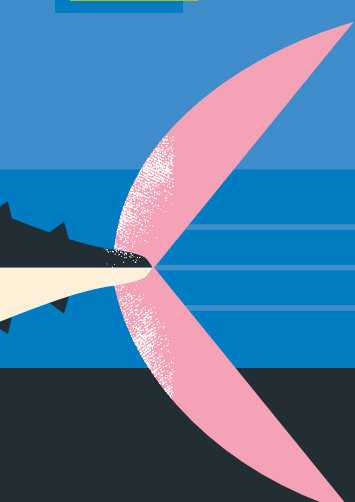
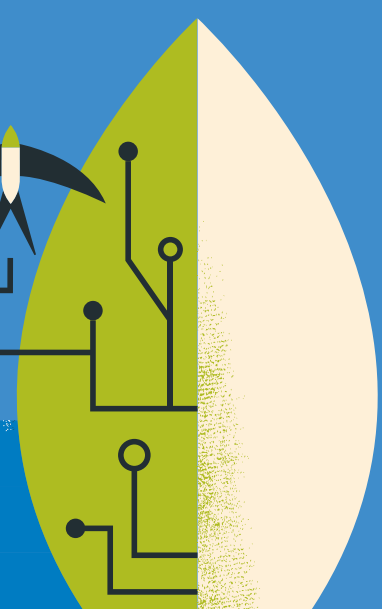
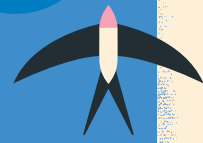
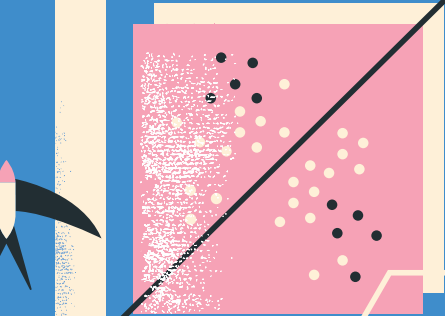
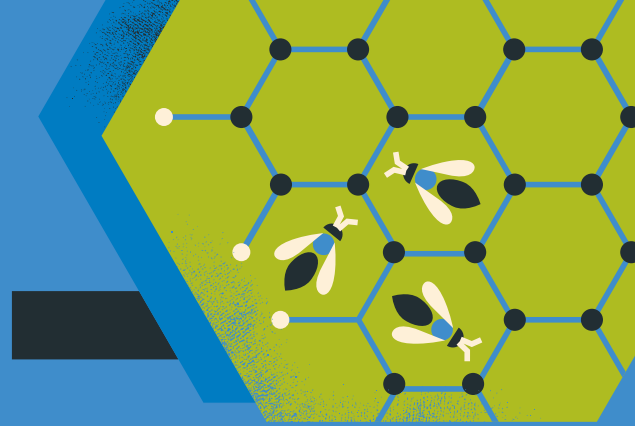




UNIVERSITY OF  
CAMBRIDGE

# Science Festival



10 – 23 March 2014  
[www.cam.ac.uk/science-festival](http://www.cam.ac.uk/science-festival)

# Welcome

Welcome to the 20th Cambridge Science Festival, where we invite you to explore our theme of structures and patterns at over 250 events for all ages, many of which are free of charge.

Meet the people searching for patterns in our genes to help improve health (eg. events 32, 52 and 241). Explore for yourself the structures of crystals in our Earth (36, 172 and 196), in the sky (190) or in the Guinness Book of World Records (123). Discover how city plans (21) and star maps (12) have changed over the centuries.

Like the expanding Universe, the Science Festival is growing. For the weekend of 15 and 16 March we're taking over the Corn Exchange and on Sunday 23 March, we are delighted to include for the first time, the Cambridge Biomedical Campus, home of Addenbrooke's Hospital and the Clinical School.

The programme pages are colour coded to help you find out what's on. Booking is only required where mentioned and unless otherwise stated is available at [www.cam.ac.uk/science-festival](http://www.cam.ac.uk/science-festival) or by calling 01223 766766. Booking opens at 10am on 3 February and lines are open Monday – Friday, 10am – 4.30pm. Booking closes 24 hours before the event takes place. We're a very small team so please keep trying if you can't get through first time or book via our website.

## Download the free Festival app

The Cambridge Science Festival mobile app is available for Android and iPhone. Search, book and organise your events, access videos and competitions, and be the first to hear Festival news. Features include a personal Festival planner with reminder options and maps to help plan your perfect Festival.

**Find the app on iTunes or Google Play, or visit:**  
[www.cam.ac.uk/csf/app](http://www.cam.ac.uk/csf/app)

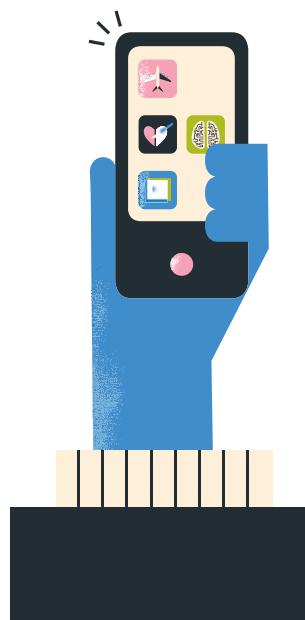
**Visit:** [www.cam.ac.uk/science-festival](http://www.cam.ac.uk/science-festival) **for the latest updates on events and follow us on:**



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



[#camscience #csf2014](https://www.twitter.com/camscience)



# Throughout the Festival

**Monday 10 – Friday 21 March**

**The Science Festival starts here!**

Welcome to the first week of events at the Science Festival: the programme is packed with talks, tours and discussions on a range of topics from healthy brains, the science of cycling and making machines that see, to exploring our Universe from its beginnings.

Events in these pages (p4 – 12 and p31 – 36) colour coded pink, are listed chronologically by time and date and show the type of activity, the appropriate age and whether you need to pre book. Access information for all venues is provided at the end of this programme alongside a map of the city centre events to help you navigate your way around Cambridge.

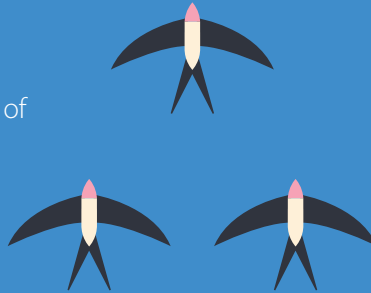
We have over 250 events on offer at the Science Festival this year, with something for everyone, whatever your age and interests.

## Highlights

Page 11

### Isaac Newton's camera

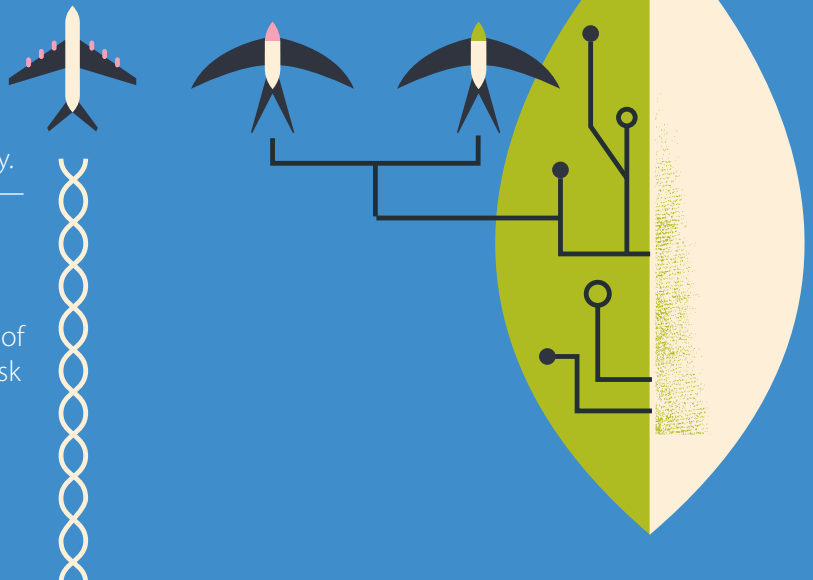
Looking at the last twenty years of the Science Festival in an exhibition that plays with the colour spectrum.



Page 12

### Talking science: what next?

Join the Vice Chancellor and guests as we discuss science and its impact on society.



