



UNIVERSITY OF
CAMBRIDGE

Science Festival

9–22 March 2015

www.sciencefestival.cam.ac.uk

Public engagement

The Cambridge Science Festival is co-ordinated by the Public Engagement team at the University of Cambridge. Look out for our other events during the year.

11 – 13 September 2015

Open Cambridge

Open Cambridge is a weekend of tours, talks and walks which opens up the city to residents and visitors. The weekend culminates with a walk through the Colleges raising money for local charities. Visit: opencambridge.cam.ac.uk, twitter: @OpenCambridgeUK

19 October – 1 November 2015

Cambridge Festival of Ideas

The Cambridge Festival of Ideas explores arts, humanities and social sciences research through talks, performances, film screenings, hands-on activities and workshops for all ages. Visit: festivalofideas.cam.ac.uk, facebook at: [cambridgefestivalofideas](https://www.facebook.com/cambridgefestivalofideas), twitter: @camideasfest

Throughout the year

For details of public events throughout the year visit the What's On guide at: cam.ac.uk/whatson
For Museum and College opening times and charges visit: cam.ac.uk/visitors

Tips for attending the Festival

- Bookings are only required where mentioned and close 24 hours before the event takes place.
For events marked Pre-book*, book online at: sciencefestival.cam.ac.uk or by telephone: 01223 766766, phone lines are open from 10.30am to 4pm weekdays.
For all other events marked Pre-book, use the booking details provided in the event entry.
- You may be refused entry if you arrive after the event has started even if you have booked.
- Places may become available at events that are listed as fully booked. You are welcome to turn up prior to the start. We will fill available seats five minutes before the event commences.
- For drop-in events, places are allocated on a first-come first-served basis.
- Children under 16 must be accompanied by an adult at all times. Please observe the minimum age guidelines. For a number of events, those under the minimum age may not be admitted owing to the nature and content of the event.
- Cambridge Science Festival takes place in departments, Colleges and Museums across Cambridge each with their own character and level of accessibility. **Accessibility facilities are indicated on our maps (see p50) and further details can be found at: cam.ac.uk/disability**
- The Festival is hosted in working departments and is run by staff and student volunteers. We ask for your patience as we try to give you the best experience possible.
- All events are free unless otherwise stated.
- Your attendance at any Festival event signifies your agreement to comply with the following guidelines: sciencefestival.cam.ac.uk/attending

Please contact us if you would like all or part of this publication in large font, audio or Braille. Call us on 01223 766766 or email: csf@admin.cam.ac.uk

Welcome

Welcome to the twenty-first Cambridge Science Festival. The year 2015 is the UNESCO International Year of Light and Light based Technologies and we have some fascinating light-themed talks and hands-on activities on offer during the Festival fortnight.

Events will be recreating famous experiments which led to our understanding of light and colour, showing how light technologies are changing our understanding of biological processes and looking in depth at LEDs and the science behind the 2014 Nobel Prize in Physics.

Wonderfully, there is a solar eclipse during the Science Festival and we will be looking at whether solar radiation management is one solution to climate change.

We acknowledge and thank the University of Cambridge and our sponsors for their support of the Cambridge Science Festival. We invite everyone to explore world-leading science and hope you find it enlightening.

Bookings open Monday 9 February 2015 at 10.30am

Download the free Festival app

Search, book and organise your events and be the first to hear Festival news. Find the app on iTunes or Google Play.

Follow us online

Visit our website at: sciencefestival.cam.ac.uk for news and information and follow us on:



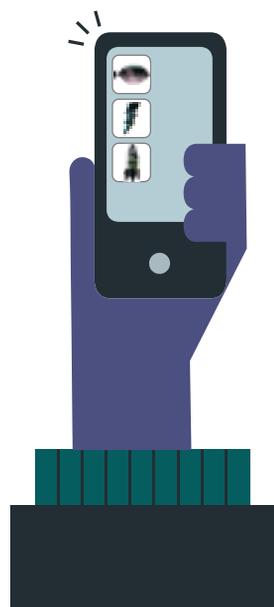
[facebook.com/cambridgesciencefestival](https://www.facebook.com/cambridgesciencefestival)



[#camscience #csf2015](https://twitter.com/camscience)

Tell us what you think

Your feedback is important to us. You will have the opportunity to give us your thoughts when you make a booking and at the Cambridge Science Festival. Visit: www.sciencefestival.cam.ac.uk/feedback





**FOR INTERNATIONAL
WOMEN'S DAY
8TH MARCH 2015
CAMBRIDGE JUNCTION**

**A DAY OF INSPIRATIONAL AND
THOUGHT PROVOKING TALKS, DEBATES,
PERFORMANCES AND WORKSHOPS**



**AUTHOR NATASHA WALTER, PART OF THE
HUMANITAS LECTURE SERIES**

**PLUS DISCUSSIONS ON WOMEN AND
SCIENCE, SPORT, HEALTH, EDUCATION,
MEN AND FEMINISM AND MUCH MORE**



WOW DURING THE SCIENCE FESTIVAL

- WOMEN IN BOTANY** PAGE 6
- ANNUAL WiSETI LECTURE** PAGE 6
**THE MOBILE REVOLUTION: FROM
M-HEALTH TO M-POWERING WOMEN**
- TALES FROM THE POLES:** PAGE 8
WOMEN IN ANTARCTICA
- WOMEN IN POLAR SCIENCE** PAGE 9
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DOES IT MATTER?



WOW is supported
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Throughout the Festival

With events featuring renowned international scientists and our stars of the future, the Science Festival is packed with talks, plays, discussions, films and tours.

This year, as well as fascinating talks and performances for older teenagers and adults, there are early evening talks for families. The Cambridge Junction brings new science-based theatre to the Festival and the University of Cambridge Museums host dozens of talks and tours throughout the next two weeks.

Highlights

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Monday 9 March

FameLab Cambridge final

Short snippets of fascinating research from stars of the future

Page 11 and Page 36

Thursday 12 March and Thursday 19 March

Cambridge Stars

Research highlights from our new Royal Society Fellows

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Monday 16 March

Out of the red and into the blue

From efficient lighting to water purification: the technology that won the 2014 Nobel Prize

Page 34

Wednesday 18 March

Light and colour

The great experiments that changed our understanding of light and colour

Page 37

Thursday 19 March

Einstein's legacy: 100 years of general relativity

The theory that changed our concept of space and time

BEFORE THE FESTIVAL

8pm–10pm, Friday 6 March

Cambridge Graduate Orchestra: Music, Mechanics and Machines

West Road Concert Hall, West Road, CB3 9DP
Cambridge Graduate Orchestra perform the concert *Music, Mechanics and Machines* with a pre-concert talk on the subject.

Event: 1, Map: 48, Performance,

All ages, Pre-book visit:

cambridgegraduateorchestra.com,
£12, £8 concessions, £6 children

12noon–3pm, Saturday 7 March

Science café Market Square

Café Mobile, Market Square, CB2 3PA

Join University of Cambridge scientists for a coffee break in the Market Square. Play spin the wheel of science to find out why animals do what they do, how solar systems are formed, and the chemistry of what you're made of. Our scientists will answer your questions and tell you about research going on in Cambridge and beyond!

Event: 2, Map: 40, Talk, All ages

9am–6pm, Monday 9 – Sunday 22 March

Future reactive: children's visions of physical activity

Art space in large corridor towards the Concourse, Addenbrooke's Treatment Centre, Cambridge Biomedical Campus, CB2 0SL

The Cambridge Institute of Public Health has teamed up with Addenbrooke's Arts to ask Cambridge children for their vision of an active future. This playful exhibition explores the idea of physical activity and how we can support an active future.

Event: 3, Map: 69, Exhibition, All ages

11am–1pm, Monday 9 March

Women in botany

Botanic Garden, Brookside, CB2 1JE

Christine Bartram of the University of Cambridge herbarium will explore the role of women in 19th Century botany using historic sources from the herbarium and rare books from the Cory Library.

Event: 4, Map: 3, Talk, Adults,

Pre-book tel: 01223 331875,

email: education@botanic.cam.ac.ukor visit: www.botanic.cam.ac.uk

Donations of £5, in aid of The Cambridge

Women's Resources Centre are invited

1pm–5pm, Monday 9 – Friday 13,
Monday 16 – Friday 20 March
10am–5pm, Saturday 14 – Sunday 15,
Saturday 21 – Sunday 22 March

Extreme engineering

Cambridge Science Centre, Jesus Lane, CB5 8BQ

Families! Engineering gets extreme at the Cambridge Science Centre's latest exhibition. Build and test your ideas as we celebrate engineering. Get hands-on and build towers, find out how engines work and discover the secrets of circuits.

Event: 5, Map: 7, Hands-on, All ages,
Normal admission charges apply

2pm–5pm, Monday 9 March

African scientists' research showcase

Pavilion Room, Hughes Hall, Mortimer Road,
CB1 2EW

Cambridge-Africa Programme and Hughes Hall

Presentations showcasing research conducted by African researchers with Cambridge colleagues.

Event: 6, Map: 25, Exhibition, Age 15+

5pm–6pm, Monday 9 March

Cambridge shorts: premiere event

Arts Picturehouse, St Andrews Street, CB2 3AR

Join us for the premiere of the second edition of our Cambridge Shorts film series. These exciting films, produced in collaboration between University of Cambridge researchers and filmmakers, focus on plant development, dementia, decision making and ancient stories about the Buddha's past lives.

Event: 7, Map: 2, Film, Age 12+, Pre-book tel:
087109025720 or visit: picturehouses.co.uk,
£1 booking fee

5pm–7pm, Monday 9 March

Annual WiSETI lecture: the mobile revolution

Wolfson Hall, Churchill College,
Storey's Way, CB3 0DS

Rachel McKendry, Professor of Biomedical Nanotechnology at UCL, speaks at this year's WiSETI's flagship event about her life and work. One of the aims of the lecture is to highlight the issues that particularly affect women in STEM and contribute to low retention rates in these subjects.

Event: 8, Map: 12, Talk, Age 15+,

Pre-book tel: 01223 765304,

email: equality@admin.cam.ac.ukor visit: equality.admin.cam.ac.uk

5pm–7pm, Monday 9 March,
Wednesday 11 March

Robogals: escape the zoo!

Department of Engineering, Reception,
Trumpington Street, CB2 1PZ

Help your robot quickly escape from the zoo. Using light sensors on Lego™ mindstorms robots to navigate, this workshop introduces programming concepts and basic robotics without typing any code. Hosted by Robogals Cambridge, this workshop is aimed at girls, but all are welcome.

**Event: 9, Map: 16, Workshop, Age 12+,
Pre-book email: esther@robogals.org.uk**

5.30pm–6.30pm, Monday 9 March

There's no business like flow business

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

Increasingly cells are providing us with answers. Scientists at the Babraham Institute carry out vital research on cells and cellular processes to learn how the body works and how it changes as we age. Dr Rachael Walker and Becky Newman explain flow cytometry and show how it takes us a step further in understanding cells and cell populations.

Event: 10, Map: 30, Talk, Age 15+, Pre-book*

6pm–7pm, Monday 9 March

Animals in time and space

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

Supported by Cambridge University Press

Professor Wallace Arthur takes us on a trip starting with familiar animals now to unfamiliar ones of the past and possible ones on other planets. He'll ask: what is an animal? How did animals become more complex over time? Which animals have survived space – not inside spacecraft but outside? Are there animals on exoplanets? And how many animal species are there on Earth?

Event: 11, Map: 30, Talk, Age 12+, Pre-book*

7pm–8pm, Monday 9 March

Fluorescence imaging: seeing the light

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

As scientists search for answers to questions that have eluded generations, they hunt for vital information that will take our knowledge further. Advances in science mean we can now shine a light on the unknown; we can literally make the invisible, visible. Dr Simon Walker and Dr Fatima Santos tell us how.

Event: 12, Map: 30, Talk, Age 15+, Pre-book*

7pm–10pm, Monday 9 March
FameLab Cambridge final

Cambridge Junction, Clifton Way, CB1 7GX

Sponsored by TTP Group

FameLab, the international science communication competition, comes to Cambridge. Join our finalists as they explain their research to a panel of judges: no presentations, limited props and all in just three minutes. Expect short snippets of fascinating research with perhaps a few puns thrown in!

**Event: 13, Map: 6, Performance, Age 12+,
Pre-book***

7.30pm–9pm, Monday 9 March

Beast in the studio, bird at sea

Judge Business School, Trumpington Street,
CB2 1AG

Join artists Ackroyd & Harvey, commissioned to work on the public art for the new Museum of Zoology and Cambridge Conservation Initiative building, in conversation with Professor Bill Sutherland and Steve Broad, Director of TRAFFIC. The discussion will follow the powerful conservation stories the artists have gathered and how this has shaped their work.

Event: 14, Map: 26, Talk, Age 15+, Pre-book*

7.45pm–9.15pm, Monday 9 March

Science meets faith

Nave, Wesley Methodist Church, Christ's Pieces
(from Short Street), CB1 1LG

In *The Grand Design*, Professor Stephen Hawking claims that the Universe needs 'no God to light the blue touch paper'. Professor Keith Ward discusses similarities between this book and Aquinas' *Five Ways of Demonstrating God* in this Science meets Faith talk at Wesley Methodist Church.

Event: 15, Map: 47, Talk, Age 15+, Collection

10.30am–4.30pm, Tuesday 10 – Saturday 21
March (excluding Sunday 15 and Monday 16

March), 12noon–4.30pm, Sunday 15 March

Sounding out the Morning Star: music in West Papua

Museum of Archaeology and Anthropology,
Downing Street, CB2 3DZ

An exploration of the social and political significance of sound and music in West Papua through objects collected in 1912-13 by Alexander FR Wollaston. The exhibition considers contemporary issues in West Papua through the perspective of the Lani Singers.

Event: 16, Map: 57, Exhibition, All ages

11am–12.30pm, Tuesday 10 March
Trap the light fantastic: plant to power

Botanic Garden, Brookside, CB2 1JE

Increasing demand for energy means that we need to invent new ways to generate power. Discover the emerging technologies behind Plant to Power, a prototype solar hub at the Botanic Garden

Event: 17, Map: 3, Talk, Adults,
Pre-book tel: 01223 331875,
email: education@botanic.cam.ac.uk
or visit: botanic.cam.ac.uk

1.15pm–2pm, Tuesday 10 March

**Of science and art:
 the Breslau Psalter**

The Fitzwilliam Museum, Trumpington Street, CB2 1RB

Dr Deirdre Jackson and Dr Paola Ricciardi from the Department of Manuscripts and Printed Books at the Fitzwilliam Museum discuss how the cross-disciplinary study of a richly illuminated 13th Century Psalter produced a clearer picture about the structure and authorship of the decoration.

Event: 18, Map: 39, Talk, Adults, Entrance token from the Courtyard foyer from 12:45pm

5pm–6pm, Tuesday 10 March

**Andrew Chamblin Memorial
 Lecture: colour, new dimensions
 and the geometry of physics**

Lady Mitchell Hall, Sidgwick Avenue, CB3 9DA

Professor Frank Wilczek from the Massachusetts Institute of Technology is one of the leading theoretical physicists of our time. Known for his discovery of asymptotic freedom, for which he received the Nobel Prize in 2004, his research ranges across particle physics, astrophysics and condensed matter physics.

Event: 19, Map: 28, Talk, Age 15+, Pre-book*

5pm–8pm, Tuesday 10 March

Sparkling science

Cambridge Regional College, Rooms C133 / C017, King's Hedges Road, CB4 2QT

Practical sessions in Physics and Chemistry focusing on light, followed by a talk. Physics: make a model spectroscope using a CD to investigate the components of light and their wavelengths. Chemistry: observe chemical reactions which produce light and investigate the effect of temperature on light sticks.

Event: 20, Map: online, Hands-on, Talk, Age 8+,
Pre-book tel: 01223 418580, email:
kedwards@camre.ac.uk or visit: camre.ac.uk

6pm–7.30pm, Tuesday 10 March

**Tales from the Poles:
 women in Antarctica**

Scott Polar Research Institute, The Polar Museum, Lensfield Road, CB2 1ER

Antarctica is one of the last frontiers on Earth. Hear stories from women working on the ice for the British Antarctic Survey. The panel discussion will end with a late-night opening of The Polar Museum until 9.30pm. Refreshments will be available.

Event: 21, Map: 43, Talk, Adults, Pre-book visit:
spri.cam.ac.uk/museum/events

6pm–7.30pm, Tuesday 10 March

What is the point of playing?

Donald McIntyre Building, Faculty of Education, 184 Hills Road, CB2 8PQ

Is play a way of learning, or merely a way to release excess energy? The Faculty of Education's Psychology & Education group will shed light on the topic. Dr Sara Baker, Dr David Whitebread and Dr Jenny Gibson, discuss types of play, purposes for play, and what might happen if schools stop play.

Event: 22, Map: 19, Talk, All ages

6.30pm–7.30pm, Tuesday 10 March

Molecules in solitary confinement

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

The environment has an impact on the behaviour of molecules as well as people. Professor Jonathan Nitschke designs nanometre-scale cages that self-assemble from simple building blocks. See how these molecular prisons trap guest molecules and prevent or enhance chemical reaction.

Event: 23, Map: 30, Talk, Age 12+, Pre-book*

6.30pm–7.30pm, Tuesday 10 March

Space on Earth

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

Supported by Cambridge University Press

Professor Monica Grady discusses how meteorites, fragments of asteroids, show us the processes and materials that shaped our solar system and planet.

Event: 24, Map: 30, Talk, Age 12+, Pre-book*

7pm–8pm, Tuesday 10 March

Creating Science Worlds

Cambridge Junction, Clifton Way, CB1 7GX

How do you begin making plays about science and why is theatre such an exciting medium for sharing ideas of science? Find out from the artistic director of theatre company Curious Directive.

