technology that looks like magic – but some of that science and technology isn’t far from becoming reality. Find out how we’re exploring our Universe, hold real meteorites and investigate how we could create levitating vehicles in real life!

*STFC Rutherford Appleton Laboratory*

Lights, camera, action!

Have you ever dreamed of being a film star, performing hair-raising stunts? Step out of reality and straight into a movie with green screen technology. Create your own action sequence and find out how visual effects are used in movie-making.

*Film Oxford*

The next generation of spacecraft heat shields

How do you safely get spacecraft into space, on to planets and back home when travelling at high speeds through different atmospheres? Learn how scientists are building and testing engines using wind tunnels, liquid crystals and infra-red cameras with our Virtual Reality laboratory.

*Department of Engineering Science*
*University of Oxford*

Particle physics adventures with Minecraft

Explore a virtual model of the CERN laboratory and ATLAS experiment in the Minecraft computer game. Learn how we study the fundamental building blocks of the Universe using silicon particle detectors.

*Department of Physics*
*University of Oxford*

Planetarium dome

Step into the Planetarium dome and discover how to navigate the stars, find out how the movement of the Earth creates night and day and observe how the sky changes through the seasons. Hear stories our ancestors told about the cosmos and how these relate to what we know today.

*STFC Rutherford Appleton Laboratory and Science Oxford*
Monday 28 October
11am – 4pm

City of Oxford College
Technology Campus
Cuddesdon Way, Blackbird Leys, OX4 6HN

Hands-on: Unticketed, PWYD
Workshops: Pre-book, PWYD
Adults, Family, Teenagers
Hands-on, Workshops

Drop into the College for this special half-term event where you can compare an Iron Age furnace with up-to-the-minute technology and have a go at maths challenges in the family hands-on zone. Want to try something new? Choose from workshops for adults and teenagers for a taster of electronics and circuits, carpentry, construction and forensic skills.

PWYD is Pay What You Decide
Drop-in activities
For families
11am – 4pm

Engineering the future
Discover the high performance computing involved in space technology, particle accelerators and helping us understand the Universe’s smallest building blocks. Today you can meet apprentices studying for a Digital and Technology Solutions Degree who are supporting the development of innovative new software and systems.

STFC Rutherford Appleton Laboratory

Maths carousel
Experiment with patterns, shapes and angles at a carousel of tabletop maths challenges and games that’ll get your brain buzzing. Fun for all the family, these intriguing puzzles will get you thinking, questioning, and hopefully smiling when you solve them!

Science Oxford

Diamond: an engineering gem
Diamond is an amazing material, however most people only think of diamond as a gemstone. Diamond actually has an impact on your everyday life in shaping the things around you, from being used to engineer your smart phone to use in lasers that cut sheet metal for cars.

Element Six

Crafty maths
Learn about fractals as you help to build a Menger sponge entirely from business cards and make origami cubes to take home. Fun for all the family with a dose of maths thrown in!

Department of Mathematics University of Oxford

Making metal – performing production
Experience the sounds, sights and smells of the furnace with this live demonstration of smelting. In this celebration of the human relationship with minerals, fire and metal, explore our ancient connection with copper, tin and iron. Speak to archaeological scientists and consider how the properties of these metals continue to shape our society today.

Department of Archaeology University of Oxford
Workshops
Suitable for age 13+

**Boxing clever**

11.15am – 12pm and 1 – 1.45pm

Wooden boxes are a great project for new woodworkers. Simple, yet elegant, they are easily constructed, and personalised, being either decorative or utilitarian. If you’re new to woodwork, you can learn how to start crafting a wooden nail box with our qualified carpentry teachers.

*City of Oxford College Technology Campus*

**Remains to be seen**

11.30am – 12.30pm, 1 – 2pm, 2.30 – 3.30pm

Become a detective and find all the clues to reveal the culprit in this ‘who dunnit’ multi-scenario mystery. In teams, participate in a series of challenges using specialised equipment and getting into the minds of the paramedics, nurses, forensic scientists and engineers. All might not be as it seems...

*Oxford Brookes University Outreach Team*

**Complete the circuit**

12 – 12.45pm, 2 – 2.45pm

This interactive workshop with Arduino boards will give you the opportunity to experience an easy-to-use electronic coding device and an opportunity to learn about engineering jobs.

*City of Oxford College Technology Campus*

**Mobile robots**

12 – 1pm, 1.30 – 2.30pm, 3 – 4pm

See how fun and rewarding it can be to experiment with and test your ideas as you build a robot that can follow a line. Working in small groups, learn and apply some basic electronics and programming skills, giving you a taste for the scope and versatility of robotics. No prior electronics or programming experience required.