Page 31

### Icarus at the edge of time

A musical re-imagining of the Greek myth as we ask what if Icarus travelled into a black hole?

**6pm – 9pm, Monday 17 February**  
**Star Trek: the math of Khan**  
 Arts Picturehouse, St Andrews Street,  
 CB2 3AR

The original Star Trek featured many futuristic ideas such as warp drives, transporters and travelling to strange new worlds. These have been discussed in great detail. But mathematician James Grime wants to take a different approach and asks, what about the maths of Star Trek? Sciscreen aims to bring science to life by linking talks from leading scientists with the science shown in movies.

**Event: 1, Map: 3, Film, Ages 8+, Pre book tel: 0871 902 5720, email: cambridge@picturehouses.co.uk or visit: www.picturehouses.co.uk/cinema/Arts\_Picturehouse\_Cambridge/, Normal admission charges apply**

**10am – 5pm, Wednesday 5 March – Wednesday 30 April (excluding weekends)**  
**International images for science exhibition 2013**

ArtCell Gallery, Cancer Research UK, Li Ka Shing Centre, Robinson Way, CB2 0RE

The exhibition provides a showcase for an extraordinary variety of scientific photography. The visually stunning images range from far-away galaxies to subatomic particles. Explore contemporary science through the best photography of research in action.

**Event: 2, Map: 75, Exhibition, Drop in, All ages**

**5.30pm – 7pm, Wednesday 5 March**  
**The meaning of success: insights from women at Cambridge**  
 West Road Concert Hall, West Road, CB3 9DP

To celebrate International Women's Day 2014, The Meaning of Success: Insights from Women at Cambridge book and website resources will be launched by the Vice-Chancellor. The book celebrates women from across the University, their stories and achievements. Lecture plus drinks reception.

**Event: 3, Map: 53, Talk, Ages 15+, Pre book tel: 012230765304, email: dj314@admin.cam.ac.uk or visit: www.cam.ac.uk/science-festival**

**10am – 4pm, Saturday 8 March**  
**Science while you shop**  
 Grafton Shopping Centre, CB1 1PS

Science buskers from the British Science Association Cambridgeshire branch will bring hands on science experiments and demonstrations for all ages to the Grafton Shopping Centre. Come and explore patterns that can trick your mind, the physics of wave patterns, the amazing diversity of natural structures and more!

**Event: 4, Map: 23, Hands on, Drop in, All ages**

**8am – 5pm, Monday 10 – Saturday 22 March (excluding Sunday 16 March)**  
**Inspiring images: engineering captured on camera**  
 The Michaelhouse Centre, Trinity Street,  
 St Michael's Church, CB2 1SU

From rainbow coloured liquid-crystal molecules, to tunnels deep under the ground, this year's entries from the University of Cambridge Department of Engineering photography competition help to bring engineering brightly and vividly to life.

**Event: 5, Map: 29, Exhibition, Drop in, All ages**

**10am – 4.30pm, Monday 10 – Sunday 23 March**  
**The plant pattern hunt**  
 Botanic Garden, Brookside, CB2 1JE

Self-led family trail. Can you discover all of the plant patterns hidden in the Botanic Garden? Pick up an explorer trail from the Garden ticket office and take a trip around the plant kingdom, collecting patterns as you go.

**Event: 6, Map: 4, Trail/Hands on, Drop in, All ages, Standard Garden admission charge for adults, accompanied children free**

**11.30am – 5.30pm, Monday 10 – Sunday 23 March, 7pm – 7.30pm, Monday 10, Saturday 15, Saturday 22 March (Live art performance)**  
**ABOUTNESS**

**See website for venue**

This exhibition invites you to experience the experimental visual responses to the neuroscientific research of Dr Tristan Bekinschtein, Dr Olaf Hauk, Dr Nikolaus Kriegeskorte and Professor Carsten Mehring. Using paintings, drawings, video installation, live art performance and in situ drawing, ABOUTNESS aims to challenge your perception and convey aesthetic impressions of current research in the brain sciences.

**Event: 7, Map: online, Exhibition/Performance, Drop in, All ages, Pre book\* (performance only) £3**

**4pm – 6pm, Monday 10 March**  
**Structures and patterns in music:**  
**composition workshop for GCSE**  
**students**

**St John's College, Divinity School Theatre,**  
**St John's Street, CB2 1TW**

Exploring the creative potential of structures and patterns in musical composition encountered in music by Sweelinck and Ligeti. Students will learn about the expressive world and technical possibilities of the harpsichord, including some unexpected extended techniques, working towards a collective composition taking inspiration from elements of variation technique and their connections with the natural world.

**Event: 8, Map: 42, Workshop, Ages 14 – 16,**  
**Pre book\***

**6pm – 7pm, Monday 10 March**  
**The world's oldest start up**

**Mill Lane Lecture Rooms, Mill Lane, CB2 1RW**  
**Supported by Cambridge University Press**

Come along and find out why the world's oldest publisher is disrupting its own model and taking the market by surprise through the use of new and innovative developments in online learning, Massive Open Online Courses (MOOCs).

**Event: 9, Map: 30, Talk, Ages 12+, Pre book\***

**7pm – 8.30pm, Monday 10 March**  
**Structures and patterns in music:**  
**concert**

**St John's College, Divinity School Theatre,**  
**St John's Street, CB2 1EW**

Jane Chapman juxtaposes Ligeti's iconoclastic harpsichord works with variations by Sweelinck and the premiere of a new work by Tim Watts, inspired by the Natural History Museum's dodo skeleton.

Jane will explore the creative potential of structures and patterns in these old and new works, shedding light on the connections between them.

**Event: 10, Map: 42, Performance, All ages,**  
**Pre book\***



CAMBRIDGE UNIVERSITY MUSEUM OF ZOOLOGY

**7.15pm – 9.15pm, Monday 10 March**  
**Only Christians believe in evolution,**  
**atheists don't believe at all?**

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

Dr Conor Cunningham, of the University of Nottingham Department of Theology and Religious Studies, will give his views on this topic in the Science meets Faith series organised by Wesley Methodist Church.

**Event: 11, Map: 52, Talk, Adults**

**7.30pm – 8.45pm, Monday 10 March**  
**What's new in space?**

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

**Sponsored by Science AAAS**

The Gaia satellite was launched in 2013 to determine the structure and history of our Galaxy. The Square Kilometer Array is being built to unravel the role of dark energy and dark matter. Telescopes like these produce unprecedented amounts of data requiring a new supercomputer, the Wilkes, to process them. How do these developments compare to Newton's discoveries and inventions? Join Dr Patricia Fara, Dr Rosie Bolton and Professor Gerry Gilmore to find out.

**Event: 12, Map: 39, Talk, Ages 12+, Pre book\***

**7.30pm – 8.30pm, Monday 10 March**  
**The Janus-faced interaction**  
**of plants and microbes**

**Sainsbury Laboratory, Bateman Street, CB2 1LR**

Dr Sebastian Schornack will reveal a fascinating world of dynamic interactions between microbial life and plants. He will explain some of the strategies microbes use to take control of a plant and how these can be exploited in biomedicine.

**Event: 13, Map: 37, Talk, Ages 15+, Pre book\***

**7.30pm – 9.30pm, Monday 10 March**  
**Science Festival ceilidh**

**Emmanuel United Reformed Church,**  
**Trumpington Street, CB2 1RR**

To celebrate the Festival, the Red Rock Ceilidh Band will be offering a ceilidh with special science-themed dances including The Very Large Hadron Collider, Wave-Particle Duality in 6/8 Time, Mr Schrödinger's Maggot and Nuclear Fusion...