Event: 25, Map: 6, Age 12+,
Pre-book visit: junction.co.uk

7pm–10pm, Tuesday 10 March
Is there a right diet for me?

Lady Mitchell Hall, Sidgwick Site
 Sidgwick Avenue, CB3 9DA

Join TV presenter Dr Chris van Tulleken to talk dieting with scientists from the recent BBC2 documentary *What's The Right Diet For You? A Horizon Special*. Explore the factors leading to weight gain, discover how diets work (and why they sometimes don't), discuss how we can manage our own weight better, and ask how we can tackle the rising issue of obesity.

Event: 26, Map: 28, Talk, Age 15+, Pre-book*

7.30pm–9.30pm, Tuesday 10 March
Polar Museum late night opening: women in polar science

Scott Polar Research Institute, The Polar Museum, Lensfield Road, CB2 1ER

Join us at the Polar Museum and meet women from the British Antarctic Survey who work at the Poles. Get a taste of their experiences working in the field and browse the museum after dark with a glass of wine.



BRITISH ANTARCTIC SURVEY

Event: 27, Map: 43, Exhibition, Adults, Pre-book visit: spri.cam.ac.uk/museum/events

8pm–9pm, Tuesday 10 March
What your Facebook says about you

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW
 Discover from Dr Alex Kogan the insights that can be gleaned about people's beliefs, values, and personalities from small bits of their Facebook data. Learn how these insights are beginning to transform the fundamental approach social scientists take to understanding human nature and societies.

Event: 28, Map: 30, Talk, Age 12+, Pre-book*

1pm–1.45pm, Wednesday 11 March
Sounding out the Morning Star: music in West Papua talk

Museum of Archaeology and Anthropology, Downing Street, CB2 3DZ

A talk by Dr Elizabeth Blake on the temporary display, *Sounding out the Morning Star: music in West Papua* (see p7).

Event: 29, Map: 57, Talk, Age 12+

1pm–2pm, Wednesday 11 March
From the old Botanic Garden to the New Museums Site: scientific collections in Victorian Cambridge

Whipple Museum of the History of Science, Free School Lane, CB2 3RH

The New Museums Site is one of the University's iconic locations, home to a fascinating variety of scientific work. In the 1860s the old Botanic Garden was transformed into the home of Cambridge's scientific collections on display in Salvin's Buildings. Dr Boris Jardine recovers the lost collections of these new museums and their role in debates about science in Victorian Cambridge.

Event: 30, Map: 49, Talk, Age 12+, Pre-book tel: 01223 330906, email: HPS-events@lists.cam.ac.uk

1.15pm–2pm, Wednesday 11 March
Of science and art: illuminated manuscript fragments

The Fitzwilliam Museum, Trumpington Street, CB2 1RB

The Fitzwilliam Museum has one of the largest and most important collections of fragments from medieval manuscripts in existence. A selection of these are undergoing examination to identify the painting materials and techniques used by the illuminators. Dr Giulia Bertolotti discusses the challenges posed by these beautiful objects as well as some unexpected results.

Event: 31, Map: 39, Talk, Adults, Entrance token from the Courtyard foyer from 12:45pm

3.30pm–4.30pm, Wednesday 11 March
Science based approaches to early education: the case of rhythm and literacy

Anglia Ruskin University, East Road, CB1 1PT

Teaching programmes based on scientific research are gaining popularity in primary school classrooms. In this talk, the experimental evidence underpinning the Tune Time programme will be outlined and wider implications in regards to the teaching of early literacy discussed.

Event: 32, Map: 1, Adults, Talk, Pre-book tel: 0845 196 5060, email: miriam.berg@anglia.ac.uk or visit: anglia.ac.uk/community





3.30pm–4.30pm, Wednesday 11 March

There is more to touch than meets the eye: the role of touch in consumer behaviour

Anglia Ruskin University, East Road, CB1 1PT

People are often unaware of how their tactile sense can be used to manipulate their consumer related behaviours and the evaluations that they make. Touch has the capability to influence many different consumer aspects, the actual value of a product and how attractive it is judged to be. This talk explains how our tactile sense contributes to how we perceive products and services.

Event: 33, Map: 1, Adults,

Pre-book tel: 0845 196 5060,

email: miriam.berg@anglia.ac.uk

or visit: anglia.ac.uk/community

6pm–7pm, Wednesday 11 March

Order out of chaos

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

Supported by Cambridge University Press

Suppose we have six people at a party. Any two are either friends or strangers. Can we always find three of them who are either mutual friends or mutual strangers? Professor Imre Leader introduces the mathematical theory of 'order out of chaos'.

Event: 34, Map: 30, Talk, Age 12+, Pre-book*

6pm–7pm, Wednesday 11 March

The barometer of life

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

Presented by the International Union for Conservation of Nature

Join the IUCN in a discussion on the Red List of Threatened Species which is a health check for our planet. The Red List categorises the global conservation status of animal, fungi and plant species and their links to livelihoods. It is a powerful tool to inform and catalyse action for biodiversity conservation and policy change, critical to protecting the natural resources we need to survive.

Event: 35, Map: 30, Talk, Age 15+, Pre-book*

6pm–7.30pm, Wednesday 11 March

Earth's past, present, and future climate

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

Explore Earth's dynamic climate with the Cambridge Centre for Climate Science. Hear from and discuss with a few of Cambridge's resident climate scientists, Professor Eric Wolff, Department of Earth Sciences, Dr Amanda Maycock, Department of Chemistry and Dr Emily Shuckburgh, British Antarctic Survey.

Event: 36, Map: 30, Talk, Age 12+, Pre-book*

8pm–9pm, Wednesday 11 March

The right to sustainable development?

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

The Cambridge Forum for Sustainability and the Environment (CFSE) and the Humanitarian Centre co-host this event focusing on the theme of a right to sustainable development and environmental protection.

Event: 37, Map: 30, Talk, Age 12+, Pre-book*

8pm–9pm, Wednesday 11 March

Engineering our climate

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

What are we going to do if our CO₂ reduction efforts don't work? Do we just accept the climate consequences of the CO₂ we generate – sea level rise, desertification, ocean acidification, loss of habitat – or do we fix the damage we are causing? Dr Hugh Hunt looks at one geoengineering solution, solar radiation management, and discusses the engineering challenges involved.

Event: 38, Map: 30, Talk, Age 12+, Pre-book*

8pm–9pm, Wednesday 11 March

How is the Universe like a lightbulb?

CB2 Café, Norfolk Street, CB1 2LD

... and what does that tell us? Join Michael Conterio (Robin Ince's Christmas Ghosts, The Cambridge Impronauts) for an hour of comedy exploring how physics links space stations and roundabouts, street lamps and exoplanets, and ice-cream and jet engines. You may know more physics than you thought!

Event: 39, Map: 10, Performance, Age 15+,

Pre-book visit: wegottickets.com/event/301242, £3.30



2.30pm–4.30pm (Schools' performance)

7.30pm–9.30pm (Public performance)

Thursday 12 March

Let Newton Be!

Cambridge Junction, Clifton Way, CB1 7GX

Commissioned by the Faraday Institute

Isaac Newton, a complex and controversial character who sought God in universal laws of light and motion, is brought to life. Explore the life and thought of a genius whose scientific theories still provide the foundations for our understanding of the Universe today.

Event: 40, Map: 6, Performance, Age 15+,

Pre-book for schools' performance tel: 01223

743018, or visit: faraday.st-edmunds.cam.ac.uk/

Pre-book for public performance tel: 01223

511511, email: tickets@junction.co.uk or visit:

www.junction.co.uk, £10, £6 concessions

5.30pm–6.30pm, Thursday 12 March

Obliterated: mapping the Great War

Milstein Seminar Rooms, Cambridge University Library, West Road, CB3 9DR

The maps of the Western Front in the Great War depicting trench positions provide a fascinating insight into the dramatic changes inflicted upon the landscape. Explore these changes, the influences they had on those who were there and how they are reflected in the landscape today.

Event: 41, Map: 9, Talk, Age 12+

5.30pm–6.30pm, Thursday 12 March

Some essential links between maths and the arts

Centre for Mathematical Sciences, Wilberforce Road, CB3 0WA

Professor John Barrow looks at links between maths and the creative arts and shows how smooth curves informed architecture and how text fonts were created.

Event: 42, Map: 62, Talk, Age 15+, Pre-book tel: 01223 766839 or visit: maths.org/events

6pm–7pm, Thursday 12 March

Vitamin D: to D or not to D?

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

We need sunlight to make vitamin D and people living in the UK generally have low vitamin D levels. Though vitamin D deficiency has been associated with increased risk of heart, musculoskeletal and lung diseases, optimal vitamin D levels are still controversial. Professor Kay-Tee Khaw discusses whether recent research sheds light on the question Vitamin D: to D or not to D?

Event: 43, Map: 30, Talk, Age 15+, Pre-book*

6pm–7pm, Thursday 12 March

Melioidosis: biothreat infection and paddy-field disease

Strathaird Building, Lucy Cavendish College, Lady Margaret Road, CB3 0BU

Professor Sharon Peacock is a clinical microbiologist in the Department of Medicine, and works closely with Public Health England and the Wellcome Trust Sanger Institute. In this talk, Professor Peacock shows how sequencing techniques can be applied to the study of Melioidosis, an infectious disease of tropical climates.

Event: 44, Map: 29, Talk, Age 15+, Pre-book*

6pm–7.30pm, Thursday 12 March

Cambridge stars: big ideas 1

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

Royal Society Fellows are the most eminent scientists and engineers in the UK and Commonwealth. In 2014, 11 new Fellows were elected from Cambridge. We welcome Martin Johnson, Emeritus Professor of Reproductive Sciences; Dr Julian Parkhill, Wellcome Trust Sanger Institute; Richard Hills, Emeritus Professor of Radio Astronomy and Dr Karalyn Patterson, Clinical Neurosciences to introduce us to their research.

Event: 45, Map: 30, Talk, Age 12+, Pre-book*

6pm–7.30pm, Thursday 12 March

How many light bulbs does it take?

The Open University, Cintra House, 12 Hills Road, CB2 1PF

This entertaining talk by Dr Stephen Peake of The Open University explores the history of lighting (from medieval candles to today's advanced LEDs) as a way of framing a much bigger technological and political question about sustainability. What might a low-carbon low-energy society look like and how do we get there?

Event: 46, Map: 41, Talk, Age 15+, Pre-book tel: 01223 584647, email: R06-Outreach@open.ac.uk

6pm–8.30pm, Thursday 12 March

Look what chemistry has done for me

Thomas Graham House, The Royal Society of Chemistry, Science Park, Milton Road, CB4 0WF

An informal and informative event from the Royal Society of Chemistry showcasing the experiences of chemists in academia and industry. This event offers an excellent opportunity to learn more about possible career options in chemistry.

Event: 47, Map: online, Talk, Age 15+, Pre-book tel: 01223 432159, email: thompsons@rsc.org



6.30pm–8.30pm, Thursday 12 March
The Naked Scientists live on BBC Radio Cambridgeshire

The Pitt Building, Trumpington Street, CB2 1RP

A live audience with the Naked Scientists: expand your mind and boost your brain power on a wild ride around science on BBC Radio.

Event: 48, Map: 42, Talk, Age 12+, Pre-book*

7pm–9pm, Thursday 12 March
Weight versus experience: the science of winning the boat race

Anglia Ruskin University, East Road, CB1 1PT

Sport and exercise scientists discuss the nutritional, physiological, psychological and biomechanical factors that contribute to the winning formula in a boat race crew.

Event: 49, Map: 1, Talk, Adults, Pre-book tel: 0845 196 5060, email: miriam.berg@anglia.ac.uk or visit: anglia.ac.uk/community

8pm–9pm, Thursday 12 March
The naked apes

Basement, CB2 Café, Norfolk Street, CB1 2LD

A science comedy show that addresses what it really means to be human. With low, middle and high-brow jokes, dodgy props and a slideshow. Featuring award-winning comedian Ben Clover and science presenter Geoff Marsh.

Event: 50, Map: 10, Performance, Adults, Pre-book tel: 07889 176050, or visit: wegottickets.com/event/296821, £5.50

8pm–9.30pm, Thursday 12 March
Get the best out of life: resilience and stress management organiser

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

We are busy people living in a competitive stressful world. How do we remain optimistic and resilient? Professor Barbara J Sahakian, Professor David Clarke and Allison Pearson show how to manage stress, get the most out of work and home-life and how to overcome problems of anxiety or depression.

Event: 51, Map: 30, Talk, Age 12+, Pre-book*

2pm–4pm, Friday 13 March
Insect pollinators

Botanic Garden, Brookside, CB2 1JE

Join experts from the Zoology Museum and get a closer look at some of the insect pollinators that orchids are dependent on. Then visit the orchid display in the Botanic Garden glasshouses.

Event: 52, Map: 3, Exhibition, Talk, Age 12+, Pre-book tel: 01223 331875, email: education@botanic.cam.ac.uk, £10

3pm–6pm, Friday 13 March
Through the eyes of scientists

PostDoc Centre, 16 Mill Lane, CB2 1SB

Photographs of scientists usually include white coats, small tubes of fancy blue liquid and puzzled expressions! But is this what they do everyday?

This exhibition of photographs gives a fresh perspective of what their working days are like.

Event: 53, Map: 34, Drop-in, Exhibition, All ages

6pm–7pm, Friday 13 March
Searching for intelligence in the legs: robots that walk, run and dance

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

Although there is enormous success in the use of robotic arms for the automation industry, robotic legs are very challenging to be engineered and used in our daily lives. Dr Fumiya Iida discusses why legs are so special, and whether we will see robots running around in the near future.

Event: 54, Map: 30, Talk, Age 15+, Pre-book*

6pm–7.30pm, Friday 13 March
How does work make you healthier?

Riley Auditorium, Clare College, Memorial Court, Queen's Road, CB3 9AJ

Supported by RAND Europe

Join Professor Dame Carol Black, Expert Adviser on Health and Work to the Department of Health, Dr Steve Boorman, Chair of the Boorman review of health and wellbeing in the NHS and Dr Chris van Stolk of RAND Europe, to explore how and to what extent the workplace can improve our health and wellbeing.

Event: 55, Map: 13, Talk, Age 12+, Pre-book*

7.30pm–9.30pm, Friday 13 March
Climate engineering: who can we trust?

Lady Mitchell Hall, Sidgwick Avenue, CB3 9DA

Climate engineering is a contentious issue in part owing to a perceived lack of progress on crucial emission reductions. Is it a dangerous distraction from the work needed to reduce emissions?

Or could solar radiation management be a straightforward way of mediating climate change?

Join Oliver Morton and Professors Martin Rees, Amartya Sen, Onora O'Neill and David Keith to find out more.

Event: 56, Map: 28, Talk, Age 15+, Pre-book*

Science on Saturday starts here!

Saturday 14 March

This is the busiest day of the Cambridge Science Festival with hands-on activities and talks for all ages. Use our maps, mobile app and guide on pages 14 and 15 to help plan your day. Ultimate π day, 3.1415 – March 14 2015 – means no pie but some great mathematically themed talks at the Mill Lane Lecture Rooms for older children and adults.

We return to the Cambridge Corn Exchange during the day with events for everyone to enjoy and re-open early evening for the first time just for adults. Then the choice is yours, we have science comedy in the Cambridge Union Society and science theatre at the Cambridge Junction.

Highlights

Page 16

Happy birthday, Fermat's last theorem

Simon Singh tells the (possibly) greatest story in the history of mathematics

Page 19

CSF@the Cambridge Corn Exchange: adults only!

Ask our scientists everything you've ever wanted to know and get investigating!

Page 27

The origin of species

The incredible story of Charles Darwin through music and puns from Tangram Theatre Company

Page 27

Festival of the Spoken Nerd

They're back and ready to 'talk nerdy' to us all!