*Students for STEM Access University of Oxford*

**Brick by brick**

12.30 – 1.15pm, 2.15 – 3pm

Learn how to build a pyramid out of bricks, using accurate measurements, trowel techniques, cement mixing and presenting the final construction.

*City of Oxford College Technology Campus*

**Light it up**

1.45 – 2.30pm, 3.15 – 4pm

Explore circuits and find out how to wire the lights in a house safely. This workshop covers the most popular lighting circuits and how they work around your own home. Discover more about electrical installation careers.

*City of Oxford College Technology Campus*
Board game café

Monday 28 October
11am – 3.30pm

Old Fire Station Café
40 George St, OX1 2AQ

Unticketed, PWYD

Adults, Teenagers, Family

Hands-on

Play a variety of science themed board games and meet the people who created them. Step into the shoes of researchers from different topics and experience their challenges and adventures. Have fun tackling scientific concepts as you pit your wits against family members. From wildlife and environmental conservation to averting disaster in a nuclear power station or saving a life on the operating table, there are games for all ages.

Only Expansion

Monday 28 October
11am – 12pm, 12.30 – 1.30pm, 2 – 3pm, 3.30 – 4.30pm

City of Oxford College
Technology Campus
Cuddesdon Way, Blackbird Leys, OX4 6HN

Pre-book, PWYD

Adults, Teenagers

Audio tour

Pick up your headphones and guide from the College reception.

▶ See page 5 for more information
Making better policy for children and their families

Monday 28 October
1.30 – 2.30pm

City of Oxford College
Technology Campus
Cuddesdon Way, Blackbird Leys,
OX4 6HN

Pre-book, PWYD
Adults

Talk

How do we make the best policy choices for our families when resources are stretched to breaking point? Mary Daly and Aaron Reeves (University of Oxford) and Sasha East and Deborah McIlveen (Blackbird Leys CDI) explore how shifts in government policy create new opportunities and challenges for families. What lasting changes might we make or consider as a community to help raise a healthy child?

What IF…? 2019

Monday 28 October
4 – 5.30pm

City of Oxford College
Technology Campus
Cuddesdon Way, Blackbird Leys,
OX4 6HN

Pre-book, PWYD
Adults, Teenagers

Performance

How often do we really listen to the voices of young people when change and development is organised by adults? In this co-created music performance, What IF... uses rap, spoken word and dance to tell you how it is growing up in southeast Oxford in 2019.

Audience response from What IF 2018: “Inspiring and life-affirming.” “It’s great to watch collaboration with young people at a local level.”
Food for thought

Monday 28 October
Drinks reception 7pm;
Meal 7.45 – 10pm

Somerville College
Woodstock Rd, Oxford
OX2 6HD

Pre-book, £40 by Mon 21 Oct

Adults

Meal, Talks

Join this gastronomic meat-free tour of the world whether you have something to celebrate, or just fancy a splendid meal in Somerville’s elegant dining hall.

This delicious five course dinner, paired with short talks throughout, explores the future of farming and innovations for sustainable nutrition.

Wine / soft drinks included.

No entrance exams, but dress to impress. Bring your thoughts to the table to tackle food security and take some culinary ideas home.

Menu

Pre-dinner reception
Prosecco or sparkling elderflower with Asian-inspired canapés

Starter
Falafel with bulgur wheat salad, toasted pitta and tahini dressing

Main
Avocado tempura taco with pickled cabbage, mango salsa and sour cream

Dessert
Lamington cake with fruit coulis and ice cream

Cheese
Goat’s cheese & wild mushroom arancini with a rich tomato ketchup and pickled beetroot

Post-dinner talk
Coffee or Rooibos tea
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My Festival Ideas

Share your ideas and feedback with us at:
www.if-oxford.com/feedback

IF Oxford will return in October 2020
Thank you

The Festival sends huge thanks to its collaborators, supporters, and talented individuals who volunteer to make the Festival possible. It could not happen without their time, creativity and enthusiasm.

In association with:  Principal supporter:

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IF Oxford 2019 is supported by

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IF Oxford is organised by Oxfordshire Science Festival (Charity 1151361), with Trustees and a small team that work year-round on the Festival.

Festival Director: Dane Comerford  Events Manager: Cathy Rose

Trustees: Ian Thompson, Georgina Ferry, Tim Hart, Rory Campbell.

Design: www.defynedesign.co.uk
The cover illustration this year represents the muscles in a face that create a smile, the digital connections surrounding us and the genetic code that makes you who you are.

For information and to book events, visit: www.if-oxford.com
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