**Event: 14, Map: 20, Performance, Ages 8+,**  
**Pre book email: [ed.emery@thefreeuniversity.net](mailto:ed.emery@thefreeuniversity.net),**  
**£7, £4 concessions and children under 12 free**

**Also on this day: Event 2**



**10am – 4pm, Tuesday 11 – Sunday 23 March (excluding Sunday 16 – Monday 17 March)**  
**Exploring the unknown: a sensory treasure hunt between St John's College Library and the Polar Museum**

**The Polar Museum, Lensfield Road, CB2 1ER**  
 Young explorers needed to undertake a mission of discovery! Historic explorers didn't have maps to help them find their way, so they looked for landmark objects and used their senses to map their surroundings. Forge your own trail through Cambridge, discovering as you go! Collect your trail from either venue. Takes approximately 45 minutes.  
**Event: 15, Map: 47, Hands on, Drop in, All ages**

**10.30am – 4.30pm, Tuesday 11 – Saturday 15, Tuesday 18 – Saturday 22 March**  
**12noon – 4.30pm, Sunday 16, Sunday 23 March**  
**Chiefs and governors: art and power in Fiji**  
**Museum of Archaeology and Anthropology, Downing Street, CB2 3DZ**

This is the first exhibition dedicated to Fijian art outside Fiji. It draws on MAA's collection of Fijian artefacts, photographs and archives, a collection closely linked to the early colonial history of Fiji and the foundation of the Museum.  
**Event: 16, Map: 61, Exhibition, Drop in, All ages**

**1pm – 5pm, Tuesday 11 – Friday 14, Tuesday 18 – Friday 21 March, 10am – 5pm, Saturday 15 – Sunday 16, Saturday 22 – Sunday 23 March**  
**Perception: get hands on with your senses**  
**Cambridge Science Centre, Jesus Lane, CB5 8BQ**

Is seeing believing? Find out how illusions can fool your brain and reveal how we really perceive the world around us. Visit our hands on exhibition about the senses. See our website for more details: [www.cambridgesciencecentre.org](http://www.cambridgesciencecentre.org)  
**Event: 17, Map: 8, Hands on/Exhibition, Drop in, All ages, Normal admission charges apply**

**1pm – 2pm, Tuesday 11 March**  
**The psychophysics of vision**  
**Whipple Museum of the History of Science, Free School Lane, CB2 3RH**

Most humans see in three primary colours, but why? Could there be people who see in more than three? What can we say about what that would be like? Does a digital camera work like an eye? The philosopher of physics Dr Adam Caulton will talk about what physics and psychophysics have contributed to our recent understanding of human and animal vision.

**Event: 18, Map: 54, Talk, Ages 12+, Pre book email: [HPS-events@lists.cam.ac.uk](mailto:HPS-events@lists.cam.ac.uk)**

**2.30pm – 4pm, Tuesday 11 March**  
**Thinking mathematically**  
**Faculty of Mathematics, Centre for Mathematical Sciences, Wilberforce Road, CB3 0WA**

Join Charlie Gilderdale to work on some of his favourite mathematical problems from the NRICH collection (<http://nrich.maths.org>), and discover that everyone can think mathematically. Come prepared to explore, discuss, conjecture, question, explain and generalise!  
**Event: 19, Map: 66, Workshop, Ages 14 – 15, Pre book tel: 01223 766839, email: [mmp@maths.cam.ac.uk](mailto:mmp@maths.cam.ac.uk) or visit: <http://mmp.maths.org/events-CSF14-Thinking>, Maximum group size of 15 students per school, plus up to 2 teachers**

**5pm – 8pm, Tuesday 11 March**  
**Snazzy structures in science**  
**Cambridge Regional College C019 / C133, Kings Hedges Road, CB4 2QT**

Practical sessions in Biology and Chemistry focusing on structures and patterns. These are followed by a short talk/questions from a visiting speaker. Biology: a hands on practical investigation using microscopes will focus on how different tissues including bone, blood and plant are designed to do their jobs. Chemistry: investigate chemical reactions involving the combination of crystal structures to make a product with different chemical and physical properties. This is an exciting practical exploring exothermic and endothermic reactions.  
**Event: 20, Map: online, Talk/Hands on, Ages 8+, Pre book (practicals only) tel: 01223 418580, email: [kedwards@camre.ac.uk](mailto:kedwards@camre.ac.uk) or visit: [www.camre.ac.uk](http://www.camre.ac.uk)**

**Also on this day: Events 2, 5, 6 and 7**



**5.30pm – 6.30pm, Tuesday 11 March**  
**Pictures, perspectives and plans**  
 Cambridge University Library, Milstein Seminar Rooms, West Road, CB3 9DR

An exploration of the changing styles in cartography used to map cities and towns, from the pictorial style and perspective views found in early printed mapping to the development of accurate scale plans. View and learn about some fascinating examples of mapping held in the University Library's collections from the fifteenth century to the present day.

**Event: 21, Map: 10, Talk, Ages 15+, Pre book\***

**6pm – 7pm, Tuesday 11 March**  
**Combinatorics: the mathematics that counts**  
 Mill Lane Lecture Rooms, Mill Lane, CB2 1RW  
 Supported by Cambridge University Press

Join Professor Robin Wilson as he discusses combinatorial mathematics, which is concerned with selecting, arranging and counting objects of various kinds. Included under its wide umbrella are permutations and combinations, graphs and networks, certain geometrical problems, and Sudoku puzzles. Our examples cover 3000 years, from Ancient China and India, via the Islamic world and the renaissance, to the present day.

**Event: 22, Map: 30, Talk, Ages 12+, Pre book\***

**7.30pm – 9.30pm, Tuesday 11 – Wednesday 12 March**  
**How to be immortal**

Mumford Theatre, Anglia Ruskin University, East Road, CB1 1PT

Three true tales intertwine in this intimate, bold and funny play about love, science, death and immortality. There's live music on cello and squeezebox, 1950s science and animations. A post-show discussion follows the performance on 11 March, with the cast and a scientist from UCL, on the theme 'What your genes say about you.'

**Event: 23, Map: 32, Performance, Ages 12+, Pre book tel: 01223 352932, email: mumford@anglia.ac.uk or visit: www.anglia.ac.uk/mumfordtheatre, £12.50, £10 concessions, £8.50 students**

**8pm – 9pm, Tuesday 11 March**  
**Cambridge stars: big ideas 1**  
 Mill Lane Lecture Rooms, Mill Lane, CB2 1RW

Royal Society Fellows are the most eminent scientists, engineers and technologists in the UK and Commonwealth, and Fellowships have been awarded annually since 1660. Six new Cambridge researchers were made Royal Society Fellows in 2013. Tonight we are delighted to welcome neuroscientist Professor Maria Grazia Spillanti, physicist Professor Ray Goldstein and astronomer Professor Gerry Gilmore to the Festival to introduce us to their research.

**Event: 24, Map: 30, Talk, Ages 12+, Pre book\***

**8pm – 9pm, Tuesday 11 March**  
**Overcoming stress and anxiety: healthy brains for a flourishing society**

Mill Lane Lecture Rooms, Mill Lane, CB2 1RW  
 Sponsored by the British Association of Psychopharmacology

Why is anxiety on the increase? Why do people react to stress differently? How can we develop resilience and wellbeing? Professor Barbara Sahakian will discuss these questions with Dr Annette Bruhl and Dr David Baldwin. Find out how our brains and bodies change when we are stressed and anxious and what pharmacological and psychological treatments are available for people with anxiety disorders.

**Event: 25, Map: 30, Talk, Ages 12+, Pre book\***

**1.15pm – 2pm, Wednesday 12 March**  
**Stalking Egyptian blue: making and investigating the first synthetic pigment**  
 The Fitzwilliam Museum, Seminar Room, Trumpington Street, CB2 1RG

Find out about making and investigating the first synthetic pigment by Jennifer Merchant and Abigail Graville, Conservators (Antiquities).

**Event: 26, Map: 43, Talk, Adults, Admission is by token, available from the Courtyard entrance desk from 12.45pm on the day**



### 4pm – 5pm, Wednesday 12 March **Poincaré and Einstein on geometry: how do they look today?**

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

Philosopher and physicist Brian Pitts will talk about how the latest particle physics work on gravitation relates to the famous work of Einstein and Poincaré on geometry.

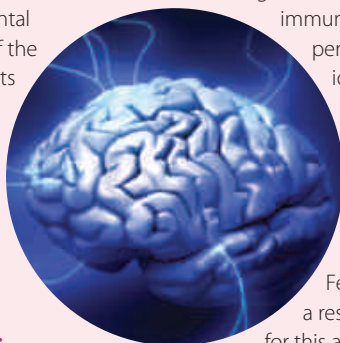
**Event: 27, Map: 54, Talk, Ages 12+, Pre book email: [HPS-events@lists.cam.ac.uk](mailto:HPS-events@lists.cam.ac.uk)**

### 4pm – 5pm, Wednesday 12 March **The neuroscience of self: how the brain creates 'me'**

Anglia Ruskin University, East Road, CB1 1PT

How does the brain generate self-consciousness? How does it distinguish between self and world? In this talk Dr Jane Aspell will discuss recent evidence from neuroscience that the fundamental basis of the self is the brain's model of the body. She will also discuss experiments in which self-consciousness is manipulated in experiments with healthy subjects and will also present the neuroscientific explanation of out of body experiences in which the self seems to be located outside of the body.