Plan your perfect Festival: Saturday events at a glance

		9am	9.30am	10am	10.30am	11am	11.30am	12pm	12.3
Mill Lane Lecture Room 3	p16				57T Enigma*				58T Why
Mill Lane Lecture Room 1	p17				61T Light: with a twist*				
PostDoc Centre	p17			65H Translational					
The Pitt Building	p17			65H Translational					
University Centre	p17			65H Translational					
Cambridge Corn Exchange	p18/19			67H-82H					
The Guildhall	p20			84H-95H CSF@the Guildhall &					
Department of Chemistry	p21			98H					
Department of Chemistry	p21			99T Chemistry of light#					
Department of Pathology	p22			100H Cosmos of your body &					
Plant Sciences Marquee	p22			100H Cosmos of your body &					
Department of Geography	p22			100H Cosmos of your body &					
Department of Psychology	p22			103H Seeing and interacting with our world		104H Bird brain never more			
Department of Psychology	p23			103H Seeing and interacting with our world					
Sedgwick Museum	p23			103H Seeing and interacting with our world					
McDonald Inst for Arch Research	p23			103H Seeing and interacting with our world					
Physiology Building	p23					109T How the brain is built			
Anatomy Lecture Theatre	p23					110T Perception of colour			
Department of Biochemistry	p23			109T How the brain is built					
Museum of Arch and Anth	p23			109T How the brain is built					
Museum of Arch and Anth	p23			109T How the brain is built					
Downing Site	p23			109T How the brain is built					
Department of Zoology	p24			117T CHaOS Talks# (recommended age 8+)					
Department of Zoology	p24			119W Robogals#					
Whipple Museum of the Hist of Sci	p24			119W Robogals#					
St Columba's Hall	p25			121H Spacecraft*		121H Spacecraft*			
Christ's College	p25			121H Spacecraft*					
Grafton Shopping Centre	p25			121H Spacecraft*					
Museum of Classical Archaeology	p25			124H Lighting up the ancient world#					
The Polar Museum	p25			125H					
Cambridge Buddhist Centre	p25			125H					
Tourist Information Centre	p26			127GT Leading lights*					
Cambridge University Library	p26			127GT Leading lights*					
Department of Pharmacology	p26			128T Seeing further than others					
Keynes Hall, King's College	p26			130T Ideas and lang					
Cambridge Union Society	p26			130T Ideas and lang					
Gurdon Institute	p26			130T Ideas and lang					
The Fitzwilliam Museum	p27			130T Ideas and lang					
Cambridge Science Centre	p6			130T Ideas and lang					
Cambridge Junction	p27			130T Ideas and lang					

All ages **8+** **12+** **15+**

E Exhibition, **F** Film, **GT** Guided tour, **H** Hands on, **P** Performance, **T** Talk, **W** Workshop

Check event listing for booking information

Evening events:

83H Cambridge Corn Exchange: adults only* (p19)

137P Tangram Theatre Company: The Origin of Species# (p27)

138P Festival of the Spoken Nerd: talk nerdy to me# (p27)

0pm	1pm	1.30pm	2pm	2.30pm	3pm	3.30pm	4pm	4.30pm	After 5pm
do things stick?*			59T Don't believe this talk*				60T Fermat's Last Theorem*		
62T Brought to light*			63T Immunology*						
64E Through the eyes of scientists									
medicine									
66H Solar powered cars									
CSF@the Cambridge Corn Exchange									
96P You decide* & 97H Journey to Mars									
Chemistry in action									
			99T Chemistry of light#					99T Chemistry of light#	
101H Why snot & 102T Cambridge AWiSE									
105H Enlightened plants									
106H Splash and squelch									
			103H Seeing and interacting with our world		104H Bird brain never more				
			116T Ageing artists						
107H Time truck									
108H Science of archaeology									
			115T Unbelievable lightness of seeing						
111H On the right wavelength									
112H Life before artificial light									
			114T Printmaking under the southern Sun						
113T Science café									
& 118H Crash, bang, squelch#									
			119W Robogals#						
The quest for the curator's code*									
			121H Spacecraft*			121H Spacecraft*			
122E Betwixt truth and truth									
123H Science buskers									
Look into the Polar light: family day									
			126T/GT When universes collide						
			127GT Leading lights*						
129H Medicines under the microscope									
languages*			133W Language of light*						
			131T Sci Cam				135P Helen Arney*		138P see p27
			132H One body						
			134H Conservation conversations						
5H Extreme engineering									
									137P see p27

Top talks@Mill Lane Lecture Rooms

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

Map: 30, Talk, Pre book*

Saturday 14 March

JAMES GRIME



WIKI-COMMONS

10.30am–11.30am

Enigma and the secret world of code breaking

For as long as we have had secrets we have had secret messages. Dr James Grime looks at the fascinating history and mathematics of codes and code breaking – from ancient Greece to the present day – including a demonstration of an original WWII Enigma machine!

Event: 57, Age 8+

12.15pm–1.15pm

Why do things stick?

Stickiness is everywhere; from the glue that holds racing cars together to the jam in sandwiches. But have you ever wondered why things are sticky? With demonstrations of sticking to the ceiling and making glue from milk, Dr Ewen Kellar from TWI Ltd, unravels the mystery surrounding this really quite complex process. If you've ever wondered how geckos walk up glass walls, this talk is for you!

Event: 58, Age 8+

2pm–3pm

Don't believe this talk: maths that can't be true!

Some things are obvious, some complicated, and some are obvious until you speak to a mathematician. Steve Mould looks at maths that confounds expectations and laughs in the face of intuition. If you thought you knew the shape of a wheel or how to measure a coastline, think again. Find out how many numbers in the Universe start with 1, how to cheat on your homework and other mathematical surprises.

Event: 59, Age 12+

3.30pm–4.30pm

Happy birthday, Fermat's Last Theorem

In association with Skeptics in the Pub

Simon Singh, author of a book and director of a BBC documentary about *Fermat's Last Theorem*, discusses the origin of the problem, describes the heroes and villains who tried and failed to prove Fermat's Last Theorem, and tells the story of Professor Andrew Wiles, who conquered Fermat's challenge after working in secret for seven years. This is possibly the greatest story in the history of mathematics.

Event: 60, Age 12+

Science shorts@the Mill Lane Lecture Rooms

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW
Map: 30, Talk, Pre book*

11am–11.45am

Light: with a twist!

Light is fascinating because it brings colour to our lives and enables us to see. But it can also do some curious and unexpected things that are usually invisible. Join Rachel Hyman and Philip Garsed as they make the invisible visible with some exciting demonstrations, and explain how these effects are vital for modern technology, from computer screens to 3D cinema.

Event: 61, Age 8+

12.30pm–1.15pm, Saturday 14 March Brought to light: exploring the past and future of Earth's greatest resource

Mill Lane lecture rooms, 8 Mill Lane, CB2 1RW

Light has fascinated scientists for hundreds of years but what is it and how do scientists use light today to study matter? Dr Michael Wharmby of the Diamond Light Source, tells the story of light, explaining how its weird properties are crucial to modern science and technology. Using simple experiments that you can try at home, Michael explores the ways that light is used to study everything from cancer to jet engines and renewable energy.

Event: 62, Age 12+

2pm–3pm

What is immunology?

Your body defends itself against invaders (parasites, bacteria, viruses, cancers) all of the time. How does it know what to attack? How does it do it? Find out from Amy MacQueen and Saad Idris what diseases you get when your body goes wrong. Audience participation during this interactive talk will be greatly encouraged!

Event: 63, Age 15+

Around Mill Lane

10am–5pm

Through the eyes of scientists

PostDoc Centre, 16 Mill Lane, CB2 1SB

Photographs of scientists usually include white coats, small tubes of fancy blue liquid and puzzled expressions! But is this what they do everyday? This exhibition of photographs gives a fresh perspective of what their working days are like.

Event: 64, Map: 34, Exhibition, All ages

10am–3pm

Translational medicine: from bench to bedside

The Pitt Building, Trumpington Street, CB2 1RP

How do you turn basic scientific research into something useful for patients? How can you learn from Clinical Trial results to improve medical treatments? Join the MPhil Clinical Science Translational Medicine and Therapeutics and MPhil Rare Disease students on a journey from bench to bedside, and back.

Event: 65, Map: 42, Hands-on, Age 12+



NATHAN CRILLY

10am–4pm

Solar powered cars with the Department of Engineering

Hicks and Cormack Rooms, University Centre, Granta Place, Mill Lane, CB2 1RU

Make a model car that harnesses the power of light and turns it into movement. Optimise your design to manage this limited energy source. Join University of Cambridge Engineers for a fun filled hands-on exploration of tomorrow's technology. A limited number of car kits are available: one kit per group and when they're gone, they're gone!

Event: 66, Map: 46, Hands-on, Age 8+



CSF@the Cambridge Corn Exchange

Wheeler Street, CB2 3QB
10am–4pm, Saturday 14 March
11am–4pm, Sunday 15 March
Map: 5, Hands-on, All ages



Babraham Institute molecular explorers

Scientists at the Babraham Institute are trying to answer some tough questions about how our bodies work and how they change as we age. They need your help. Step into the pop-up lab and use light-based technologies such as microscopy and flow cytometry to become a Babraham Institute molecular explorer. Will your research help scientists to understand even more?

Event: 67

Cambridge Science Festival in the classroom: a library

Have you ever wanted access to the Cambridge Science Festival all year round, or take the hands-on activities into your classroom or community group? This new online library of available educational activities gives you all the information you need: Key-Stage and subject-specific information as well as how to borrow these free resources. Find the library at: sciencefestival.cam.ac.uk

Event: 68

Discover DNA

Explore the structure of DNA and how it makes us similar but also unique. Find out how computers and technology help us to understand genomes. Join staff from the EMBL European Bioinformatics Institute and Wellcome Trust Sanger Institute for plenty of hands-on activities, perfect for all ages.

Event: 69

The science of eating

Join scientists from the University of Cambridge Metabolic Research Laboratories in activities and games to help explain why we eat what we do and how we use the energy it provides. See if you can identify which is the right diet for you.

Event: 70

Fat, fitness and metabolism

Help the NIHR/Wellcome Trust Clinical Research Facility find out more about diabetes and obesity.

Discover nutrition science

Experience hands-on nutrition science activities at the MRC Human Nutrition Research Unit. Also, try out a free smartphone app, which aims to help people to make healthier food choices.

Event: 71



NELEDECKMAN CIMR
NICOLA LAWRENCE GURDON INSTITUTE

In sickness and in health: cells in the spotlight

Join our researchers from the Cambridge Institute for Medical Research to learn about the wondrous ways of cells and what goes wrong in disease and infection. See how microscopes and movies allow us to watch cells in action, learn about a cell's own transport system and look inside serial killer T-cells that protect us against infection.

Event: 72

Hands-on biology

Can you identify biological specimens, smells and creepy crawlies? Do you know which products come from which plants? Have you tried mirror tracing? Would you like to find out what an owl had for dinner? Some of the great things on offer from Hills Road Sixth Form College students.

Event: 73

Living and breathing with Papworth Hospital NHS Foundation Trust

Papworth Hospital is the largest specialist heart and lung hospital in the country. The hospital will be providing hands-on demonstrations on how to keep your heart and lungs healthy.

Event: 74



Stem cell discoveries

Find out about the amazing world of stem cells. Watch short stem cell films, take part in hands-on stem cell-themed activities, and talk to researchers working in the field about the latest advances. Adults can also win a tour of the Stem Cell Institute, led by one of our top researchers. Further information at: www.stemcells.cam.ac.uk/public-engagement/sciencefestival2015

Event: 75

See your cells

Use microscopes to see your own cells and wonder at the hidden beauty of plants and insects with the help of the MRC Laboratory of Molecular Biology's Microscopes4Schools team. Test your detective skills with our stereomicroscope challenge.

Event: 76

Illuminating statistics

Learn how the MRC Biostatistics Unit collects medical data and analyses it using statistics to improve public health. Test your reaction time, see how random you are, how good you are at learning the weight of sweets and whether you can count ducks. See statistics shine a light on numbers.

Event: 77

The wonderful world of blood vessels

If the blood vessels in our body were laid end to end they would measure ~60,000 miles or 2.5 times around the Earth! Find out from scientists at the Division of Cardiovascular Medicine how fascinating our blood vessels are. See how blood vessels change throughout the animal kingdom, allowing large and small animals to survive, and discover how things go wrong and what we can do to fix them.

Event: 78

SATURDAY ONLY (10am–2pm)

Bottle your genes

Students from Long Road Sixth Form College and the Faculty of Education will help you isolate your own DNA for you to see and take home.

Event: 79

SATURDAY ONLY

Shedding light on bioprocessing

Join MedImmune scientists and conduct model experiments to show how we obtain our biologic medicines (antibodies and other therapeutic proteins) from the cells that make them. Run tests to find out how much biologics have been made and how good they are.

Event: 80

SATURDAY ONLY

Rising Stars

Our Rising Stars training course gives researchers at the University of Cambridge the skills to develop exciting interactive activities. Join our stars of the future as they introduce you to their research.

Event: 81

SATURDAY EVENING AND SUNDAY

Lighting the way to new drug therapy

Join AstraZeneca's scientists and learn how we use light-based technologies to identify, develop and test the activity of our new medicines. Once an active drug is selected see how we use light to follow it as it travels through our body.

Event: 82



ALICE BOGGEY

SATURDAY ONLY

6pm–8pm

CSF@Cambridge Corn Exchange: adults only!

Ever wanted to have a go at all the marvellous hands-on activities at the Science Festival but felt bad about jumping in front of a child? Now's your chance! For two hours, CSF@Cambridge Corn Exchange is open to adults only. Buy a drink and get investigating!

Event: 83, Hands-on, Adults only, Pre-book*



CSF@the Guildhall



Anglia Ruskin
University

Market Square, CB2 3QJ

10am–4pm, Saturday 14 March

11am–4pm, Sunday 15 March

Map: 40, Hands-on, All ages (unless otherwise stated)

Anglia Ruskin University presents

The eyes have it

Discover the amazing tricks your brain plays with the eyes by journeying through a gallery of optical illusions. Play with computerised equipment used to examine the eye and discover how good your 3D vision and colour perception is.

Event: 84

How stable are you?

How well can you balance? We'll put you through a range of unstable situations to see what your balancing skills are really like.

Event: 85, Age 8+

Infection control

How clean are your hands? Find out how bugs and germs can spread, and put your hand washing techniques to the test using our UV hand gel and lights. You'll never skip the soap again!

Event: 86

Jumping for joy

We know that impulses generated when you jump increase jump height and makes you stay in the air for longer. We'll show you how to maximise this and turn yourself into a human pogo stick.

Event: 87, Age 8+

Light up your blood

See how infrared light can measure the amount of oxygen and carbon dioxide in your blood. Find out how these change with different exercise levels.

Event: 88, Age 8+

Light up our house

How much energy does it take to light our homes? What effect is this having on the planet? Could we light our homes differently? Take part in our challenge to generate the energy needed to light a house.

Event: 89

Light on your feet

How agile are you? Have a go at our test, designed to assess agility in basketball players.

Event: 90, Age 8+

The multiple faces of the brain

Test how your brain works with our psychological illusions and investigate the relationship between your body and your brain.

Event: 91

Seeing the world in a different light

Learn how we use light technology to diagnose pain, injury and emotional states in people and animals.

Event: 92

Solve the crime

Get your hands dirty trying forensic techniques like finger printing and anthropology and find out what solving crimes and historical mysteries involves.

Event: 93

The genetics of the black squirrel

Black squirrels are common in parts of Britain. Learn about their genetics and make a model of the protein molecule responsible for their fur colour.

Event: 94

Institute of Engineering and Technology

Hands-on activities demonstrating the impact of everyday activity.

Event: 95

SATURDAY ONLY

1.30pm–2.15pm, 2.45–3.30pm

You decide

Stories of right, wrong, and which road to take in the forest. In the Guildhall Council Chamber you get to be the judge and the jury! Get involved in this storytelling session with Marion Leeper, based on some of the oldest dilemmas of all time.

Event: 96, Performance, All ages, Pre-book*



CHRIS LOADERS

10am–4pm Saturday 14, 11am–4pm Sunday 15 March
Journey to Mars and beyond

Guildhall, Market Square CB2 3QJ

Airbus Defence and Space will be exhibiting a working Mars rover prototype called Bruno. It will move around over rocks on a simulated Martian surface – with members of the ExoMars rover team on hand to explain the programme. ExoMars is the European Space Agency's (ESA) flagship mission to the red planet due to launch in 2018. The entire Mars rover will be manufactured and integrated in Stevenage UK. Also on display will be a model of the Gaia spacecraft observatory. Gaia is an ESA mission launched in December 2013 and is currently cataloguing a billion stars to create a 3D map of the Milky Way. A model of the ESA mission Solar Orbiter will also be on show. Solar Orbiter is being built in Stevenage and is due to be launched in 2017 to study the Sun from an orbit nearer than that of the planet Mercury.

Event: 97, Map: 40, Hands-on, All ages



AIRBUS DEFENCE AND SPACE

CSF@the Department of Chemistry

Lensfield Road, CB2 1EW

Map: 15, Age 8+

Supported by the Walters Kundert Charitable Trust

A map and full list of activities is available from the Chemistry Open Day website: openday.ch.cam.ac.uk or at the welcome desk outside the BMS Lecture Theatre.

10am–4.30pm

Chemistry in action

Visit the Department of Chemistry and try some hands-on chemistry experiments. Once kitted-out in lab coat and safety goggles you are ready to go! This year you can join the Royal Society of Chemistry to investigate the exciting properties of light. Or learn about weather, climate and air pollution with the Centre for Atmospheric Science and British Antarctic Survey. They will help explain how the ozone layer works to protect us from harmful UV radiation and how scientists in Antarctica can help us understand Earth's climate. You can also experiment with their state-of-the-art atmospheric sensors or test your knowledge in the atmospheric quiz.

Event: 98, Hands-on

11am–12noon, 1.30pm–2.30pm, 4pm–5pm
 Additional shows 2pm–3pm, Sunday 15 March
 7pm–8pm, Monday 16 March

The chemistry of light: a demonstration lecture by Dr Peter Wothers

BMS Lecture Theatre

To celebrate the International Year of Light, Dr Peter Wothers' action-packed demonstration lecture explores the elements involved over the centuries in mankind's quest to light the way.

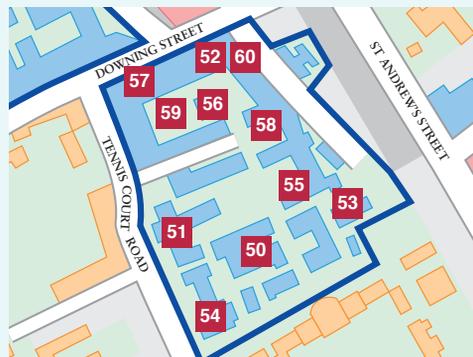
Event: 99, Talk, Pre-book tel: 01223 336300, Monday to Friday 9am–5pm, email: openday@ch.cam.ac.uk. Ticket requests made after 4.30pm on Friday 13 March will not be processed. Uncollected tickets will be available on a first come, first served basis 10 minutes before the lecture begins.

NATHAN PITT



CSF@the Downing Site

Downing Street, CB2 3EQ



For access key see page 50

- | | |
|---|--------------|
| 50 Anatomy Lecture Theatre | T, S, Li |
| 51 Department of Biochemistry (Hopkins) | T, S |
| 52 Department of Earth Sciences | T, PA |
| 53 Department of Geography | T, S |
| 54 Department of Pathology | T, S, Li, PA |
| 55 Department of Psychology | S, Li |
| 56 McDonald Institute for Archaeological Research | T, S, PA, I |
| 57 Museum of Archaeology and Anthropology | T, S, Li, I |
| 58 Physiology Building | T, S, Li |
| 59 Plant Sciences Marquee | S |
| 60 Sedgwick Museum of Earth Sciences | T, PA, Li |

10am–3pm

Department of Pathology

The cosmos of your body

Your body hosts millions of microbes and millions of proteins make your body function. Come to the Department of Pathology to see the miniature world that is your body.

Event: 100, Map: 54, Hands-on, All ages

Why snot?

Why do our noses make snot? It's part of our body's defence against viruses and other bugs. Make your own (fake!) snot and find out about our bodies' amazing standing army.

Event: 101, Map: 54, Hands-on, All ages

Meet the women who do science, technology, engineering and maths

Science can only be done by people and many scientists (arguably not enough) are women. Talk to Cambridge AWiSE about careers in STEM.

Event: 102, Map: 54, Talk, All ages

10am–12noon, 2pm–4pm

Seeing and interacting with our world

Practical Classroom, Department of Psychology

Discover how our vision plays tricks on us, what our tastes tell us about ourselves, the intelligence of crows, and much, much more. Research groups at the Department of Psychology showcase their latest research through a series of fun and interactive exhibits and posters.

Event: 103, Map: 55, Hands-on, All ages

10am–12noon, 2pm–4pm

Bird brain nevermore! From canny crows to judicious jays

Practical Classroom, Department of Psychology

Can a rook use tools? Why are jays deceitful? What of the remarkable memories of scrub-jays? Whether you are a bird enthusiast, keen to work with animals or simply interested in the non-human mind, join us to learn more about the intelligence of these feathered apes.

Event: 104, Map: 55, Hands-on, All ages

10am–4pm

Enlightened plants

Plant Science Marquee

Discover the role light plays in the life of plants through hands-on activities and exhibits by researchers from the Department of Plant Sciences, Sainsbury Laboratory, EnAlgae Partnership and NIAB.

Event: 105, Map: 59, Hands-on, All ages

10am–4pm

Splash and squelch

Department of Geography

Do you have a feeling for mud? Have you ever seen a crayfish? Do you know your samphire from your cordgrass? Explore the magic of muddy and watery places and find out why we need them. Make some waves and play the Delta Game. All this and more from the University of Cambridge Conservation Research Institute, Coastal Research Unit and Environmental Systems and Processes Group.

Event: 106, Map: 53, Hands-on, All ages

10.30am–3.30pm**Time Truck****Watson Gallery, Sedgwick Museum of Earth Sciences**

Travel in time with Time Truck! Investigate rocks and minerals, discover dinosaurs and explore earthquakes.

Event: 107, Map: 60, Hands-on, All ages**10.30am–4pm****The science of archaeology****McDonald Institute for Archaeological Research**

If you thought archaeology was just a load of broken pots and old rubbish, think again! Come and discover bones, stones, and prehistoric plants and see how archaeologists answer questions about our ancient world using science.

Event: 108, Map: 56, Hands-on, All ages,**11am–12noon****Looking into how the brain is built****Main Lecture Theatre, Physiology Building, Physiology, Development and Neuroscience**

There are those who say that to fully understand how a machine works, you have to know how it is built. But how to build something as complicated as the brain is a most challenging problem in itself. Professor Bill Harris and Professor Christine Holt show you some steps to build a brain and discuss how new technologies help us investigate the underlying molecular and cellular mechanisms.

Event: 109, Map: 58, Talk, Age 12+**11am–12noon****Perception of colour****Anatomy Lecture Theatre**

Most mammals have limited colour vision, due to their nocturnal ancestry, but colour perception like ours evolved in the primates, perhaps due to fruit eating. Professor John Mollon shows that there are many forms of colour vision and a minority of women are tetrachromatic – able to make discriminations that are impossible for all men and most women.

Event: 110, Map: 50, Talk, Age 15+**11am–3pm****On the right wave length****Hopkins Building, Department of Biochemistry**

Light is one of our favourite research tools. Its remarkable properties allow us to visualise biological structures such as tissues, cells, structures within cells and even things as small as individual molecules! Join the Department of Biochemistry as we explore the power and versatility of light.

Event: 111, Map: 51, Hands-on, All ages**11am–4pm****Life before artificial light****Museum of Archaeology and Anthropology**

Pick up a Time Traveller's Passport and step back in time with the Museum of Archaeology and Anthropology and Cambridge Spanish Centre. Find out what life was like before artificial light, what people made, ate and decorated.

Event: 112, Map: 57, Hands-on, All ages**12noon–3pm****Science café**

Join scientists from the Department of Zoology for a coffee break. Play spin the wheel of science to find out why animals do what they do. Learn more about beetles and birds, their cells and DNA: our scientists will answer your questions and tell you about research going on in Cambridge and beyond!

Event: 113, Map: 58, Drop-in, All ages**2pm–3pm****Printmaking under the southern Sun****Museum of Archaeology and Anthropology**

A demonstration of the traditional art of fine art etching and relief printing by Anne Virgo, Director and Martin King, printer from Australian Print Workshop. Anne and Martin will talk about their extensive projects working with indigenous artists in remote communities across Australia.

Event: 114, Map: 57, Talk, Age 12+**2pm–3pm****Unbelievable lightness of seeing****Anatomy Lecture Theatre**

As visual animals we depend on light. Yet when we see, light is not what we perceive. Rather the brain adroitly infers the complex and intertwined physical causes of our sensations. Dr Andrew Welchman uses illusions and demonstrations that catch our brains in the act of seeing.

Event: 115, Map: 50, Talk, Age 15+**2.30pm–3.30pm****Ageing artists and creativity****Psychology Lecture Theatre**

The common view of ageing is of decline and dysfunction. What's missing is a depiction of abilities which are preserved or enhanced with age. Creativity increases in the late work of some artists, writers and composers, but what are the cognitive and neural underpinnings of this renewal?

Dr Charlotte Lee and Dr Karen Campbell discuss ageing artists and the science behind their art.

Event: 116, Map: 55, Talk, Age 15+

CSF@the New Museums Site

Downing Street, CB2 2EJ

9.45am–4:30pm

CHaOS talks: from the makers of Crash, Bang, Squelch!

Department of Zoology

CHaOS student volunteers are running a series of talks filled with exciting demonstrations. You will find crashes, bangs, and squelches here if our hands-on events are full, or if you want even more CHaOS at the Science Festival. This year some tickets are online.

9.45am–10.15am

Crystals: discover their beauty and how we can use them in biology
with Richard Misfud

10.45am–11.15am

What is the Universe made of?
with Joe Hooton

11.45am–12.15pm

Sending signals and making messages
with Vamsee Bheemireddy

1pm–1.30pm

Vacuum bazookas and custard fireballs
with Dave Ansell of The Naked Scientists

2pm–2.30pm

Galaxies: fun factories of the Universe
with Gourav Khullar

3pm–3.30pm

When plants fight back
with Sonja Dunbar

4pm–4.30pm

Lasers: around the world in 0.1344 seconds
with Jasmine Rivett

For the latest details about each talk, visit: chaossience.org.uk

Event: 117, Map: 18, Talk, Age 8+, Pre-book visit: eventbrite.co.uk/e/chaos-talks-more-from-the-makers-of-crash-bang-squelch-tickets-14409887361



10am–5pm

Crash, Bang, Squelch!

Department of Zoology

Get to grips with exciting, fascinating and just plain weird science that shows you how the world around us works. Enthusiastic students from CHaOS will show you what goes on in our experiments, looking at lots of science that goes 'crash', 'bang' and 'squelch'! Timed tickets will be available online in advance for guaranteed entry, but you can still come along for drop-in entry.

Event: 118, Map: 18, Hands-on, All ages,
Pre-book visit: eventbrite.co.uk/e/crash-bang-squelch-tickets-14409827181



NICMCPHEE

10.15am–11.15am, 2pm–3pm

CHaOS and Robogals: robots at Crash, Bang, Squelch!

Department of Zoology

CHaOS and Robogals Cambridge are running workshops on robotics with lots of hands-on design and programming. Zero experience is required, we'll teach you all the basics and you can start making your own robots do amazing things in no time at all. Some tickets may be available on the door, but pre-book to avoid disappointment.

Event: 119, Map: 18, Workshop, Age 8+,
Pre-book visit: eventbrite.co.uk/e/chaos-and-robogals-robots-at-crash-bang-squelch-tickets-14409907421

10am–4pm, sessions every 15 minutes
(last session starts at 3pm)

The quest for the curator's code

Whipple Museum of the History of Science,
Free School Lane, CB2 3RH

In this exciting activity use all of your scientific thinking skills to solve a series of fiendish puzzles hidden within the depths of the Whipple Museum. You will need to decrypt messages, break into safes, and navigate treacherous booby traps if you want to solve the mystery behind the curator's code.

Event: 120, Map: 49, Hands-on, Age 8+,
Pre-book*

CSF in the city

9.30am–10.45am, 11am–12.15pm,
1pm–2.15pm, 2.30pm–3.45pm
Spacecraft and solar panels

St Columba's Hall, Downing Street, CB2 3EL

Join STEM Team East to explore the science of spacecraft. Learn about orbits, find out about light-minutes and how the lander Philae fared on Comet 67P without light to charge its batteries from the solar panels. All ages – make a model lander for young people 8 years and over.

Event: 121, Map: 37, Hands-on, Talk, Age 8+, Pre-book*

10am–4pm
**Betwixt Truth and Truth:
debating science and religion
at Christ's College**

**Old Library, Christ's College, St Andrew's Street,
CB2 3BU**

The debate between science and religion is one of the most fascinating and enduring themes of the modern world. In a new exhibition in the stunning period setting of Christ's College Old Library, the crucial contribution Christ's College members, and others, have made to this ongoing debate is explored via the College's rich and diverse collections of printed books, manuscripts and photographs.

Event: 122, Map: 11, Exhibition, All ages



10am–4pm
**Science buskers: light up
your knowledge**
Grafton Centre, CB1 1DB

Light up your knowledge of cells by making your own cell model with volunteers from the British Science Association Cambridgeshire branch. Use a huge, interactive cell model and an exhibition of microscopy photographs for inspiration!

Event: 123, Map: 22, Hands-on, All ages

10.30am–12noon
Lighting up the ancient world
**Museum of Classical Archaeology,
Sidgwick Avenue, CB3 9DA**

Get your hands on 2000-year-old lamps to learn about how the Romans used to light up their homes and have a go making your own oil lamps out of clay to take home with you.

**Event: 124, Map: 33, Hands-on, Ages 7-11,
Pre-book tel: (01223) 330402, email:
museum-education@classics.cam.ac.uk or visit:
lightingupancientworld.eventbrite.co.uk**



BRITISH ANTARCTIC SURVEY

10.30am–3.30pm
**Look in to the Polar light:
family day**

**Scott Polar Research Institute, The Polar
Museum, Lensfield Road, CB2 1ER**

Brought to you by the British Antarctic Survey and the Polar Museum. How do the Northern Lights work? Why do birds migrate with the light? And how do plants in the ocean store up a greenhouse gas? The Zoology Museum will be popping up at the Polar Museum too. Get your hands on real animal specimens from the Zoology Museum and find out what changes we see in polar region animals as the light changes with the seasons.

Event: 125, Map: 43, Hands-on, All ages

10.30am–4pm
**When universes collide:
Buddhism encounters science**

**Cambridge Buddhist Centre,
38 Newmarket Road, CB5 8DT**

Join us for an open day at the Cambridge Buddhist Centre and sample meditation, find out more about about Buddhism and tour the historic Festival theatre. A talk, When Universes Collide, will be given at 12noon by Ratnaprabha (Robin Cooper) which explores the relationship between Buddhism and science in the modern westernised world.

Event: 126, Map: 4, Talk, Tour, Age 15+



10.30am–12.30pm, 2.30pm–4.30pm

Leading lights**Meet outside the Tourist Information Centre, Peas Hill, Cambridge CB2 3AD**

Join Cambridge Science Guides on a walking tour to find out about our leading lights. Learn about revolutionary reflections on the nature of light from Newton to stargazers Eddington and Bell-Burnell. Find out where scientists observed the behaviour of light and identified the structure of matter. Accompanied children and wheelchair users are welcome.

Event: 127, Map: 45, Tour, All ages, Pre-book*

CAMBRIDGE UNIVERSITY LIBRARY

11am–12.30pm

Seeing further than others: Isaac Newton's world of light and colour**Milstein Seminar Rooms, Cambridge University Library, West Road, CB3 9DR**

Professor Rob Iliffe, Director of the Isaac Newton Papers Project in the University of Sussex, talks about Newton's work on light and his great publication, *Opticks*. The talk will be accompanied by a display of Newton's manuscripts from the University Library's treasured collections.

Event: 128, Map: 9, Talk, Age 15+

11am–4pm

Medicines under the microscope**Department of Pharmacology, Tennis Court Road, CB2 1PD**

Join the Department of Pharmacology to fish for daphnia (small aquatic insects) and use a microscope to see their heart, guts, eye and eggs. Perform experiments with caffeine, alcohol, nicotine and cold medicines and see the effect of these common drugs on daphnia heart-rate.

Event: 129, Map: 17, Hands-on, All ages

12noon–1pm

Ideas and languages: six more languages that changed the world**Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW**

Languages shape human culture and human thought. Some languages have shaped our world more than others, some of them not as obvious as you might think. Professor Ian Roberts continues his tour of some of those languages.

Event: 130, Map: 27, Talk, Age 8+, Pre-book*

1pm–2pm

Sci Cam: the science magazine show**Cambridge Union Society, Bridge Street, CB2 1UB**

Join the researchers who host the online general science show Sci Cam for a recording of their show. Each show includes a range of features, from translations of recent scientific research into plain English and interviews with current researchers to Beginners' Guides to scientific topics you may have seen on the news but never quite understood.

Event: 131, Map: 8, Talk, Age 12+, Pre-book*

1pm–4pm

One body: a multitude of cells**Gurdon Institute, The Henry Wellcome Building, Tennis Court Road, CB2 1QN**

The human body is made of trillions of cells. Explore how one cell, the egg, can give rise to so many different cells organised in such an amazingly precise pattern. Come along and watch the first division of a frog egg, see your own cheek cells, examine fluorescent worms, discover the lifestyle of the fly and meet the scientists of the Gurdon Institute.

Event: 132, Map: 24, Hands-on, Age 8+

1.15pm–2pm

The language of light!**Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW**

Come and find out why words that have to do with light are special in English and other languages! In this interactive session, we will explore what makes words like glitter and blink different from chair and table. Find out how these words get their meaning, why glow and gleam all refer to light in English but not other languages, and what this has to do with the way your dog barks.

Event: 133, Map: 27, Workshop, Age 8+, Pre-book*

2pm–4pm, Saturday 14 March
2pm–4pm, Sunday 15 March
Conservation conversations
The Fitzwilliam Museum, Trumpington Street,
CB2 1RB

Pull up a chair and meet an object! Items from across the University of Cambridge Museums will be visiting The Fitzwilliam, along with the people who investigate them. Find out the part that light has played in their stories and how it helps with their conservation.

Event: 134, Map: 39, Hands-on, All ages,

3pm–4pm
Helen Arney: in her element
Cambridge Union Society, Bridge Street, CB2 1UA

The UK's premiere geek songstress is back! The musical third of Festival of the Spoken Nerd has been working with Cambridge scientists to create collaborative songs about their work. Using her Voice of an Angle and trusty ukulele she'll be *In Her Element* performing these new songs, together with the scientists who inspired them. With spoken word from FameLab finalist Robin Lamboll.

Event: 135, Map: 8, Performance, Age 12+, Pre-book*

4pm–5pm
Debating science and religion
The Yusuf Hamied Theatre, Christ's College,
St Andrew's Street, CB2 3BU

A talk with Professor Jim Secord, Head of the Department of History and Philosophy of Science on the debate between science and religion, one of the most fascinating and enduring themes of the modern world.

Event: 136, Map: 11, Talk, Age 12+

10am–4pm, Saturday 14, Sunday 15,
Saturday 21, Sunday 22 March
The role of a modern zoo
Shepreth Wildlife Park, Station Road,
Shepreth, SG8 6PZ

A chance to be enlightened about the conservation needs and work undertaken by small wildlife parks and how this ties in with wider global conservation issues. Presentations at 11.30am (Age 15+) and 3pm (All ages).

Event: 139, Map: online, Hands-on, All ages, Admission charges apply



TANGRAM THEATRE COMPANY

7.30pm–9pm
**Tangram Theatre Company:
The origin of species**

Cambridge Junction, Clifton Way, CB1 7GX
The Origin of Species by means of natural selection or the survival of (t)evolutionary theories in the face of scientific ecclesiastical objections: being a musical comedy about Charles Darwin (1809-1882) tells the incredible story of how Charles Darwin came to discover the secrets of evolution and why it took him over twenty years before he plucked up the courage to publish his remarkable idea. A show packed with big ideas, terrible puns and six cracking original songs from blasted boring barnacles to the perils of marrying your cousin.

Event: 137, Map: 6, Performance, Age 8+, Pre-book tel: 01223 511511, email: tickets@junction.co.uk, or visit: junction.co.uk, £12, £8 concessions

8pm–10pm
**Festival of the Spoken Nerd:
talk nerdy to me**

Cambridge Union Society, Bridge Street, CB2 1UA
The science-comedy phenomenon returns to Cambridge with a new chat show: *Talk Nerdy To Me!* Join stand-up mathematician Matt Parker, experiments maestro Steve Mould and geek songstress Helen Arney as they subject Science Festival stars to questions, experiments and possibly a peer-reviewed karaoke singalong. Don't miss this chance to see another side of science in this raucous, freewheeling show.

Event: 138, Map: 8, Performance, Adults, Pre-book tel: 01223 357851 or visit: cornex.co.uk, £8, £6 concessions



Science on Sunday

Sunday 15 March

We have more great events throughout Cambridge today with Top Talks at Lady Mitchell Hall on the Sidgwick Site and hands-on activities in the Cambridge Corn Exchange and, for the first time, in the Guildhall too! Further afield, catch up with the Naked Scientists at Madingley Hall.