**Event: 28, Map: 2, Talk, Adults, Pre book tel: 0845 196 5060, email: [miriam.berg@anglia.ac.uk](mailto:miriam.berg@anglia.ac.uk) or visit: [www.anglia.ac.uk/communityevents](http://www.anglia.ac.uk/communityevents)**



### 6pm – 8.30pm, Wednesday 12 March **Brains and building blocks** MRC Cognition and Brain Sciences Unit, 15 Chaucer Road, CB2 7EF

Come and find out more about the brain and the building blocks of our research. There will be an hour of hands on activities and experiments, followed by three different short talks by our leading scientists. Light refreshments will be served (tea, sandwiches).

**Event: 30, Map: 31, Talk, Ages 15+, Pre book tel: 01223 355294, email: [mandy.carter@mrc-cbu.cam.ac.uk](mailto:mandy.carter@mrc-cbu.cam.ac.uk) or visit: [www.mrc-cbu.cam.ac.uk](http://www.mrc-cbu.cam.ac.uk)**

### 6.30pm – 7.30pm, Wednesday 12 March **Why cats make you sneeze: new research from immunology** Mill Lane Lecture Rooms, Mill Lane, CB2 1RW

Allergic reactions are the result of the immune system overreacting to a perceived danger. Instead of identifying and responding to a virus or bacteria it misidentifies the allergens and mounts an immune response. Professor Clare Bryant shows how the most common cause of severe allergic reactions to cats, the FelD1 protein in dander, triggers a response and considers therapies for this and other allergies.

**Event: 31, Map: 30, Workshop, Ages 12+, Pre book\***

### 5pm – 6pm, Wednesday 12 March **WiSETI lecture: growing organs and other small challenges**

Robinson College, Auditorium, Grange Road, CB3 9AN

Professor Molly Stevens heads a large multidisciplinary team, from surgeons to engineers, specialising in biomedical materials and regenerative medicine at Imperial College London. She has won multiple prestigious scientific prizes and was one of The Times top ten scientists under the age of 40 in 2010. She hopes to encourage other women in academia to feel able to balance work and home lives. This is WiSETI's flagship annual event, sponsored by Schlumberger Cambridge Research, where a distinguished woman scientist is invited to speak about her life and work.

**Event: 29, Map: 35, Talk, Ages 15+, Pre book tel: 01223 0760424, email: [vmh23@cam.ac.uk](mailto:vmh23@cam.ac.uk) or visit: [www.cam.ac.uk/science-festival](http://www.cam.ac.uk/science-festival)**

### 7pm – 8.30pm, Wednesday 12 March **Finding patterns in genes and proteins**

Wellcome Trust Genome Campus,  
EBI South Building, Hinxton, CB10 1SA

How are computers helping scientists to make sense of huge data sets and understand the biology of our cells? Dr Sarah Teichman of the EMBL-European Bioinformatics Institute (EBI) and Wellcome Trust Sanger Institute will talk about her work and provide new insights into how genes are switched on and off, and how protein complexes are assembled.

**Event: 32, Map: online, Talk, Ages 15+, Pre book tel: 01223 496995, email: [pubengage@sanger.ac.uk](mailto:pubengage@sanger.ac.uk) or visit: [www.cam.ac.uk/science-festival](http://www.cam.ac.uk/science-festival)**

Also on this day: Events 2, 5, 6, 7, 15, 16, 17 and 23



**7.30pm – 9pm, Wednesday 12 March**  
**Stan's Café: Anatomy of Melancholy**  
 Cambridge Junction, Clifton Way, CB1 7GX

Nearly four hundred years ago, shortly after the publication of the King James Bible and Shakespeare's First Folio, vicar and librarian Robert Burton completed *The Anatomy of Melancholy*, a 1,500 page long attempt to identify the symptoms, causes and cures of kinds of melancholy. Extraordinary, hilarious and profound, it has been described by many as the greatest book ever written.

**Event: 33, Map: 7, Performance, All ages,**  
**Pre book tel: 01223 511511 or visit:**  
**[www.junction.co.uk](http://www.junction.co.uk), £12, £8 concessions**

**7.30pm – 9.30pm, Wednesday 12 March**  
**Climate change:**  
**can we take charge?**

**Friends Meeting House, Aldren Wright Room,**  
**Jesus Lane, CB5 8BA**

Most of us want to do something about climate change. But why do we often fail to take action? Why does it seem difficult to adopt a lower carbon lifestyle? This workshop, by Cambridge Carbon Footprint, invites participants to reflect on the patterns and structures in our feelings, habits and social settings, which stand in the way of a more sustainable lifestyle.

**Event: 34, Map: 21, Workshop, Ages 15+,**  
**Pre book tel: 01223 301842, email:**  
**[info@cambridgecarbonfootprint.org](mailto:info@cambridgecarbonfootprint.org) or visit:**  
**[www.cambridgecarbonfootprint.org](http://www.cambridgecarbonfootprint.org)**

**8pm – 9pm, Wednesday 12 March**  
**What's wrong with pink?**

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

As a neuroscientist, Professor Melissa Hines studies gender development. One of her areas of research focuses on why certain toys are embraced by different genders. Why do girls choose pink dolls, while boys play with vehicles of pretty much any colour, as long as it is not pink? Find out the answers to these questions and how they illuminate both how humans develop and how societal pressures act upon children.

**Event: 35, Map: 30, Workshop, Ages 15+,**  
**Pre book\***

**10.30am – 11am, 11.30am – 12noon,**  
**2.30pm – 3pm, 3.30pm – 4pm, Thursday 13,**  
**Thursday 20 March**

**Rough and rocky guides to**  
**structures and patterns in**  
**the history of life**

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

A series of short guided tours through the displays of the Sedgwick Museum offers a special opportunity to interpret structures and patterns in the history of life.

**Event: 36, Map: 64, Tour, Ages 8+, Pre book\***

**12.30pm – 3pm, Thursday 13 March**  
**Life sciences poster and**  
**image exhibition**

**Cormack Room, University Centre, Granta Place,**  
**Mill Lane, CB2 1RU**

**Sponsored by Linguamatics**

Exhibition of work from early career academic researchers in the life sciences at the University of Cambridge. If you've ever wondered what scientists beginning their research at the University actually work on, then come along and meet them. View posters and images from their research, designed for public communication. Topics in the past have ranged from how cuckoos can recognise the patterns on the eggs of other birds, through to the the molecular biology behind ageing.

**Event: 37, Map: 51, Exhibition, Drop in,**  
**Ages 15+,**

**1pm – 2pm, Thursday 13 March**  
**What is matter?**

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

We all know that matter is made of atoms, which are made of particles. But what are particles, according to modern physics? Hard and tiny lumps; or some sort of cloud made up, in some way, out of a field? Philosopher of physics Dr Jeremy Butterfield will talk about what modern physicists think particles are.

**Event: 38, Map: 54, Talk, Ages 12+, Pre book**  
**email: [HPS-events@lists.cam.ac.uk](mailto:HPS-events@lists.cam.ac.uk)**

KTLR



**2.30pm – 4pm, Thursday 13 March**  
**Convincing yourself, convincing others****Centre for Mathematical Sciences, Wilberforce Road, CB3 0WA**

Join Charlie Gilderdale from the University's NRICH project (<http://nrich.maths.org>) to work on some favourite mathematical problems that will challenge you to notice patterns, develop convincing arguments and refine your powers of persuasion.

**Event: 39, Map: 66, Workshop, Ages 11 – 13, Pre book tel: 01223 766839, email: [mmp@maths.cam.ac.uk](mailto:mmp@maths.cam.ac.uk) or visit: <http://mmp.maths.org/events-CSF14>-Convincing, Maximum group size of 15 students per school, plus up to 2 teachers**

**5pm – 6pm, Thursday 13 March**  
**Andrew Chamblin Memorial Lecture: The pointless Universe**  
**Lady Mitchell Hall, Sidgwick Site, Sidgwick Avenue, CB3 9DA**

Modern physics raises questions concerning phenomena on widely different distance scales. From the evolution of the whole Universe to microscopic properties of sub-nuclear particles, Professor Michael Green, recent winner of the Fundamental Physics Prize, will present a historical survey of the evolution of theoretical approaches to understanding such problems. He will also discuss recent ideas from String Theory that have the potential for unifying areas of physics that have previously appeared to be only remotely connected.