Tune into BBC Radio Cambridgeshire between 6am and 9am for a Sunday morning special show on faith and light with Pam Mungroo.

Highlights

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Top talks at Lady Mitchell Hall

From pterosaurs, molluscs and surviving on Everest to the world of really long molecules

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The quest for the curator's code

Use your scientific skills to solve fiendish puzzles hidden in the Whipple Museum

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Science Sunday

Go science crazy at the Cambridge Science Centre

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CSF@the Cambridge Corn Exchange and **CSF@the Guildhall**

Open for another day of exciting hands-on activities



Top talks@Lady Mitchell Hall

Lady Mitchell Hall, Sidgwick Avenue, CB3 9DA
Map: 28, Talk, Age 8+, Pre-book*

11am–12noon

Dragons of the lost world

The dinosaurs may have ruled the Earth 100 million years ago, but above their heads the pterosaurs ruled the skies. Join zoologist and writer Dr Matt Wilkinson on a journey into the distant past to meet these extraordinary flying reptiles, find out where they came from, how they became the largest flying animals of all time, and why they disappeared.

Event: 140

12.45pm–1.45pm

The weird and wonderful world of really really long molecules

Polymers are amazing molecules that are used in loads of clever ways. Steve Mould reveals the strange workings of well known polymers such as polystyrene and weird ones you've never heard of, like the high tech molecules that are shaping the modern world. A show full of interactive demos and experiments.

Event: 141

2.15pm–3pm

Spirals in time: 200,000 reasons why molluscs are marvellous

From shell-stealing octopuses to snails that suck sharks' blood, molluscs are a weird bunch. Join marine biologist Dr Helen Scales to find out how hermit crabs like to party and butterflies learnt to swim. This interactive talk dives into the spiralling world of seashells and the bizarre animals that make them.

Event: 142

3.45pm–4.45pm

Everest Lab

What happens to your body when you push it somewhere it's not built to go, say to the top of the world? With summit kit, interactive experiments and stunning videos from their trek to the highest lab in the world at Everest Base Camp, join Greg Foot and Nick Insley to find out.

Event: 143

Around the city

10am–4pm, sessions every 15 minutes
(last session starts at 3pm)

The quest for the curator's code

Whipple Museum of the History of Science,
Free School Lane, CB2 3RH

In this exciting activity use all of your scientific thinking skills to solve a series of fiendish puzzles hidden within the depths of the Whipple Museum. You will need to decrypt messages, break into safes, and navigate treacherous booby traps if you want to solve the mystery behind the curator's code.

Event: 144, Map: 49, Hands-on, Age 8+,
Pre-book*



CAMBRIDGE SCIENCE CENTRE

10am–5pm Science Sunday

Cambridge Science Centre, Jesus Lane, CB5 8BQ

The Cambridge Science Centre goes all out science crazy for the Cambridge Science Festival, with a fun-filled day of non-stop hands-on workshops for all the family including slime making! Join us to make and take away some amazing bits of science and engineering.

Event: 145, Map: 7, Hands-on, All ages,
Normal admission charges apply

11am–1pm Children Maths SciScreen

Arts Picturehouse Cambridge,
St Andrew's Street, CB2 3AR

In association with Arts Picturehouse Cambridge and the British Science Association Cambridgeshire branch, Dr James Grime explores the amazing applications of mathematics using a selection of engaging film shorts for children.

Event: 146, Map: 2, Film, Age 8+,
Pre-book visit: picturehouses.co.uk/cinema/Arts_Picturehouse_Cambridge/

11am–4pm
CSF@the Guildhall

Market Square, CB2 3QJ

CSF@the Guildhall opens on Sunday for the first time in 2015 giving us all the opportunity to explore again events from Anglia Ruskin University and Airbus Defence and Space.

Event: 147, Map: 40, Hands-on, All ages

11am–4pm
CSF@the Cambridge Corn Exchange

Cambridge Corn Exchange, Wheeler Street, CB2 3QB

Join CSF@the Cambridge Corn Exchange for another fun packed day of hands-on activities. See Saturday's entry for all the events taking place.

Event: 148, Map: 5, Hands-on, All ages

3pm–4pm
Naked Scientists live

Institute of Continuing Education, Madingley Hall, Madingley, CB23 8AQ

Expand your mind – ask any question on anything scientific, with Dr Chris Smith and the award winning Naked Scientists BBC broadcast science team. Clothes will be kept on, but science will be stripped bare...

Event: 149, Map: online, Talk, Age 12+, Pre-book email: enquiries@ice.cam.ac.uk



INSTITUTE FOR CONTINUING EDUCATION

4.15pm–5.15pm
Shaping the darkness: how light helped build the Universe

Institute of Continuing Education, Madingley Hall, Madingley, CB23 8AQ

Light allows us to decipher the mysteries of the night sky, but it also helped to create them. In this talk with Dr Judith Croston, find out how light is a vital actor in the way stars and galaxies work, and in how they evolved to make up the present-day Universe.

Event: 151, Map: online, Talk, Age 12+, Pre-book email: enquiries@ice.cam.ac.uk

SIR CAM



4.15pm–5.15pm
Springwatch Madingley

Institute of Continuing Education, Madingley Hall, Madingley, CB23 8AQ

Join Dr Ed Turner for a tour of the Madingley Hall grounds to see some of the plants and animals that call Madingley their home. Take a look at some of the signs of spring and investigate the ways that animals and plants respond to longer and warmer days.

Event: 150, Map: online, Tour, All ages, Pre-book email: enquiries@ice.cam.ac.uk



SIR CAM

5.30pm–6.30pm
Festival choral evensong

University Church, Great St Mary's, Senate House Hill, CB2 3PQ

A traditional choral service according to the *Book of Common Prayer* (1662) to celebrate the Science Festival with visiting preacher Professor Russell Cowburn FRS, Department of Physics.

Event: 152, Map: 23, Service, All ages

Throughout the Festival

continued from page 12

10am–12noon, 1pm–2.45pm,
Monday 16 – Friday 20 March
Primary rocket launchpad

Department of Engineering,
Trumpington Street, CB2 1PZ

School groups from Years 5 and 6 are invited to the Department of Engineering to explore 3D geometry by making a rocket launchpad structure. The event finale is launching paper rockets with compressed air. Well made rockets will land on our roof!

Event: 153, Map: 16, Hands-on, Workshop, Ages 9-11, Pre-book tel: 01223 244240, email: melanie@stemteameast.org.uk

10.30am–12.30pm, Monday 16 March
10.30am–12.30pm, Wednesday 18 March
10.30am–12.30pm, Friday 20 March
10.30am–12.30pm, 2.30pm–4.30pm,
Saturday 21 March

Leading lights walking tour

Meet outside the Tourist Information Centre,
Peas Hill, Cambridge CB2 3AD

Join Cambridge Science Guides and learn about revolutionary reflections on the nature of light – from Newton to stargazers Eddington and Bell-Burnell. See where scientists observed the behaviour of light and identified the structure of matter. One 10.30am tour on 21 March will be in Spanish. Accompanied children and wheelchair users are welcome.

Event: 154, Map: 45, Tour, All ages, Pre-book*

1pm–2pm, Monday 16 March
The Cavendish and Victorian Cambridge: founding a laboratory, finding a role

Whipple Museum of the History of Science,
Free School Lane, CB2 3RH

The New Museums Site is one of the University's iconic locations, home to a fascinating variety of scientific work. The Cavendish Laboratory, set up in Free School Lane in the 1870s, became one of the world's leading physics institutions. Its site, staff and aims were controversial; Professor Simon Schaffer links these debates with questions about scientific sites, audiences and functions.

Event: 155, Map: 49, Talk, Age 12+, Pre-book tel: 01223 330906, email: HPS-events@lists.cam.ac.uk

5pm–7pm, Monday 16 March
The roles and responsibilities of universities in relation to planetary sustainability

McGrath Centre, St Catharine's College,
Trumpington Street, CB2 1RL

Dr Bhaskar Vira will chair a panel discussion on the role of universities' investment and research portfolios in relation to activities harmful to climate change.

Event: 156, Map: 36, Talk, Adults, Pre-book*

6pm–7.30pm, Monday 16 March
Plato, light and knowledge

Room 1.02, Museum of Classical Archaeology,
Sidgwick Avenue, CB3 9DA

Vision, says Plato, is much the most informative of all the senses, and is therefore, of all the senses, the one that is most akin to knowledge, understanding and science. Dr Nicholas Denyer discusses light in Plato, followed by a wine reception in the Cast Gallery.

Event: 157, Map: 33, Talk, Adults, Pre-book tel: 01223 330402, email: museum-education@classics.cam.ac.uk or visit: platolightknowledge.eventbrite.co.uk

6pm–7pm, Monday 16 March
Stamping through mathematics

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

Supported by Cambridge University Press

Professor Robin Wilson presents the entire history of mathematics illustrated by around 300 postage stamps featuring mathematics and mathematicians from across the world. From Euclid to Euler, Pythagoras to Poincaré, from Fibonacci to the Fields Medals, all are featured. No particular knowledge of mathematics or philately required.

Event: 158, Map: 30, Talk, Age 12+, Pre-book*

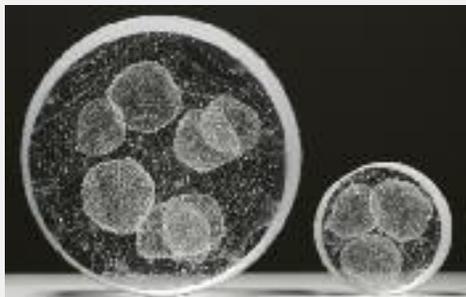
6.30pm–7.30pm, Monday 16 March
Using embryonic stem cells to understand early development

Murray Edwards College, Huntingdon Road,
CB3 0DF

Embryonic stem cells derived from early mouse embryos can turn into any bodily tissue. They can be cultured and placed in a host embryo to make a chimaera. This technology is used to investigate how ES cells differentiate into specific lineages. It also provides surprising insights, as Dr Jenny Nichols shows, into how the embryo responds and regulates its development to accommodate these cells.

Event: 159, Map: 32, Talk, Adults, Pre-book visit: jenny-nichols-talk.eventbrite.co.uk

SYLVAIN DELEU



6.30pm–8.30pm, Monday 16 – Tuesday 17 March,
Thursday 19 – Friday 20 March
2pm–6pm, Saturday 21 March
LENS

Solar Physics building, Institute of Astronomy,
Madingley Road, CB3 0HA

A joint exhibition by the glass artist Livvy Fink and the poet Ezra Rubenstein which draws on the connections between oncology and astronomy. Discover unfamiliar worlds inspired by the most distant galaxies and the cells within us, frozen moments occurring somewhere between liquid and solid states, where light is diffused through a myriad of intricate surfaces, suspended within glass.

Event: 160, Map: 66, Exhibition, Age 12+

6.30pm–9pm, Monday 16 March
SciScreen: Jurassic Park

Arts Picturehouse, St Andrews Street, CB2 3AR

In association with Arts Picturehouse Cambridge, the British Science Association Cambridgeshire branch has invited Dr Matthew Wilkinson, specialist in pterodactyl flight, to discuss dinosaur locomotion and the science in the film classic Jurassic Park.

Event: 161, Map: 2, Film, Age 12+, Pre-book visit:
www.picturehouses.co.uk/cinema/Arts_Picturehouse_Cambridge/,
Normal admission charges apply

7pm–8pm, Monday 16 March
**Shining light through rocks:
magma down the microscope**

Department of Earth Sciences, Downing Street,
CB2 3EQ

What makes volcanoes erupt? What controls how explosive and dangerous those eruptions are? Professor Marian Holness investigates these questions and explores the physical properties of molten rock (or magma). She shows how microscopes using polarised light allow geologists to determine the composition of the rock and help us understand the behaviour of volcanoes.

Event: 162, Map: 52, Talk, Adults, Pre-book*

7.30pm–9pm, Monday 16 March
**CSAR new books evening:
meet the authors**

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

The Cambridge Society for the Application of Research new books evening showcases new publications. Speakers will give a short talk on their latest title. This will be followed by questions and a reception with the authors.

Event: 163, Map: 30, Age 12+, Talk,
Pre-book email: csarscr@hermes.cam.ac.uk,
£3 suggested donation

7.30pm–9.30pm, Monday 16 March
This Room

Howard Theatre, Downing College,
Regent Street, CB2 1DQ

Supported by the Wellcome Trust

This Room, a new performance by Laura Jane Dean draws on personal experience of living with OCD and reveals the actualities and artefacts of a therapeutic process. In collaboration with Professor Trevor Robbins, Director of the Behavioural and Clinical Neuroscience Institute, and a Cognitive Behavioural Therapist, Laura attempts to understand what it means to be ill and what it might mean to get better.

Event: 164, Map: 20, Performance,
Age 15+, Pre-book*



COLIN HUMPHREYS

8pm–9pm, Monday 16 March
**Out of the red and into the blue:
making the LED revolution
cost-effective**

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

Gallium nitride is probably the most important semiconductor material since silicon. It emits brilliant light as well as being a key material for next-generation transistors. From efficient lighting and water purification to biomedicine and power electronics, Professor Sir Colin Humphreys introduces us to his research into this remarkable material.

Event: 165, Map: 30, Talk, Age 12+, Pre-book*

1.15pm–2pm, Tuesday 17 March
**Of science and art: the Grand Heures
 of Philip the Bold**

The Fitzwilliam Museum, Trumpington Street,
 CB2 1RB

Grandes Heures, one of the most richly illuminated and complex manuscripts in the library of the Burgundian Dukes, was produced in two major campaigns. The original, initiated by Philip the Bold in 1376, is the focus of this talk by Dr Paola Ricciardi who will discuss how analysis of the materials and illumination techniques helped establish the involvement of its two renowned artists in this extraordinary manuscript.

Event: 166, Map: 39, Talk, Adults, Entrance token available from the Courtyard foyer from 12.45pm

4.30pm–9.30pm, Tuesday 17 March
Museum Escape: the polar domes
 Scott Polar Research Institute, The Polar Museum,
 Lensfield Road, CB2 1ER

Your mission should you choose to accept it, is to escape the museum... The Polar Museum brings you *Museum Escape*, an interactive live escape game designed for groups of 3 to 8 people. Find hints and clues, solve puzzles, and crack codes as you race against time in order to escape from a room you are locked in. The Polar Museum will be open to the public to browse from 5pm–8.30pm.

Event: 167, Map: 43, Hands-on, Adults, Pre-book email: museumevents@spri.cam.ac.uk or visit: spri.cam.ac.uk/museum/events, £30 per team of up to 8 players

6pm–7.30pm, Tuesday 17 March
Carrying the hopes of millions...

Judge Business School, Trumpington Street,
 CB2 1AG

This year the UN will implement the Sustainable Development Goals, which will determine the direction of the global agenda on international development for the next 15 years. What are they and what do they actually mean? Dr Bhaskar Vira and a panel of experts drill down in to the detail of these Goals, and the role that biodiversity and natural capital will play in their delivery.

Event: 168, Map: 26, Talk, Age 15+, Pre-book*



6pm–7.30pm, Tuesday 17 March
**Dementia research in Cambridge:
 from bench to bedside**

Biochemistry Lecture Theatre, Sanger Building,
 Tennis Court Road, CB2 1GA

Sponsored by Alzheimer's Research UK

Dementia affects over 8,000 people in Cambridgeshire, but the region is also home to some of the world's leading dementia researchers. Hear short talks from researchers using different techniques from stem cells to brain scans to understand what happens in the brain in dementia and find out what progress is being made to help.

Event: 169, Map: 14, Talk, Age 15+, Pre-book*



UNIVERSITY OF CAMBRIDGE

6pm–8pm, Tuesday 17 March
How to grow orchids

Botanic Garden, Brookside, CB2 1JE

If you have an orchid languishing on a windowsill and need advice on how to look after it join Alex Summers, Head of the Botanic Garden's Glasshouse Range, for this practical session behind the scenes at the Botanic Garden's Orchid Festival.

Event: 170, Map: 3, Workshop, Adults, Pre-book tel: 01223 331875, email: education@botanic.cam.ac.uk or visit: botanic.cam.ac.uk

6.30pm–7.30pm, Tuesday 17 March
**Too much information: how stem
 cells cope with information overload**
 Murray Edwards College, Huntingdon Road,
 CB3 0DF

Embryonic stem cells can either make more copies of themselves or differentiate to form any cell type in the body. How cells make the decision to differentiate, and which cell type to differentiate into, is controlled by which genes they turn on, and which they turn off. Dr Brian Hendrich's lab studies how precise control of gene expression allows cells to make these decisions.

Event: 171, Map: 32, Talk, Adults, Pre-book or visit: brian-hendrich-talk.eventbrite.co.uk

7pm–8pm, Tuesday 17 March
Giant tsunamis: the Mediterranean: what lifted Rhodes and Crete out of the sea?

Tilley Lecture Theatre, Department of Earth Sciences, Downing Street, CB2 3EQ

The ancient Mediterranean world experienced several catastrophic tsunamis, the most famous destroying Alexandria and the Nile delta in AD 365 and 1303. Using clues left on islands and beaches, Professor James Jackson investigates the possible causes and impacts of ancient tsunamis. This detective work could help us understand the implications of these events on the modern world.

Event: 172, Map: 52, Talk, Adults, Pre-book*

7.30pm–9.30pm, Tuesday 17 March
Sustainable food in the spotlight

Aldren Wright Room, Friends' Meeting House, Jesus Lane, CB5 8AB

Can you lower your carbon footprint by changing what food you eat? Join Cambridge Carbon Footprint and consider the factors which determine the impact of our food on the environment.