**Event: 40, Map: 27, Ages 15+, Talk, Pre book\***

**6pm – 7pm, Thursday 13 March**  
**The natural order of things: nature's place in the world of sustainable engineering****Mill Lane Lecture Rooms, Mill Lane, CB2 1RW**

Explore the importance of nature in engineering from the perspective of an engineer, a sustainability specialist and a business and diversity expert. Find out why it is critical to consider natural systems and ecology when designing, building and operating massive engineering projects.

**Event: 41, Map: 30, Ages 12+, Talk, Pre book\***

**6pm – 8.30pm, Thursday 13 March**  
**Look what chemistry has done for me****Royal Society of Chemistry, Thomas Graham House (290), Science Park, Milton Road, CB4 0WF**

An informal and informative event where you will hear several talks from men and women working in the chemical industry and academia. This event offers you an excellent opportunity to learn more from real chemists about possible careers options in Chemistry.

**Event: 42, Map: online, Talk/Networking, Ages 15+, Pre book visit: [www.rsc.org/Membership/Networking/ChemNet/forthcomingevents.asp](http://www.rsc.org/Membership/Networking/ChemNet/forthcomingevents.asp)**

**7pm – 8pm, Thursday 13 March**  
**SciBar: breaking and building bones****Arts Picturehouse, St Andrews Street, CB2 3AR**

Science in a bar! What happens when bones break and what materials can we use to repair them?

Come and explore the structure of bone tissue and implants from the perspective of materials science and engineering with Dr Rose Spear.

**Event: 43, Map: 3, Talk, Adults, Pre book email: [info@britishscienceassociation-cambridgeshire.org.uk](mailto:info@britishscienceassociation-cambridgeshire.org.uk), visit: [www.cam.ac.uk/science-festival](http://www.cam.ac.uk/science-festival)**

**7.30pm – 8.30pm, Thursday 13 March**  
**What a coincidence!****Lady Mitchell Hall, Sidgwick Site, Sidgwick Avenue, CB3 9DA**

Many of us experience bizarre coincidences, whether it's finding an unexpected connection to someone or bumping into friends in an odd place. Why do they happen and why do we take notice of them? Professor David Spiegelhalter will mine his database of coincidences to show what we consider surprising and then show how we can use the theory of probability to check how surprising our stories really are. Please submit coincidences to <http://understandinguncertainty.org/coincidences>.

**Event: 44, Map: 27, Talk, Ages 12+, Pre book\***

Also on this day: Events 2, 5, 6, 7, 15, 16 and 17

**7.30pm – 10pm, Thursday 13 March**  
**Phantom islands**

**The Polar Museum, Lensfield Road, CB2 1ER**

Have you ever seen something that wasn't really there? Discover the explorers who imagined whole islands. An introductory talk on the science and history of phantom islands followed by a screening of the 1970s film *The Island on the Top of the World*.

**Event: 45, Map: 47, Talk/Film, Ages 16+,**

**Pre book visit: [www.cam.ac.uk/science-festival](http://www.cam.ac.uk/science-festival)**

SIMON HALLIDAY



**9am – 5pm, Friday 14 – Monday 17 March**  
**Isaac Newton's camera: dismantling light with Prokudin-Gorskii method photography**

**Grand Arcade, St Andrew's Street, CB2 3BJ**

A digital recreation of the earliest known colour photographic technique and an exploration of what happens when you collect the different elements of the colour spectrum separately.

**Event: 46, Map: 24, Exhibition, Drop in, All ages**

**10am – 11.30am, Friday 14 March**

**Making friendshapes**

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

Toddlers with parents or carers are welcome to come and explore the land of shapes and patterns, taking part in various activities to stimulate the mind, and investigating the world around them.

**Event: 47, Map: 17, Hands on, Drop in, Ages 2 – 5, accompanied by parents/carers**

**3pm – 3.45pm, Friday 14, Friday 21 March**  
**Chiefs and governors: art and power in Fiji guided exhibition tour**  
**Museum of Archaeology and Anthropology, Downing Street, CB2 3DZ**

Special guided tour for the Science Festival of the chiefs and governors: art and power in Fiji exhibition.

**Event: 48, Map: 61, Tour, Ages 12+, Pre book email: [sjh201@cam.ac.uk](mailto:sjh201@cam.ac.uk)**

**4pm – 5pm, Friday 14 March**  
**Alex Hopkins lecture: strange material**

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

We are about to enter a new materials age, one that challenges the very notion of material itself. Bionic people with synthetic organs and even brains, living buildings and objects that heal themselves will become the norm. Professor Mark Miodownik from UCL will review the changes to the material world that are coming our way.

**Event: 49, Map: 13, Talk, Ages 8+, Pre book email: [slb61@cam.ac.uk](mailto:slb61@cam.ac.uk)**

**5pm – 7pm, Friday 14 March**

**2pm – 4pm, Saturday 15 March**

**Conservation conversations**

**The Fitzwilliam Museum, Trumpington Street, CB2 1RG**

Draw up a chair and meet an object! Items from across the University of Cambridge Museums will be visiting the Fitzwilliam with the people who investigate how they were made and why some of them change over time. See the clues we look for and discuss the decisions we take to help us conserve and preserve the collections.

**Event: 50, Map: 43, Talk, Drop in, Adults**

**5pm – 7pm, Friday 14 March**

**A journey of discovery: Marco Polo. Quaderni Veneziani**

**Hester Adrian Centre, Hawthorn Way, CB4 1AX**

In this filmed monologue the Italian actor Marco Paolini talks about Marco Polo and his relationship with Venice.

**Event: 51, Map: online, Film, All ages,**

**Pre book tel: 01223 31519, email:**

**[ladanteinfo@gmail.com](mailto:ladanteinfo@gmail.com) or visit: <http://ladante-in-cambridge.org>**

**6pm – 7pm, Friday 14 March**

**Genes, brains and psychiatry**

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

Developing new therapies for major psychiatric disorders is one of the greatest challenges facing medicine. Join Professor Michael Owen to discover how advances in neuroscience have given us many new tools to meet this challenge, how recent genetic discoveries provide a new direction for research and also how this work will need to incorporate important conceptual changes to succeed.

**Event: 52, Map: 14, Talk, Ages 15+, Pre book\***

**6pm – 7pm, Friday 14 March**  
**Can science make a cyclist faster?**

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

Cycling leads most Olympic sports in its approach to technology intervention. Professor Tony Purnell is Head of Technology for British Cycling and will provide an overview of how science and engineering contribute to the raw speed of all Olympic cycling disciplines. He will show that it's not just about incremental gains, but also about avoiding incremental losses.

**Event: 53, Map: 30, Talk, Ages 12+, Pre book\***

**6pm – 7.30pm, Friday 14 March**  
**When babies know so much about the physical world, why is school science so difficult?**

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

Modern research shows that long before their first birthday babies understand complex relations involving force and motion. Yet precisely the same relations are so challenging when presented in school science that even high performing undergraduates hold significant misconceptions. Professor Christine Howe will shed light on the conundrum, and draw out implications for parents and teachers.

**Event: 54, Map: 17, Talk, Ages 16+**

**7pm – 8pm, Friday 14 March**  
**Frankenstein 2.0: structure + pattern + movement = life?**

**Department of Chemistry, Lensfield Road, CB2 1EW**

Supported by Society of Chemical Industry and Royal Society of Chemistry

Dr Mark Haw explores our understanding of the processes that define life: the magic that turns inanimate molecules into living systems. The science is potentially world-changing but what are the consequences of updating Mary Shelley's story?

**Event: 55, Map: 13, Talk, Ages 15+**

**8pm – 10pm, Friday 14 March**  
**Music and science: Cambridge Graduate Orchestra concert**

**West Road Concert Hall, West Road, CB3 9DP**

The Cambridge Graduate Orchestra (CGO) will perform a concert of film music featuring Lord of the Rings, Pirates of the Caribbean and Lawrence of Arabia. It will be preceded by a talk given by Ian Cross, Professor of Music and Science in the Faculty of Music.