Event: 173, Map: 21, Workshop, Age 15+,
 Pre book tel: 01223 301842, or email:
info@cambridgecarbonfootprint.org

7.30pm–8.30pm, Tuesday 17 March
Illuminating life at the single cell level

Auditorium, Sainsbury Laboratory, 47 Bateman Street, CB2 1LR

Advances in microscopy reveal a rich variety in cell behaviour even in genetically identical cells in identical environments. Dr James Locke explores this new research which could affect our understanding of antibiotic resistance, cancer and plant development.

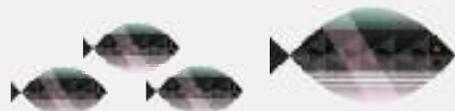
Event: 174, Map: 35, Talk, Age 15+, Pre-book*

7.30pm–9pm, Tuesday 17 March
Preventing the rise of antibiotic resistance?

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

Antibiotics are estimated to add 20 years to all of our lives. But in the 80 years since the discovery of penicillin, overuse of antibiotics has led to untreatable superbugs. Join Professors Clare Bryant, Andres Floto, Dame Athene Donald, and Dr Mark Holmes as they discuss how to prevent the rise of antibiotic resistance.

Event: 175, Map: 30, Talk, Age 15+, Pre-book*



1pm–2pm, Wednesday 18 March
Cloud chambers: tracking the history of particle physics in Cambridge

Whipple Museum of the History of Science, Free School Lane, CB2 3RH

The New Museums Site is one of the University's iconic locations, home to a fascinating variety of scientific work. Dr Richard Staley explores the social environment of the Cavendish Laboratory from the 1890s to the 1940s and shows how CTR Wilson's cloud chamber helped explore meteorology and opened up research on cosmic rays.

Event: 176, Map: 49, Talk, Age 12+, Pre-book tel:
 01223 330906, email: HPS-events@lists.cam.ac.uk

1pm–3pm, Wednesday 18 March
Life sciences poster exhibition

University Centre, Granta Place, Mill Lane CB2 1RU
 Sponsored by Linguamatics

If you've ever wondered what early-career scientists at the University of Cambridge work on, come along and meet them and see posters about their research.

Event: 177, Map: 46, Exhibition, Ages 15+

1.15pm–2pm, Wednesday 18 March
Brand new old masters

The Fitzwilliam Museum, Trumpington Street, CB2 1RB

A talk by Spike Bucklow, Hamilton Kerr Institute.

Event: 178, Map: 39, Talk, Adults, Entrance by token from the Courtyard foyer from 12.45pm

2pm–6pm, Wednesday 18 March
Machines that reconstruct the world

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

Vision capabilities are indispensable for intelligent machines. Whilst visual understanding, navigation, recognising objects and inferring relationships are trivial tasks for humans, giving a machine these capabilities is a big challenge. Find out how we give machines the ability to capture the 3D world.

Event: 179, Map: 30, Exhibition, All ages

6pm–7pm, Wednesday 18 March
Light and colour: experiments and theory

Pippard Lecture Theatre, Cavendish Laboratory, JJ Thomson Avenue, CB3 0HE

In the 2015 Year of Light, this interactive talk celebrates the great experiments which led to our understanding of the nature of light and colour. Join Professor Malcolm Longair as he repeats many of these great experiments and explains the theory behind them. The lecture will include numerous simulations and animations.

Event: 180, Map: 61, Talk, Age 8+, Pre-book*

6pm–8pm, Wednesday 18 March
Connectivity and flow in future cities

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

Today, more people live in cities than in rural areas and, by 2050, this ratio is predicted to rise to 7 out of every 10 people. Such rapid growth and urbanisation creates tremendous opportunities and also tremendous social and environmental challenges. A panel will discuss sustainable cities and how increased connectivity and the flow of resources, people and energy could help to shape them.

Event: 181, Map: 30, Talk, Age 12+, Pre-book*

6pm–8.30pm, Wednesday 18 March
Exploring mind and brain

MRC Cognition and Brain Sciences Unit,
 15 Chaucer Road, CB2 7EF

An evening exploring our research in psychology and neuroscience through hands-on activities, practical demonstrations and talks.

Event: 182, Map: 31, Hands-on, Talk, Age 12+

6.30pm–7.30pm, Wednesday 18 March
**Blood and leukaemia stem cells:
 the root of all (evil)**

Murray Edwards College, Huntingdon Road,
 CB3 0DF

Dr Brian Huntly's lab studies leukaemia development, in particular acute myeloid leukaemia. They are interested in how normal blood stem cell function is subverted by mutations during leukaemia development and how these mutations alter the expression of genes. Their work aims to improve leukaemia treatment outcomes through the identification of critical molecules and therapies that target them.

Event: 183, Map: 32, Talk, Adults, Pre-book visit:
brian-huntly-talk.eventbrite.co.uk

7pm–8pm, Wednesday 18 March
Light in rocks: in paintings

Tilley Lecture Theatre, Department of Earth
 Sciences, Downing Street, CB2 3EQ

We usually think of rock as definitively solid and impenetrable to light. But light does penetrate rock. In fact, if it didn't, rocks would all look rather boring. Dr Spike Bucklow discusses the wide range of colours offered by rocks that were used by historic artists as ingredients in the creation of great paintings.

Event: 184, Map: 52, Talk, Adults, Pre-book*



7.30pm–8.30pm, Wednesday 18 March
**Sex by numbers:
 statistics of our intimate lives**

Lady Mitchell Hall, Sidgwick Site
 Sidgwick Avenue, CB3 9DA

The latest survey of British sexual behaviour suggests that we are becoming more experimental in our sex lives, but there is less of it going on. Professor David Spiegelhalter will look at sex statistics going back to 1580, show that more boys are born at the end of wars, and argue that this means sexual activity was at a historical minimum in 1898.

Event: 185, Map: 28, Talk, Age 15+, Pre-book*



JMA PHOTOGRAPHY-76 RICHARD DAVENPORT

7.30pm–9pm, Wednesday 18 – Thursday 19 March
Pioneer

Cambridge Junction, Clifton Way, CB1 7GX

Curious Directive return to Cambridge with their multimedia sci-fi thriller, Pioneer, a poignant tale of the first humans on Mars. Millions of kilometres from Earth, a young couple slowly uncover the true nature of their mission. The first night will be followed by a post-show discussion with the scientific collaborator, Dr Lewis Dartnell.

Event: 186, Map: 6, Performance, Age 12+,

Pre-book tel: 01223 511511,

email: tickets@junction.co.uk

or visit: junction.co.uk, £12, £8 concessions

8.15am–10.15am, Thursday 19 March
Solar eclipse viewing

Sackler Lecture Theatre & Observatory Lawns,
 Institute of Astronomy, Madingley Road, CB3 0HA

Come and observe a solar eclipse as it happens!

A partial solar eclipse will be visible from Cambridge, with over 85% of the Sun's surface obscured by the Moon at 9.33am. Live images will be relayed to our lecture theatre with expert commentary – and if it's clear weather we'll also open up the telescopes for safe public viewing of the partial eclipse.

Event: 187, Map: 66, Drop-in, Age 8+

9.30am–10.45am, 11am–12.15pm,
1.15pm–2.30pm, Thursday 19 March
**Science of sport for schools
(ages 8-12)**

Sports Hall, University of Cambridge Sports
Centre, Philippa Fawcett Drive, CB3 0AS

Test your strength, fitness and agility using our fun,
interactive challenges. Have you got quicker reaction
times than your teacher? Activities include BATAK
wall, target practice, vertical jumps and a speed test.

Event: 188, Map: 68, Hands-on, Ages 8-12,
Pre-book tel: 01223 762096,
email: kate.crouch@sport.cam.ac.uk
or visit: sport.cam.ac.uk

1pm–5pm, Thursday 19 – Friday 20 March
10am–5pm, Saturday 21 – Sunday 22 March
Wellcome Image Awards 2015

Cambridge Science Centre, Jesus Lane, CB5 8BQ

Experience a world of extraordinary scientific imagery.
These award winning images created using cutting
edge imaging bring to life the vibrancy of science
normally hidden to the naked eye.

Event: 189, Map: 7, Exhibition, All ages,
Normal admission charges apply

5.30pm–6.30pm, Thursday 19 March
**El Nino: what on earth will
happen next?**

Centre for Mathematical Sciences,
Wilberforce Road, CB3 0WA

El Niño events are the largest causes of year-to-year
climate variability on a global scale, bringing floods to
some regions and droughts to others. Using maths,
Dr Michael Davey explains the phenomenon and
describes how El Niño events occur and evolve.

Event: 190, Map: 62, Talk, Age 15+, Pre-book tel:
01223 766839 or visit: maths.org/events

6pm–7pm, Thursday 19 March
**Jess Thom: laughter as a catalyst
for change**

Palmerston Room, St John's College,
St John's Street, CB2 1TP

Writer, artist and part-time super-hero Jess Thom is
'changing the world one tic at a time'. In this 12th
Annual Disability Lecture, Jess talks about Tourette's,
which causes her to say 'biscuit' up to 16,000 times a
day. She discusses the power of humour and art to
create change, experiences at university and the
importance of the Access to Work and Disabled
Students' Allowances schemes.

Event: 191, Map: 38, Talk, All ages, Pre-book*

6pm–7pm, Thursday 19 March
**Fred Sanger: sequencer and double
Nobel laureate**

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

Supported by Cambridge University Press

Fred Sanger (1918–2013) was one of Cambridge's
most illustrious scientists. Professor George Brownlee
shows how this modest man used his persistence
and imagination to solve two problems in molecular
biology, sequencing proteins and sequencing RNA
and DNA. For this he was awarded two Nobel Prizes;
the only British scientist to achieve this.

Event: 192, Map: 30, Talk, Age 12+, Pre-book*

6pm–7pm, Thursday 19 March
**Synchronised fireflies and balancing
broomsticks: or why bridges wobble!**

Pippard Lecture Theatre, Cavendish Laboratory,
JJ Thomson Avenue, CB3 0HE

Supporting a traffic jam in the sky is easy, things
become trickier when wind blows and if designers
get it wrong the consequences are terrible. Find out
how engineers get it right. Cambridge Physics Centre
presents a public lecture by Dr Allan McRobie. This
lecture is aimed at School Years 12 and 13.

Event: 193, Map: 61, Talk, Age 15+

6pm–7.30pm, Thursday 19 March
Cambridge stars: big ideas 2

Mill Lane Lecture Rooms, 8 Mill Lane, CB2 1RW

Royal Society Fellows are the most eminent scientists
and engineers in the UK and Commonwealth. In
2014, 11 new Fellows were elected from Cambridge.
We welcome David Ron, Professor of Cellular
Pathophysiology; Randy Read, Professor of Protein
Crystallography and Paul Midgley, Professor of
Materials Science to introduce us to their research.

Event: 194, Map: 30, Talk, Age 12+, Pre-book*

6.30pm–7.30pm, Thursday 19 March
Stem cells: unravelling brain disease

Murray Edwards College, Huntingdon Road,
CB3 0DF

Brains are composed equally of grey and white
matter. White matter provides a data superhighway
linking ~100 billion neurons in the grey matter, the
brain's computational area. White matter damage can
cause disability; but, unlike grey matter, it can be
repaired. Dr Thóra Káradóttir explores the brain's
superhighways and how they might be repaired
when diseased.

Event: 195, Map: 32, Talk, Adults, Pre-book visit:
thora-karadottir-talk.eventbrite.co.uk

6.30pm–8.30pm, Thursday 19 March
The science of living playfully

Audit Room, King's College, King's Parade, CB2 1ST

Why is being playful important for adults too? Join Professor Patrick Bateson and creative facilitators Playful Being for this unique interactive event where theory meets practice. Learn about the biology and psychology of playfulness and its links to creativity and innovation, and remind yourself what it feels like to be playful, in a relaxed and informal workshop.

Event: 196, Map: 27, Adults, Workshop,
 Pre-book: playfulbeing@outlook.com

7pm–8pm, Thursday 19 March
Homeopathy: science fact or science fiction?

Department of Chemistry, Lensfield Road, CB2 1EW

Professor Jayne Lawrence describes the history of homeopathy and the controversy that has grown since it began in the 1790s. She explores the scientific and medical evidence proposed by modern homeopaths and whether homeopathic practice has anything to offer modern medicine.

Event: 197, Map: 15, Talk, Age 12+

7.45pm–9pm, Thursday 19 March
Einstein's legacy: 100 years of general relativity

Howard Lecture Theatre, Downing College, Regent Street, CB2 1DQ

Sponsored by Science AAAS

The year 2015 is the 100th anniversary of Albert Einstein's full formulation of the theory of general relativity. This research fundamentally changed our concepts of space and time. We are delighted to welcome Professors John D Barrow and Ulrich Sperhake from the University of Cambridge and Professor Michael Kramer from Max Planck Institute for Radio Astronomy and University of Manchester to discuss Einstein's legacy.

Event: 198, Map: 20, Talk, Age 12+, Pre-book*

8pm–10.30pm, Thursday 19 March
Bright Club

The Portland Arms, Chesterton Road, CB4 3BA

Six of Cambridge's bravest academics, post-docs and PhDs get up behind the microphone to have a go at doing stand-up comedy based on their work. Compèred by our surprise guests.

Event: 199, Map: 44, Performance, Adults,
 Pre-book tel: 07980 155167,
 email: andy@thinkoutreach.org or visit:
cambridge.brightclub.org, £8 pre-book,
 £10 on the door

9.30am–10.45am, 11am–12.15pm,

Friday 20 March

Science of sport for schools (ages 12-16)

Sports Hall, University of Cambridge Sports Centre, Philippa Fawcett Drive, CB3 0AS

Test your strength, fitness and agility using our interactive challenges. Are your reactions quicker than your teacher's? Activities include BATAK wall, target practice, vertical jumps and a speed test.

Event: 200, Map: 68, Hands-on, Ages 12-16,
 Pre-book tel: 01223 762096,
 email: kate.crouch@sport.cam.ac.uk
 or visit: sport.cam.ac.uk

4pm–5pm, Friday 20 March

Alex Hopkins lecture: mercury, window on the invisible

Department of Chemistry, Wolfson Lecture Theatre, Lensfield Road, CB2 1EW

Is mercury the most beautiful and reviled element in the periodic table? The only liquid metallic element at room temperature, its inertness and density make it crucial to science. And its red ore cinnabar has been used in artwork for over 2000 years. Dr Andrea Sella explores mercury and asks can we bring it to life?

Event: 201, Map: 15, Talk, Age 8+, Pre-book tel:
 01223 336339, email: slb61@cam.ac.uk

6pm–7pm, Friday 20 March

Fartology

Department of Chemistry, Lensfield Road, CB2 1EW

Join us on a journey through our digestive system with Stefan Gates and Dr Andrea Sella as they introduce us to the science behind our own chemistry laboratory!

Event: 202, Map: 15, Talk, Age 8+, Pre-book*

6pm–7pm, Friday 20 March

Brain mechanisms of drug addiction: are abstinence and prevention of relapse realistic treatment goals?

William Harvey Lecture Theatre, Clinical School, Cambridge Biomedical Campus, CB2 0SP

Cambridge Neuroscience Public Lecture

Professor Barry Everitt discusses the psychological and neural mechanisms by which some individuals compulsively seek and take drugs. Those addicted find it extremely difficult to abstain and, if they do, have a high propensity to relapse. He discusses experimental studies of addiction that have identified pro-abstinence and relapse prevention treatments.

Event: 203, Map: 71, Talk, Age 15+

Science on Saturday: two

Saturday 21 March

The Centre for Mathematical Sciences, the Institute of Astronomy and Departments on the West Cambridge Site open their doors today. For the first time the new University of Cambridge Sports Centre is open during the Science Festival. Drop in and have a look around at the architecture and facilities and join us as we discover the science behind ice cream.

Car parking is available on the West Cambridge Site and there are plenty of places to leave your bicycle.

With plenty going on in the centre of Cambridge too, stop by the Cambridge Union Society or hear music at West Road Concert Hall.

Highlights

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Maths open day

From the Big Bang to climate change, how mathematics is used every day

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Schools Zone

Exciting demonstrations from our next generation of scientists and engineers

Page 40

Rise to the James Dyson Foundation Challenge

Take part in challenges with engineers from Dyson and the University of Cambridge

Page 44

Robin Ince's reality tunnel

Robin returns to the Cambridge Union to investigate why we believe what we believe

CSF@the Centre for Mathematical Sciences

Wilberforce Road, CB3 0WA
Map: 62 (see p40)

12noon–4pm

Maths public open day

From Isaac Newton to the present day, Cambridge has been associated with some of the most famous mathematicians in history. Modern mathematicians and theoretical physicists work on everything from number theory to the Big Bang; exotic geometries to fluid dynamics; black holes, superstrings and particle physics; statistics in finance, health and league tables; and modelling climate change to investigating the spread of disease. Join students and staff from the Faculty of Mathematics to explore the excitement and scope of this rich, diverse and creative subject, through hands-on activities for all ages from 8 to adult.

Event: 204, Hands-on, Age 8+

12.15pm–1.15pm

Thinking mathematically

Join Charlie Gilderdale to work on some of his favourite mathematical problems from NRICH (nrich.maths.org), and discover that everyone can think mathematically. Come prepared to explore, discuss, conjecture, question, explain and generalise!

Event: 205, Talk, Workshop, Ages 11-13

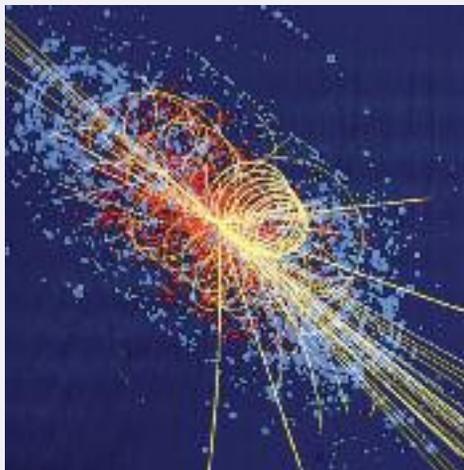
11am–12noon

Longitude found!

Isaac Newton Institute for Mathematical Sciences, 20 Clarkson Road, CB3 0EH

250 years ago, the men of the Board of Longitude sat around a table to discuss how to spend life-changing sums of government money. With tales of challenges, rewards, skull-duggery and sailors lost at sea, Dr Rebekah Higgitt from the University of Kent will tell the story of finding longitude.

**Event: 207, Map: 67, Talk, Age 15+,
Pre-book tel: 01223 335983,
email: s.wilkinson@newton.ac.uk
or visit: eventbrite.co.uk/e/longitude-found-tickets-14525112001**



CERN

2pm–3pm

The Large Hadron Collider and the dark matter mystery

The Large Hadron Collider will start operation again at a higher energy at the beginning of 2015. Join Professor Ben Allanach for an introduction to the machine, particle physics and the discovery of the Higgs boson. Could further experimental testing by the LHC help us understand the mysterious dark matter observed in the universe?

Event: 206, Talk, Age 15+



ISAAC NEWTON INSTITUTE FOR MATHEMATICAL SCIENCES

CSF@West Cambridge

Saturday 21 March



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For access key see page 50

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|--|-------------|---|-------------|
| 61 Cavendish Laboratory | T, S, Li, I | 65 Institute for Manufacturing | T, S, Li, I |
| 62 Centre for Mathematical Sciences | T, S, Li, I | 66 Institute of Astronomy | T, PA |
| 63 Department of Materials Sciences and Metallurgy | T, S, Li, I | 67 Isaac Newton Institute for Mathematical Sciences | T, S, Li, I |
| 64 Hauser Forum | T, S, Li | 68 University of Cambridge Sports Centre | T, S, Li |

10.30am–4.30pm

Drop-in table tennis

University of Cambridge Sports Centre,
Philippa Fawcett Drive, CB3 0AS

The University of Cambridge Sports Centre will be offering free drop-in sports sessions. Try one and then refresh yourself at the cafe afterwards!

Event: 208, Map: 68, Hands-on, Age 8+

11am–3pm

Schools Zone

Hauser Forum, Charles Babbage Road, CB3 0GT
Sponsored by BlueBridge Education

Teams of students from schools and sixth form colleges are the experts today, showing what is happening in schools either as part of their curriculum or in after-school clubs. Don't miss these exciting demonstrations from the next generation of scientists, engineers and mathematicians.

Event: 209, Map: 64, Hands-on, All ages



11.30am–12.30pm, 2pm–3pm

Ten things you didn't know about ice cream

Sports Hall, University of Cambridge Sports Centre, Philippa Fawcett Drive, CB3 0AS

Did you know that ice cream, as well as being the world's coolest dessert, is a fascinating material with amazing properties? In this talk we explore the history of ice cream, the science behind why ice cream tastes so good, and we'll make gallons of ice cream for the audience using the ultra-fast cooling power of liquid nitrogen.

Event: 210, Map: 68, Talk, Age 8+, Pre-book*

12pm–4pm

Rise to the James Dyson Foundation Challenge

University of Cambridge Sports Centre,
Philippa Fawcett Drive, Cambridge, CB3 0AS

Presented with the James Dyson Foundation
Join engineers from Dyson and the Department of Engineering to reconstruct a Dyson vacuum machine head and take part in other short engineering challenges.

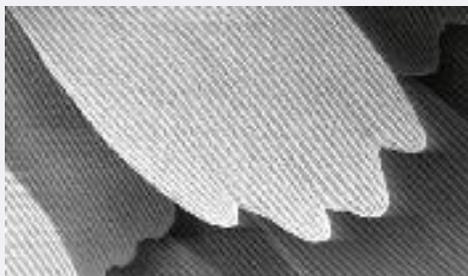
Event: 211, Map: 68, Hands-on, Age 8+

CSF@Materials and Metallurgy

Charles Babbage Road, CB3 0FS

Map: 63

SECRETDISC



10am–3pm

Materials workshops: invisibility, water, food science, light

First Floor

A series of 15-minute materials workshops on the themes of invisibility, water, food science and light. These are ideal for children between 6 and 13 years old to gain hands-on experience of everyday scientific phenomena.

Event: 212, Hands-on, All ages

10.30am–11.30am

See small, see more: electron microscopes

Goldsmiths' 1 Lecture Theatre

For the last fifty years electron microscopy has played an important role in studying materials at the nanoscale. Duncan Johnson and Josh Einsle give a brief history of electron microscopy, from JJ Thompson discovering the electron in 1897 through to modern day experiments which further our understanding of the material world.

Event: 213, Talk, Age 12+

11am–3.30pm

Technology kitchen

Seminar Room

Raspberry pies, Java beans, and Ada fruits: what if we could make technologies that are safe enough to eat? Interested in baking technologies for real? Join the University of Lancaster cooking crew! We will bring a kit jam-packed with bespoke tools and ingredients: do bring your imagination, help us to combine shapes, mix materials, and come up with new recipes. Let's start a technology revolution in the kitchen.

Event: 214, Hands-on, All ages

11.45am–12.45pm

Steel: probably the best material in the world

Goldsmiths' 1 Lecture Theatre

Now taken for granted, steel is probably the most important material ever discovered. It is used to build our machines, vehicles and buildings, it is worshipped in some cultures, and it was the heart of the industrial revolution. This talk explores why steel is such an incredible material and how it will become even more vital to us in the future.

Event: 215, Talk, Age 12+

1pm–2pm

Superconductivity: a ballroom dance of electron pairs

Goldsmiths' 1 Lecture Theatre

Mario Amado-Montero and Angelo Di Bernardo give an overview of superconductivity and its uses in medical resonance imaging, railway transportation, particle detection and in future technology. They also will demonstrate the properties of superconductors when cooled in liquid nitrogen!

Event: 216, Talk, Age 12+

2.15pm–3.15pm

Gallium nitride: lighting the future

Goldsmiths' 1 Lecture Theatre

This talk investigates the fascinating properties of the light-emitting crystal, gallium nitride, which have led to a billion-dollar LED, transistor and laser industry, the potential to dramatically reduce carbon dioxide emissions with energy-saving electronic devices, and the recent announcement of the 2014 Nobel Prize in Physics for the invention of the blue LED.

Event: 217, Talk, Age 12+



CSF@the Cavendish Laboratory

JJ Thompson Avenue, CB3 0HE

1pm–5pm

Map: 61, Hands-on, Talks, All ages (unless otherwise stated)

Hands-on physics

Participate in popular demonstrations of physics. Experience enlightening events and make a science toy to take home. Past Festival favourites will return and see many new scientific surprises.

Event: 218

Experiments, demonstrations and CHaOS

Exciting practical demonstrations of diverse physics, which reveal the beauty and surprise of scientific understanding with its relevance to everyday life.

Event: 219

Astronomy road show planetarium

Sponsored by the East Anglian Branch of the Institute of Physics

Explore the night sky. Learn about space, stars and the solar system in an interactive show.

Event: 220

Light: invisibility and confusion

Can you trust what your eyes see? And how do you cope when you can't? Come and see a working invisibility cloak, amazing vanishing marbles and try your luck at day to day tasks when you can't see anything. With the Optical Society of America.

Event: 221



Physics IS fun talks

Small Lecture Theatre

1.45pm–2.15pm

Physics you meet every day: especially in toys with Dr Lisa Jardine-Wright

Age 12+

2.45pm–3.15pm, 3.15pm–3.45pm

3.45pm–4.15pm, 4.15pm–4.45pm

3 minute wonder competition

Sponsored by the East Anglia Branch of the Institute of Physics

Age 15+

Pippard Lecture Theatre

1pm–1.45pm

Structure and Patterns: how they influence our perception of the world around us

with Dr Mete Atature

Age 12+

2.30pm–3pm

Tripping the light fantastic with Dave Ansell

3.45pm–4.15pm, 4.30pm–5pm

Vacuum bazookas and custard fireballs with Dave Ansell

Event: 222, Age 8+ (unless otherwise stated)

Pre-book visit: tinyurl.com/cavendish-sw

2pm–4pm

isaacphysics.org: try the new online learning tool for A-level Physics

Solve questions based on the Rosetta mission to Comet 67P, explain why a chain being pulled out of a beaker seems to leap out of it, or just revise some A-level topics.

Event: 223, Hands-on, Age 15+

CSF@the Institute of Astronomy

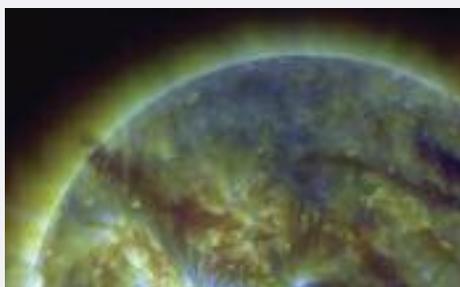
Madingley Road, CB3 0HA

2pm–6pm

Event: 224, Map: 66, Hands-on, Age 8+

Open afternoon

The Institute of Astronomy will have talks, displays, demonstrations and hands-on activities for everyone to learn more about astronomy and the kind of research we do. There will also be an exhibition from the historical archives in the library.



NASA

CSF@Institute for Manufacturing

Charles Babbage Road, CB3 0FS

1pm–5pm

Map: 65, Hands-on, All ages (unless otherwise stated)

FantasTech

Activities from our inkjet and photonics experts: create your own laser etched metal ID card, see water droplets frozen in mid air, and use a laser to power your rocket along the wire.

Event: 225

Laser lab tours

Get a glimpse of the latest laser technologies and find out how they are used in industry. Watch a focused ion beam etch some of the tiniest pictures and text possible and witness lasers cutting through metals up to 30mm thick.

Event: 226, Age 8+

Raspberry Pi at the IfM

Meet the creators of the revolutionary Raspberry Pi low-cost computer, with demos and competitions.

Event: 227

Watch it made

Design and make your own watch from scratch! Choose the components, enter the manufacturing zone and discover different engineering processes. Finally assemble your watch with a unique machine developed at Cranfield University.

Event: 228, Age 8+

Around the City

10am–1pm

The final frontier of fiction: space exploration in popular literature

Cambridge University Library, West Road, CB3 9DR

An engaging display of science fiction books and magazines from the University Library's collections. Explore how the fears and fantasy of space travel have fuelled the imagination of writers throughout the 20th Century and beyond.

Event: 233, Map: 9, Exhibition, All ages

What would you use THAT for?

Try out some of the latest science based products from local companies and win a prize for thinking of the best ways to use them.

Event: 229, Age 8+

Sustainability games

Fun and interactive lessons from our experts in industrial sustainability.

Event: 230, Age 8+

1.15pm–2pm, 3.15pm–4pm

How engineers make the world a better place

Dr Tim Minshall and our students show the ways engineers improve our lives. From food, medicine and transport to communication, engineers are now using technologies such as 3D printing, smartphones and solar energy to transform lives.

Event: 231, Talk, Age 8+, Pre-book*

2pm–4pm

Pecha Kucha challenge

Graduate engineering students take on the challenge of sharing their research with you in just 6 min 40 sec. Will they succeed?

Event: 232, Talk, Age 12+

10am–3.30pm

Wandlebury wildlife

Stable Rooms, Wandlebury Country Park, Gog Magog Hills, CB22 3AE

Join us for a day of guided tours, small mammal and moth live trapping, pond life investigations, children's craft activities, scavenger hunts and more.

Event: 234, Map: online, Hands-on, Tour, All ages, Parking charges apply

10.30am–11.45am, 1pm–2.15pm, 3pm–4.15pm

Trees: titans of the plant world

Botanic Garden, Brookside, CB2 1JE

Trees are not only some of our largest and longest-living neighbours but also some of the most useful. This walk looks at some of the trees in the Botanic Garden, covering their traditional, present day and possible future uses.

Event: 235, Map: 3, Tour, Age 15+, Pre-book*



10.30am–3pm

Earth Sciences: laboratory open day

Sedgwick Museum of Earth Sciences,
Downing Street, CB2 3EQ

Visit the Sedgwick Museum and explore a lab. Get hands-on with unusual rocks, see thin section analysis in action and create your own paper thin section to keep. Learn how light interacts with rocks and the geological world and see how it affects the Sedgwick Museum's famous collections.

Event: 236, Map: 60, Hands-on, Age 8+

2pm–3pm

Printmaking under the southern sun

Museum of Archaeology and Anthropology,
Downing Street, CB2 3DZ

A demonstration of the traditional art of fine art etching and relief printing by Anne Virgo, Director and Martin King, printer from Australian Print Workshop. Anne and Martin will talk about their extensive projects working with Indigenous Artists in remote communities across Australia.

Event: 237, Map: 57, Talk, Age 12+

5.30pm–7pm

The science of morality

Lord Ashcroft International Business School,
Anglia Ruskin University, East Road, CB1 1PT

The Cambridge Humanist Group brings together Julian Huppert MP, Kenan Malik, Raymond Tallis, Rev Alasdair Coles and Peter Cave to help us understand the impact science is having on the understanding of human morality.

Event: 238, Map: 1, Talk, Age 15+, Pre-book*

6.30pm–9.45pm

Why are stringed instruments so hard to play?

West Road Concert Hall, West Road, CB3 9DP

Professor Jim Woodhouse gives a pre-concert talk which shows how computer modelling combined with acoustic measurements can shed light on playability of bowed string instruments. This talk is followed by a concert of works by Mussorgsky, Elgar and Tchaikovsky including the cello concerto by Elgar with soloist Olivia da Costa.

Event: 239, Map: 48, Performance, Age 8+,

Pre-book tel: 01223 300085

or visit: cco-online.org.uk, £18, £16

concessions, £8 students, £5 children under 14

CSF@Cambridge Union Society

9A Bridge Street, CB2 1UA

Map: 8

11am–12.30pm

Gender and conservation: does it matter?

As with most scientific fields, women have historically been underrepresented in environmental-science faculty positions and in conservation practice, particularly in positions of conservation leadership. This debate explores the ways in which biodiversity conservation could be different if there was more gender equality amongst its leaders and explores how this might be achieved.

Event: 240, Talk, Age 15+, Pre-book*

2pm–4pm

Show and tell with Robin Ince

Join Robin Ince as he brings his usual collection of punchy presentations from some of the best science presenters from Cambridge and beyond as they show off their favourite things from the world of science.

Event: 241, Talk, Age 12+

5pm–6.30pm

Drawing the line: how art engages with conservation

Nature is a resource for everybody so why is conservation seen as a science? Robin Ince hosts a discussion on the relationship of art and conservation. Joining him are artists Ackroyd and Harvey and sound artist Chris Watson amongst others who will give their personal experiences of the interface of these two disciplines and how collaborating has altered their work.

Event: 242, Talk, Age 15+, Pre book*

8pm–10pm

Robin Ince's reality tunnel

Robin picks up from his two previous shows about the human mind and investigates why we believe what we believe and tries to learn how we can know what isn't so.

Event: 243, Performance, Age 15+,

Pre-book tel: 01223 357851

or visit: cornex.co.uk, £8, £6 concessions

Science on Sunday: two

CSF@the Cambridge Biomedical Campus

Sunday 22 March

Our journey from bench to bedside continues at the Cambridge Biomedical Campus and this year we've even more of the site open to explore with hands-on activities and talks by leading medical research scientists. The new UTC (University Technical College) on Long Road welcomes the Naked Scientists and CRUK Cambridge Institute hosts talks and hands-on activities focusing on world-leading cancer research.

We recommend visiting the Cambridge Biomedical Campus by bus or bike but if you need to use a car, there will be reduced price parking available all day. Pick up a ticket at our Festival welcome desks.

Highlights

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Open your mind

A new journey through our mind with the Naked Scientists at the UTC on Long Road

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Infectious knowledge

Actor Stephen McGann, doctor on BBC's *Call the Midwife*, discusses the power of science in popular culture

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Hands off my health records

How health records have the power to transform treatments when we are ill

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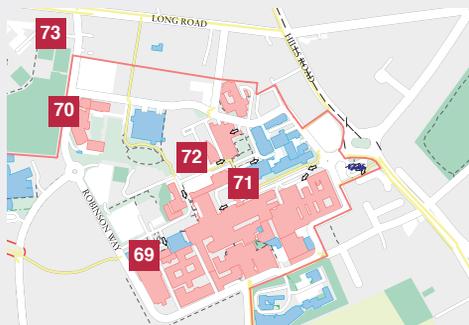
The giant nose and why snot?

Make your own (fake) snot and find out about our bodies' amazing standing army



CSF@the Clinical School (Talks)

Clinical School, Cambridge Biomedical Campus, Hills Road, CB2 0SP
 Map: 71, Talk, Age 12+ (unless otherwise stated), Pre-book*



- 69 Addenbrooke's Treatment Centre T, S, Li
- 70 Cancer Research UK Cambridge Institute T, S, Li
- 71 Clinical School T, S, Li
- 72 Deakin Centre T, S, Li
- 73 University Technical College T, S, Li

Lecture Theatre 2

11.15am–12noon

MEG and Me

Have you ever wondered how the brain works? We reveal the results of the public MEG and Me brain experiment looking at our dynamic brains doing things such as lying, being stressed and learning.

Event: 244, Age 15+

12.15pm–1.15pm

Talks from Cambridge Institute for Medical Research

Preventing heart attacks and strokes

Professor Jim Huntington discusses the potential of new anti-coagulant therapies.

Type 1 diabetes: halting the damage

Dr Frank Waldron-Lynch talks about exciting new research into a novel treatment of Type 1 diabetes.

Event: 245

1.30pm–2.15pm

Shining light on the newborn brain

Brain injury is a major problem facing premature infants. Using light Dr Topun Austin shows how we reconstruct 3D images of blood flow in newborns.