**Event: 56, Map: 53, Performance/Talk, All ages, Pre book visit:**

**[www.cambridgegraduateorchestra.com](http://www.cambridgegraduateorchestra.com)**



**7.30pm – 8.30pm, Friday 14 March**  
**Talking science: what next?**

**Senate House, CB2 1TN**

Sponsored by TTP Group

There have been massive changes in science and technology since the influential 1985 Bodmer Report. News agencies, government, research institutes and public voices are more actively discussing science and its impact on society. This 20th Cambridge Science Festival special event welcomes Professor Sir Leszek Borysiewicz, Professor Sir Walter Bodmer, Susan Watts and you to talk about what's next.

**Event: 57, Map: 38, Talk, Ages 12+, Pre book\***

**10am – 4pm, Saturday 15, Sunday 16, Saturday 22, Sunday 23 March**  
**Animal structure, pattern and form**  
**Shepreth Wild Life Park, Station Road, Shepreth, Hertfordshire, SG8 6PZ**

Discover patterns and structures at an observational drawing and photography class (11.30am – 12.30pm) using live animal/insect models. See a presentation covering basic animal anatomy, structure, camouflage and mimicry (2.30pm – 3.30pm). Take part in animal related arts and crafts and our 'Round the Park' quiz for 7 – 14 year olds.

**Event: 58, Map: online, Hands on, All ages, Pre book for sessions tel: 01763 262226, email: [education@sheprethwildlifepark.co.uk](mailto:education@sheprethwildlifepark.co.uk), Admission charges apply**

**10.30am – 12.30pm, 2.30pm – 4.30pm, Saturday 15, Saturday 22 March**  
**10.30am – 12.30pm, Monday 17, Wednesday 19, Friday 21 March**  
**Symmetry of science: a walking tour**

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

Join Cambridge Science Guides on a walk which will explore the patterns in nature, from crystals to DNA; from code-breakers to rocks, dinosaurs, plants and insects. The afternoon tour on Saturday 22 March will be in Spanish.

**Event: 59, Map: 50, Tour, All ages, Pre book\***

**Also on this day: Events 2, 5, 6, 7, 15, 16 and 17**

# Science on Saturday starts here!

## Saturday 15 March

It's a big day for science with around 100 events for all ages at venues across the city, from hands on events to talks and demonstrations from students, staff and volunteers from across the University and beyond. Events in this section are listed chronologically by location across our major sites, which include: the Downing Site, the Department of Chemistry, the Guildhall, and across the rest of the city. For an at a glance look at what's on offer on Saturday, check out our guide on the following page. Regular Festival visitors will notice there is minimal activity happening on the New Museums Site, due to building works, so please find our top talks in the Mill Lane Lecture Rooms and events in Biology, Biomedicine and more in the Corn Exchange.

Can't get round everything in one day? Why not come back on Sunday for another chance to attend a selection of explosive science for all ages.

## Highlights

Page 24

### It's rocket science!

Join Professor Chris Bishop at the Department of Chemistry for some spectacular science that sent people to the moon.

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Page 25

### The world's largest balloon Sierpinski tetrahedron

Join Bubbly Maths and the Pyraloons as they make a mathematical Guinness World Record attempt in the Grafton Centre.

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Page 26

### ThinkCon

Something for an older audience and back for 2014, ThinkCon is a day of short talks on everything you could possibly imagine!





0pm	1pm	1.30pm	2pm	2.30pm	3pm	3.30pm	4pm	4.30pm	5pm
61T Stand up maths*		62T Space race*			63T Poking the brain*				
66T Butterfly evolution*		67T Bicycle spokes*			132T In science we trust <sup>#</sup>				
69 – 82H CSF@the Corn Exchange									
84 – 90H CSF@the Guildhall									
91T CHaOS Talks* (recommended ages 8+) & 92H Crash, bang, squelch*									
94H Of bugs and men*									
95E/H Fijian barkcloth unwrapped									
96H From root to shoot									
97H Time truck									
98H Heroic haemoglobin									
99T Skiing									
16E Chiefs and governors									
100H Mind patterns									
101H Maths and the mind									
& 104H Why snot & 105H Kiss of death									
107T Hormones in the womb									
108H Archaeological science									
109T Rolling, bounding, pronking									
111H Animal sounds quiz				112H Life of a dragonfly					
113H Chemisrty in action									
114T It's rocket science <sup>#</sup>				114T It's rocket science <sup>#</sup>					
115H Science of kites*				115H Science of kites*					
116H The mystery of the horrible hypothesis*									
118H Medicines under the microscope									
119H The gamersbus									
121H Engineers Without Borders (recommended ages 8+)									
Sierpinski tetrahedron (recommended ages 5+)									
124T/E The art of scientific imaging									
125H The story of science									
the unknown: a sensory treasure hunt									
122H Nature's patterns									
128T ThinkCon 2014 <sup>#</sup> (various talks until 7.30pm)									
127T How languages are built*			129T Puzzles and Patterns*						
130F A language experience <sup>#</sup>									
131T Matters of life and death									
59GT Symmetry of science*									
152E Wellcome image awards									
6H The plant pattern hunt									
17H/E Perception									
46E Isaac Newton's camera									
50T Conservation conversations									

All ages

8+

12+

16+

Adults

Art vs science\* (p27)

# Top talks@the Mill Lane Lecture Rooms

Mill Lane, CB2 1RW

Map: 30, Talk, Ages 8+, Pre book\* (unless otherwise stated)

## Mill Lane Lecture Room 3

11am – 12noon

### Stuff matters

Concrete that can heal itself, implants that become living bone and liquids that flow upwards. Materials engineer and BBC Science Club presenter Professor Mark Miodownik uses demonstrations to explain why the world is about to become a lot stranger.

Event: 60

12.30pm – 1.30pm

### Stand-up mathematics

Stand-up mathematician Matt Parker takes a hilarious tour through the world of numbers. Returning to the Cambridge Science Festival for another year of engaging and entertaining maths. From Rubik's Cubes to binary numbers, Matt Parker covers his current favourite bits of maths in a comedy show accessible to everyone. Part stand-up and part maths, this show covers a wide range of maths topics in an engaging fashion as seen in sell-out shows at the Edinburgh Fringe Festival, London's West End, the Melbourne Comedy Festival... and the London Mathematical Society.

Event: 61

2pm – 3pm

### Helen Keen's space race

Join Helen Keen for her new, live, spacetacular show for discerning younger space fans. Arrive in your space costume or whip one up out of free tinfoil before the show starts! See how rockets fly! Learn how they stay in orbit! And find out about the intrepid animals who have travelled into space with science comedian Helen Keen.

Event: 62

3.30pm – 4.30pm

### Poking the brain

Steve Mould is well known for pulling pranks on people in BBC 1's Britain's Brightest, all in the name of science. In this show he will explore the mysteries of the brain by messing with your senses. Packed full of demonstrations and audience interaction, you'll find out how tricking your perception of reality can unlock the secrets of the mind.

Event: 63



Mark Miodownik



Matt Parker

STEVE ULLATHORNE



Helen Keen



Steve Mould

IDIL SUKAN/DRAW HQ



## Mill Lane Lecture Room 1

A limited number of tickets will be available on the day for the following talks

10.30am – 11.15am

### Why rodents rule the world

There are over two thousand species of rodent spread across every continent of the world. The group contains many animals familiar to us as pests and pets, including rats and mice, but there are also many less familiar and highly specialised creatures, such as beavers, capybaras, coypus, porcupines and mole-rats. Join Dr Phil Cox to meet the many different rodent species alive today (as well as some unusual extinct forms) and find out why this group of small and unassuming mammals has had such amazing evolutionary success.

Event: 64

11.45am – 12.30pm

### The dark world of caves and the life which lives there

What is life like where there's no light? Can anything live in such conditions? Deep in caves, weird animals do live in such conditions, somehow finding prey and dealing with predators. Apart from bats, these animals are not well known and face some unlikely threats. Join Dr Tony Whitten and play the game of crickets and woodlice.

Event: 65

1pm – 1.45pm

### Why (and how) do butterflies paint their wings?

Butterfly wings are dazzling in their beauty and diversity. Why are they so beautiful? Why are there so many different patterns? Scientists have been asking these questions since Darwin's time. We still don't know the answers completely, but what we do know tells us a lot about the evolution, genetics and lifestyle of butterflies. In this talk, Dr John Davey will show what butterflies can tell us about evolution and explain how genes can work together to paint a butterfly's wings.

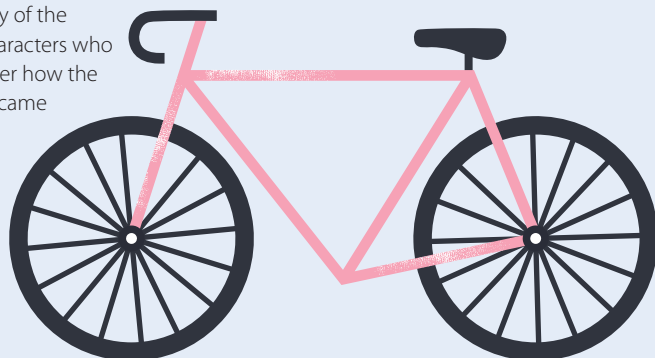
Event: 66

2.30pm – 3.15pm

### How the bicycle got its spokes

With the Tour de France coming to the cycling capital of the UK in 2014, explore the fascinating history of the invention of the bicycle and the colourful characters who made it possible. Join Philip Garsed to discover how the contributions of an eclectic mix of inventors came to make the apparently simple machine we know today.

Event: 67



# CSF@the Corn Exchange



Cambridge Corn Exchange,  
Wheeler Street, CB2 3QB

11 am – 5pm, Saturday (unless otherwise stated)

11 am – 4pm, Sunday (unless otherwise stated)

Map: 6, Hands on, Drop in, All ages (unless otherwise stated)

11am – 1pm

## GetSET

Find out what it is like to study science, engineering or technology at the University of Cambridge. We will be available to help prospective applicants, parents and teachers GetSET for the future.

[www.study.cam.ac.uk/undergraduate](http://www.study.cam.ac.uk/undergraduate)

**Event: 68, Exhibition, Ages 14+**

## Virus wars: antibodies strike back

Viruses are deadly. They kill twice as many people as cancer does. Join scientists from the MRC Laboratory of Molecular Biology and discover how cells are able to use antibodies to detect and destroy viruses. Test your scientific skills in our containment hood speed pipetting game.

**Event: 69**

## 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 Microscope4Schools team. Test your detective skills with our stereomicroscope challenge.

**Event: 70, Ages 8+**

## The wonderful world of blood vessels

If the blood vessels in a human 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 and how they are so well adapted for taking blood around our bodies. See how blood vessels change throughout the animal kingdom, allowing the largest and smallest animals to survive and discover how things can go wrong in disease and what we can do to fix it.

**Event: 71**

## Marvellous metabolism

Every time you swallow a sandwich or bite a banana, your body converts the food you've eaten into the energy you need to do everything – from moving to thinking to keeping warm to growing. Scientists from the University of Cambridge Metabolic Research Laboratories will provide hands on activities and games to help explain why we eat what we do and how we use the energy it provides.

**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? Did you know red cabbage is a great pH indicator? How about making an articulating hand? Some of the great things on offer from the Society of Biology and Hills Road Sixth Form College students.

**Event: 73**

## Discover the double helix

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: 74**

## 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: 75**

## Stem cell discoveries

Come and find out all about the amazing world of stem cells. Look after your own flask of stem cells in our stem cell pet experiment; race to the finish line in our stem cell board game; view some short stem cell films 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.

**Event: 76**

## Don't just be a statistic, be informed

Come and learn how we collect medical data and analyse it using statistics to improve public health. Join the MRC Biostatistics Unit to test your reaction time, see how random you are and weigh up the evidence.

**Event: 77**

## Our immune system decides

Micro-organisms like bacteria are everywhere! Our immune system protects us from harmful invaders, for example by making antibodies. However we rely on beneficial microorganisms living on the surfaces of our bodies. Scientists from the Babraham Institute explain how our immune system responds appropriately and distinguishes from 'good' and 'bad' bacteria and how lifestyle influences this.

**Event: 78**

## Fat, fitness and metabolism...how you can take part in clinical research

Clinical research comes in many forms from cancer drug trials to a simple blood test. At the NIHR/Wellcome Trust Clinical Research Facility within Addenbrooke's Hospital we do exactly this, but we also need healthy adults and children to help us find out about normal body fat, fitness and metabolism. This helps us to understand, recognise and treat metabolic disorders such as diabetes and obesity.

**Event: 79**



## SATURDAY ONLY

### From EPIC Patterns to better health

Looking at patterns in the population allows us to understand the links between diet, lifestyle and health. Help us build Lego® graphs of grip-strength to see patterns in the Science Festival 2014 population! Explore balanced diets on our giant EPIC plate and experience for yourself the eye conditions we've been investigating in the EPIC project in the Department of Public Health and Primary Care.

**Event: 80**

## SATURDAY ONLY (11AM – 3PM)

### Bottle your genes

Students from Long Road Sixth Form College and the Faculty of Education will help you to extract DNA from your own cheek cells. You will be able to see your own DNA – the molecule that makes you who you are – and take it home with you!

**Event: 81**

## SATURDAY ONLY

### Antibody angling: discovery of new medicines using phage display

Join MedImmune scientists and learn how we find new antibody medicines by using viruses which grow only in bacteria. We make huge libraries of these viruses containing DNA coding for antibody proteins displayed on the surface and find those that bind to disease target molecules. Our activity involves building a model of a virus displaying an antibody and showing binding to a 'therapeutic' target.

**Event: 82**

## SUNDAY ONLY

### Making medicines from A to Z

Learn how AstraZeneca scientists discover and develop new medicines. In this interactive experience, explore how chemistry and 3D modelling are used in the design and build of new drugs then explore how these drugs, alone or in combination, are tested in humans to treat diseases such as cancer. As our drug discovery train shows however, the path to success can be complicated.

**Event: 83**



# CSF@the Guildhall

Market Square, CB2 3QJ



Anglia Ruskin  
University

Cambridge & Chelmsford

10am – 4pm (unless otherwise stated)

Map: 44, Hands on, Drop in, All ages (unless otherwise stated)

Presented by Anglia Ruskin University



## Spotted! Ladybird patterns and colours

Britain has more ladybird species than you might imagine, with 47 different types. Many of them are spotted and brightly coloured, whilst others have camouflaged patterns to blend into their surroundings. What is the purpose of the bright colour patterns?

Event: 84

## The mechanics of movement

Using simple technology you will have the chance to record a physical activity such a jump, kick or throw. Then discover how the angles of the joints change in order to optimise the generation of forces and power. Compare your recordings to those of elite athletes across a range of sports.

Event: 85

## Pumping to boarding success

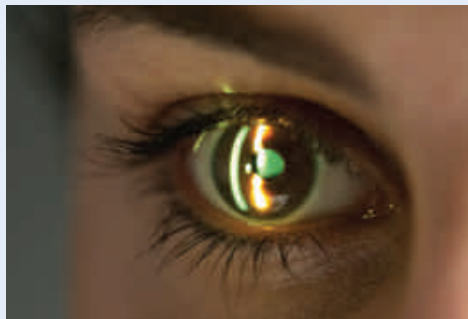
Have a go at one of the tests used with elite sail boarders. Pumping is used to generate speed on the board. We will assess your capability over a 10 second explosive test. You will then have the chance to compare your scores to those of elite sail-boarders.

Event: 86, Ages 8+

## Fooling the brain

This activity will help you think about how the brain uses body representations not just for sensation, but also during social interactions, using a series of illusions.

Event: 87



## The eyes have it

Discover the amazing tricks your brain plays with the eyes by journeying through a gallery of optical illusions. Have a play with the latest computerised equipment used to examine the eye. Discover how good your 3D vision and colour perception is and gain an understanding of what it might be like to have different to normal vision.

Event: 88

## How we use oxygen

A chance to explore how we take up oxygen from atmospheric air for the subsequent generation of energy and how this process is related to exercise intensity and duration. Come and have your expired air recorded and watch how a range of biological systems integrate in order for you to maximise  $O_2$  extraction and  $CO_2$  expulsion.

Event: 89

## Interactive crime scene

Learn all about the science vital in scenes of crime investigation. Collect evidence for analysis and get your hands dirty trying forensic techniques such as finger printing in order to solve the crime.