Event: 246

2.30pm–3.15pm

Pioneers in hospital computing

Stephen Davies and Hilary Ritchie discuss the early days of the Addenbrooke's Computer Unit

Event: 247

William Harvey Lecture Theatre

11.30am–12.15pm

Neurosurgery and the innovative neurosurgical microscope

Dr Rikin Trivedi shows how this technology helps us to operate in ways we could once only dream of.

Event: 248

12.45pm–1.30pm

Head injury: a survivor's story

Professor Peter Hutchinson and James Piercy give an insight into the effects of head injury, what surgery can achieve and what patients can do for themselves.

Event: 249

2pm–3pm

Infectious knowledge: science in popular culture

Communicating the science we discover is as important as the discovery itself. Stephen McGann, British actor from BBC's *Call the Midwife* and keen science communicator, will talk about the power of science and its place at the heart of public conversation.

Event: 250

3.30pm–4.30pm

Cambridge University Hospital Chair's Lecture: a stroll through critical illness

The Chair of CUH, Jane Ramsey welcomes everyone to this lecture by Dr Vilas Navapurkar which takes us behind the doors of intensive care.

Event: 251

CSF@the UTC Cambridge

UTC Cambridge, Robinson Way, CB2 0SZ

10.30am–2.30pm

Open day

Tours, talks activities and mini-challenges with students at the new UTC.

11.30am–12.30pm

Open your mind with the Naked Scientists

Join Dr Hannah Critchlow and Ginny Smith to take a journey through your nervous system, electrocute your senses, read your brainwaves and enter a different state of reality!

Event: 252, Map: 73, Talk, Age 8+, Pre-book*

CSF@the Clinical School (Hands-on)

11am–4pm

Hands-on, Age 8+ (unless otherwise stated)

All sweetness and light?

How can getting out and about in the sunlight be good for you? And how do we eat right to get lighter not heavier? Learn how scientists at the MRC Epidemiology Unit and the Centre for Diet and Activity Research use the latest techniques and technologies to shed light on what the answers to these questions mean for you.

Event: 253

Cambridge Science Festival in the classroom: a library

Have you ever wanted access to the Cambridge Science Festival year round, or take the hands-on activities into your classroom or community group? This new online library of available educational activities gives you all the information you need: Key-Stage and subject-specific information, as well as how to borrow these free resources. Find the library at: cam.ac.uk/science-festival.

Event: 254, Adults

Energy and oxygen radicals

Using computer games, scientists from the MRC Mitochondrial Biology Unit demonstrate how free radicals cause damage and reveal how the cell fights back!

Event: 255

Fantastic fat

Why do we need fat? Have you ever wondered what fat does and where it comes from? Discover some fascinating facts about fat and why it is so important with the help of scientists from the Metabolic Research Laboratories.

Event: 256

Illuminating statistics

Learn how the MRC Biostatistics Unit collects medical data and analyses it using statistics to improve public health. Test your reaction time, see how random you are, how good you are at learning the weight of sweets and whether you can count ducks. See statistics shine a light on numbers.

Event: 257

Lighting the way to new drug therapy

Join AstraZeneca's scientists and learn, through hands-on activities, how we use light-based technologies to identify, develop and test the activity of our new medicines. Once an active drug is selected we show how we use light to follow it as it travels through different parts of our body.

Event: 258

Minding the gap: advancing medicine through unifying care and research using clinical informatics

See how Addenbrooke's and the University are working together to advance medicine with electronic health information. Use our anonymisation programme to see how you vanish into a crowd and become unidentifiable even to yourself! Play with computer applications used by doctors and innovate and share your ideas for advancing health; you might even make a medical breakthrough!

Event: 259, Age 12+

Surgery simulation: conduct your own operation

Papworth Hospital will be showcasing exciting new ways of training doctors and nurses using simulation equipment. Hear from one of our doctors about how they perform a surgical procedure and have the opportunity to take part in the simulation yourself.

Event: 260, Age 12+

Shedding light on bioprocessing

Join MedImmune scientists and conduct model experiments to show how we obtain our biologic medicines (antibodies and other therapeutic proteins) from the cells that make them. Run tests to find out how much biologics have been made and how good they are.

Event: 261

Meet the scientists

Find out more about our scientists, their career paths and why they love what they do.

Event: 262, Age 12+



CSF@the Deakin Centre

Cambridge Biomedical Campus, Hills Road, CB2 0QQ

11am–3pm

Map: 72, Hands-on

Health psychology lab

Are you ready to become a 'lab rat' for the day? Visit the Health Psychology Lab, run by the Behaviour and Health Research Unit team from the Institute of Public Health. Take part in a series of mini-experiments to discover how our environment shapes our behaviour.

Event: 263, Age 8+

In sickness and in health: cells in the spotlight

Join researchers from the Cambridge Institute for Medical Research to learn about the wondrous ways of cells and what goes wrong in disease and infection. See how microscopes and movies allow us to watch cells in action. Learn about the cell's own transport system and look inside the serial killer T-cells that protect us against infection.

Event: 264, All ages

Stem cell discoveries

Find out about the amazing world of stem cells. Watch short stem cell films, take part in hands-on activities, and talk to researchers working in the field about the latest advances. Adults can also win a tour of the Stem Cell Institute, led by one of our top researchers. Further information at: stemcells.cam.ac.uk/public-engagement/sciencefestival2015/

Event: 265, Age 8+

The giant nose and why snot?

A ginormous nose that you can actually crawl into? Yes, please! And another chance to make snot and talk about what it is and why we make it. Welcome to the wonderful world of immunology!

Event: 266, All ages

CSF@CRUK Cambridge Institute

Cancer Research UK Cambridge Institute, Robinson Way, CB2 0RE

11am–4pm

Map: 70

11am–4pm

Discover more about cancer research

Join researchers from the Cambridge Cancer Centre to discover more about personalised medicine, targeted therapies and research into early detection of cancer. Get hands on with games; make your own cell; put on a lab coat, prepare slide samples and view them on a microscope; find out if you are a super taster.

Event: 267, Hands-on, All ages

12.30pm–1.15pm

Today's match: cancer vs treatment

Mathematician Dr Florian Markowetz from Cancer Research UK Cambridge Institute explains cancer evolution and diversity using football as an analogy.

Event: 268, Talk, Age 12+, Pre-book*

1.30pm–2.30pm

Hands-off my health records: why sharing your health data matters

Organised by Cambridge Institute of Public Health

The perils of data sharing have hit the headlines but this panel discussion will explore how health records have the power to transform treatments when we are ill and boost research efforts to help us live longer with fewer health problems.

Event: 269, Talk, Age 15+, Pre-book*

3pm–3.45pm

What is cancer and what are we doing about it?

Hear why Dr Alasdair Russell from Cancer Research UK Cambridge Institute believes that in order to break cancer, you must first be able to build it. Alasdair uses a cell biology approach to understand how cancer forms and to find new ways to exploit any weaknesses he finds.

Event: 270, Talk, Age 12+, Pre-book*

11am–4pm

Take a look behind the scenes and discover what makes CUH tick!

Addenbrooke's Treatment Centre, Keith Day Road, CB2 0SL

Cambridge University Hospital is your local hospital, a leading national centre for specialist treatment and part of the biggest biomedical research centre in the UK. This is your chance to delve into the hi-tech science, research and innovation underway in the hospital. We bring you a day of activities and scientific discoveries – your chance to experience the science behind medicine – with hands-on exhibits and staff to answer your questions.

Look back at our archive from 1766 and hear about Cambridge and the experimental computer programme. Look forward to the development of the Cambridge Biomedical Campus and the future for science and research. Look into careers in science and medicine by talking to staff who are keen to share their knowledge and experience.

Among the exhibits you will be able to have a go at keyhole surgery, see how robots and computers are helping with patient care and walk through a giant inflatable colon. Experience how dance classes are helping the elderly recover after a fall, listen to our experts share their knowledge on brain injury, 3D imaging techniques, hearing loss, intensive care medicine and imaging the newborn baby brain, and see a demonstration of the da Vinci robot which takes surgery beyond the limits of the human hand.

Event: 271, Map: 69, Hands-on, All ages



CHRIS LOADES

Around the city

11am–11.30am, 2pm–2.30pm

A trick of the light? How petal surfaces attract pollinators

Botanic Garden, Brookside, CB2 1JE

Discover how structures on petal surfaces attract pollinators. This short informal talk, led by Professor Beverley Glover, Director of the Botanic Garden, is the first of a new six-part Science on Sundays talks.

Event: 272, Map: 3, Talk, Adults, Normal admission charges apply



UNIVERSITY OF CAMBRIDGE BOTANIC GARDEN

2pm–5pm

Light entertainment

Cambridge Museum of Technology, Cheddars Lane, CB5 8LD

Discover how light was used to provide entertainment in the 19th Century. We'll be projecting some magic lantern slides using our own lantern and you can build your own camera obscura.

Event: 273, Map: online, Workshop, Age 8+, £3.50, concessions £2, children £1.50

3pm–4.45pm

Medicine and the ancient Olympic Games

The Fitzwilliam Museum, Trumpington Street, CB2 1RB

Do you ever wonder how the ancient Greeks perceived the relationship between athletics and medicine? Learn more in this talk by Dr Spyros Retsas, followed by a tour of the Ancient Greece and Rome galleries by a museum curator.

Event: 274, Map: 39, Talk, Tour, Adults, Pre-book tel: 01223 332904, email: education@fitzmuseum.cam.ac.uk or visit: fitzmuseum.cam.ac.uk/

Accessibility

The Festival takes place across dozens of locations, each with their own architectural style, character and level of accessibility. We have indicated available facilities at our venues to help you plan your visit. We can make arrangements by request.

For further information about accessibility, please contact the Festival by email: csf@admin.cam.ac.uk; or call: 01223 766766, Monday to Friday, 10.30am–4pm. The Cambridge University Disability Access Guide, including maps, is available here: www.cam.ac.uk/disability

We use the following codes

Toilet, wheelchair accessible	T	Lift to all floors	Li
Step free access	S	Induction loop for hearing aids	I
Partial access, enquire for details	PA		

Cambridge city map

1 Anglia Ruskin University	Call: 0845 2713333
2 Arts Picturehouse	T, S, PA, I
3 Botanic Garden	T, S
4 Cambridge Buddhist Centre	T, PA
5 Cambridge Corn Exchange	T, S, Li, I
6 Cambridge Junction	T, S, I
7 Cambridge Science Centre	T, S
8 Cambridge Union Society	T, PA
9 Cambridge University Library	T, S, PA, I
10 CB2 Cafe	T, PA
11 Christ's College	T, S, PA
12 Churchill College	T, S, PA
13 Clare College (Memorial Court)	T, S, Li
14 Department of Biochemistry (Sanger)	T, S
15 Department of Chemistry	T, PA
16 Department of Engineering	T, S, Li
17 Department of Pharmacology	T, S, Li, I
18 Department of Zoology	T, S
19 Donald McIntyre Building	T, S, Li
20 Downing College	T, S, Li, I
21 Friends Meeting House	PA
22 Grafton Shopping Centre	T, S, Li
23 Great St Mary's Church	T, S, I
24 Gurdon Institute	T, S, Li, I
25 Hughes Hall	T, S, Li
26 Judge Business School	T, S, Li
27 King's College	T, S, Li
28 Lady Mitchell Hall	T, S, Li, I
29 Lucy Cavendish College	T, S
30 Mill Lane Lecture Rooms	T, S, Li
31 MRC Cognition and Brain Sciences Unit	T, S, Li, I
32 Murray Edwards College	T, S, Li, I
33 Museum of Classical Archaeology	T, S, PA
34 PostDoc Centre	PA
35 Sainsbury Laboratory	T, S, Li, I
36 St Catharine's College, McGrath Centre	T, S, Li
37 St Columba's Hall	T, S, Li, I
38 St John's College	T, S, Li, I
39 The Fitzwilliam Museum	T, S, I
40 The Guildhall	T, S, Li
41 The Open University	T, S, Li
42 The Pitt Building	T, S, Li, I
43 The Polar Museum	T, S, Li
44 The Portland Arms	PA
45 Tourist Information Centre	S, I

46 University Centre	T, S, Li
47 Wesley Methodist Church	T, S, I
48 West Road Concert Hall	T, S, I
49 Whipple Museum of the History of Science	T, S, Li

Downing Site

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50 Anatomy Lecture Theatre	T, S, Li
51 Department of Biochemistry (Hopkins)	T, S
52 Department of Earth Sciences	T, PA
53 Department of Geography	T, S
54 Department of Pathology	T, S, Li, PA
55 Department of Psychology	S, Li
56 McDonald Institute for Archaeological Research	T, S, PA, I
57 Museum of Archaeology and Anthropology	T, S, Li, I
58 Physiology Building	T, S, Li
59 Plant Sciences Marquee	S
60 Sedgwick Museum of Earth Sciences	T, PA, Li

West Cambridge Site

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61 Cavendish Laboratory	T, S, Li, I
62 Centre for Mathematical Sciences	T, S, Li, I
63 Department of Materials Sciences and Metallurgy	T, S, Li, I
64 Hauser Forum	T, S, Li
65 Institute for Manufacturing	T, S, Li, I
66 Institute of Astronomy	T, PA
67 Isaac Newton Institute for Mathematical Sciences	T, S, Li, I
68 University of Cambridge Sports Centre	T, S, Li

Cambridge Biomedical Campus

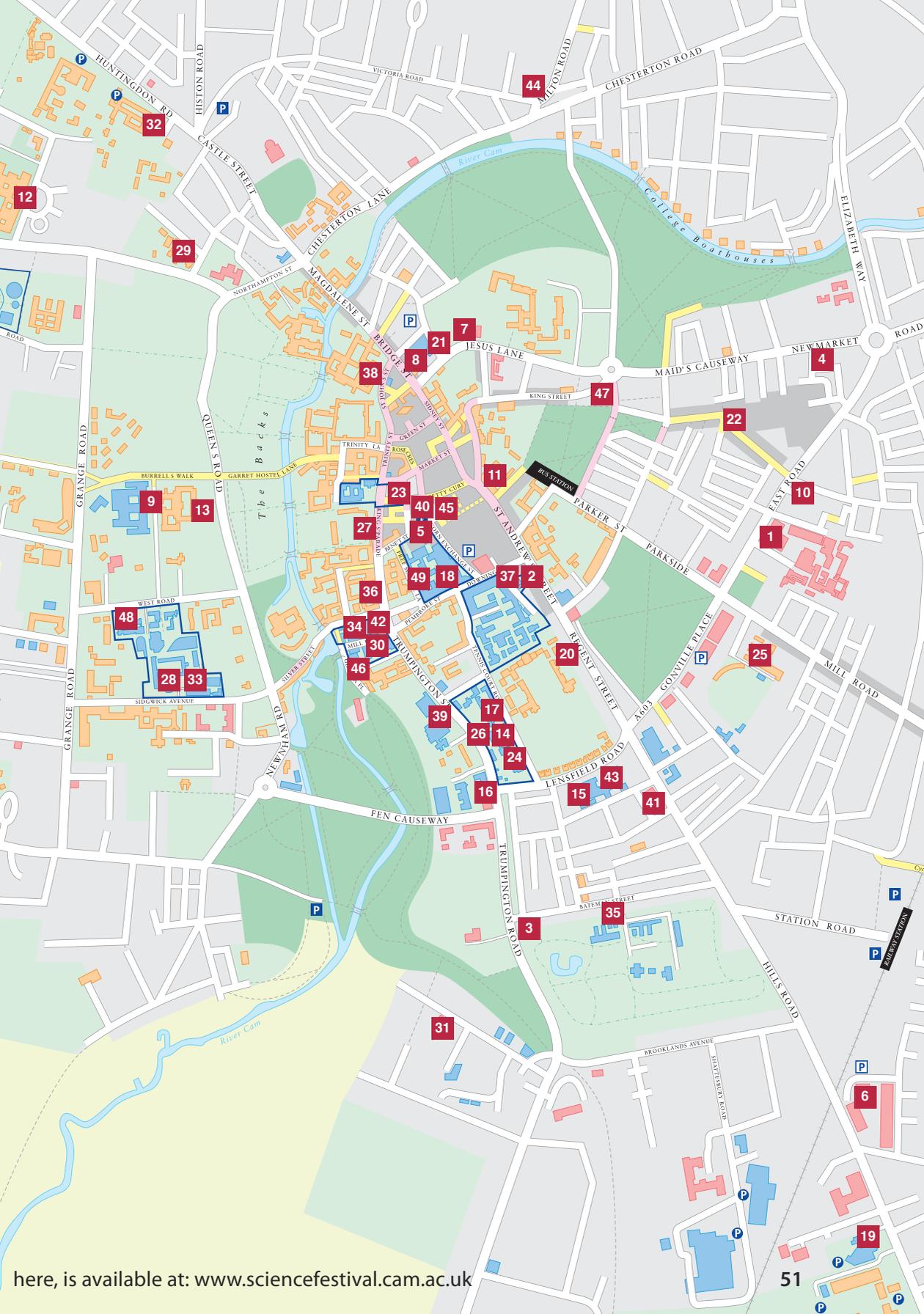
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69 Addenbrooke's Treatment Centre	T, S, Li
70 Cancer Research UK Cambridge Institute	T, S, Li
71 Clinical School	T, S, Li
72 Deakin Centre	T, S, Li
73 University Technical College	T, S, Li

Venues not listed on map

Cambridge Museum of Technology	T, S
Cambridge Regional College	T, S, Li
Institute of Continuing Education, Madingley Hall	T, S
Royal Society of Chemistry	T, S, Li
Shepreth Wildlife Park	T, S
Wandlebury Country Park	T, S, PA





here, is available at: www.sciencefestival.cam.ac.uk

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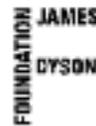


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