Event: 90



# CSF@the New Museums Site

Downing Street, CB2 2EJ

9.45am – 4.30pm

## CHaOS talks: more from the makers of Crash, bang, squelch!

Department of Zoology

CHaOS student volunteers are running a series of talks filled with exciting demonstrations!

You'll find more crashes, bangs, and squelches here if you find that our hands-on events are full, or if you want even more CHaOS at the Science Festival! This year we're offering some of our tickets online too!

9.45am – 10.15am

'Sending signals and making messages.'

With Chris Hardy

10.45am – 11.15am

'Crystals: discover their beauty and how we can use them in biology, in the year of crystallography!' With Richard Mifsud

11.45am – 12.15pm

'Feeding the flames: we've used it since we lived in caves, but what does it take to make a fire?' With Will Benfold

1pm – 1.30pm

'Vacuum bazookas and custard fireballs.'

With Dave Ansell of The Naked Scientists

2pm – 2.30pm

'Record breaking plants! We know which animals are the fastest and largest, but how does the plant kingdom measure up?'

With Sonja Dunbar

3pm – 3.30pm

'Parasites: unwelcome visitors in your body.'

With Lia Chappell

4pm – 4.30pm

'Shortcuts to space: what are the best and worst ways to get into orbit?'

With Zephyr Penoyre

For the latest details about each talk, check out our website at

[www.chaossience.org.uk](http://www.chaossience.org.uk)

Event: 91, Map: 16, Talk, Ages 8+, Pre book\* (limited tickets will available on the day)

10am – 5pm

## Crash, bang, squelch!

Department of Zoology

Get to grips with exciting, fascinating and just plain weird experiments that show you how some of the world around us works. Enthusiastic students from the CHaOS Science Roadshow are on hand to show you what's going on in each of our many fun hands on experiments, looking at lots of science that goes crash, bang and squelch!

Event: 92, Map: 16, Hands on, All ages, Pre book\* (limited tickets will available on the day)

10am – 12.30pm

## Total immersion: meet a foreign language in the lab!

Titan Teaching Room 1

Like just about every other member of the human species, you're a fully competent user of at least one language, using it every day to reflect privately, interact publicly, write and record, listen and learn. But how will you cope when immersed in an unknown language? Come along and find out what you can make of a completely unusual language, in a series of computerised tasks which will test your creativity and adaptability to the limit!

Event: 93, Map: 49, Hands on, Drop in, Ages 8+

11am – 12noon, 12noon – 1pm, 1pm – 2pm, 2pm – 3pm, 3pm – 4pm

## Of bugs and men

Department of Zoology

Are we that different from bugs? Come see how real scientists are using the brains, kidneys, and hearing organs of insects to learn more about how the human body works. You will experience the sights and sounds of these organs, and learn how we measure and control their function.

Event: 94, Map: 16, Hands on, Ages 8+, Pre book\*

11am – 4pm

## Fijian barkcloth unwrapped

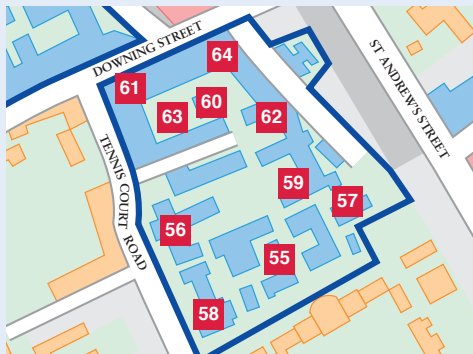
Small Exam Hall, Arts School

For the first time in a generation a large piece of barkcloth from the collection of the Museum of Archaeology and Anthropology will be on display in Cambridge. See the barkcloth and take part in drop in activities to explore the patterns.

Event: 95, Map: 1, Exhibition/Hands on, All ages

# CSF@the Downing Site

Downing Street, CB2 3EQ



For access key see page 50

- |    |  |                 |
|----|--|-----------------|
| 55 | Anatomy Lecture Theatre                        | T, S, Li        |
| 56 | Department of Biochemistry                     | T, Li, S, I, PA |
| 57 | Department of Geography                        | T, S            |
| 58 | Department of Pathology                        | T, S, Li, PA    |
| 59 | Department of Psychology                       | S, Li           |
| 60 | McDonald Institute for Archaeological Research | T, S, PA, I     |
| 61 | Museum of Archaeology and Anthropology         | T, S, Li, I     |
| 62 | Physiology Building                            | T, S, Li        |
| 63 | Plant Sciences Marquee                         | S               |
| 64 | Sedgwick Museum of Earth Sciences              | T, PA, Li       |

10am – 4pm

## From root to shoot: plant patterns past and present

Plant Sciences Marquee

Researchers at the Department of Plant Sciences, the Sainsbury Laboratory and NIAB help you discover the amazing world of plant structure, organisation and pattern formation.

Event: 96, Map: 63, Hands on, Drop in, All ages

10.30am – 3.30pm

## Time Truck at the Sedgwick Museum

Travel in time with Time Truck! Investigate rocks and minerals, discover dinosaurs and explore earthquake science with hands on activities and demonstrations.

Event: 97, Map: 64, Hands on, Drop in, All ages

11am – 3pm

## Heroic haemoglobin

Department of Biochemistry

How does oxygen get around your body? What happens when this process goes wrong or oxygen is in short supply? We will tell you about the amazing protein that is the stuff of life itself.

Event: 98, Map: 56, Hands on, Drop in, Ages 8+

12noon – 12.45pm, 2pm – 2.45pm

## Skiing: understanding human creative power

Museum of Archaeology and Anthropology

The oldest depiction of skiing (in rock carvings from northern Russia) is 5,000 years old. This talk will focus on archaeological and neuroaesthetic interpretations of the rock carvings.

Event: 99, Map: 61, Talk, Ages 12+

10am – 12noon, 2pm – 4pm

## Mind patterns and brain structures

Department of Psychology

Discover how people form memories, what influences gambling behaviour and how the brain develops in adolescence. Learn about research into mental illness or mathematical skills in children.

Research groups at the Department of Psychology showcase their latest research through a series of fun and interactive exhibits and posters.

Event: 100, Map: 59, Hands on, Drop in, Ages 8+

11am – 3pm

## Maths and the mind

Department of Psychology

Construct a form from 2D on paper to 3D in blocks or try your hand at our computer-based games, mental rotation and spatial awareness puzzles... all designed to test and stretch your spatial abilities and discover how these abilities are linked to maths.

Event: 101, Map: 59, Hands on, Ages 5+

10am – 3pm

## The cosmos of your body

Department of Pathology

Did you know your body hosts millions of microbes? Did you know that millions of proteins make your body function? Come to the Department to see the miniature world that is your body.

Event: 102, Map: 58, Exhibition, Drop in, All ages

10am – 3pm

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

Department of Pathology

Science can only be done by people and many (but arguably not enough) are women. Come and talk to Cambridge AWISE about careers in STEM.

Event: 103, Map: 58, Hands on, Drop in, All ages

**10am – 3pm****Why snot?****Department of Pathology**

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

**Event: 104, Map: 58, Hands on, Drop in, All ages****10am – 3pm****Kiss of death: how killer cells fight off viruses****Department of Pathology**

Find out how a serial killer protects you from viral infection. Meet our giant T-cell, watch the killer attack on film and make your own lymphocyte cookie.

**Event: 105, Map: 58, Hands on, Drop in, All ages****11am – 12noon****The captured thought****Anatomy Lecture Theatre**

Words are not the only way in which we capture thoughts. Argentine Tango partners, cognitive neuroscientist Professor Nicky Clayton and artist and writer Clive Wilkins, investigate the notion of what it is like to think without words and consider how close other animals come to doing this.

**Event: 106, Map: 55, Talk, Ages 15+****2pm – 3pm****Do hormones in the womb affect how your brain and mind develops?****Anatomy Lecture Theatre**

Everyone knows that testosterone makes your muscles grow stronger, your voice deepen, and your beard grow. Less well known is that testosterone produced by the baby in the womb has irreversible effects on brain development. This lecture by Professor Simon Baron-Cohen describes a unique experiment conducted on hundreds of Cambridge children, measuring their testosterone in the womb and following them as they grow up, to see how this remarkable molecule affects their brains and minds.

**Event: 107, Map: 55, Talk, Ages 15+****1.30pm – 4pm****Archaeological science****McDonald Institute for Archaeological Research**

Archaeologists are a bit like forensic scientists. Come and learn about the techniques they use to discover the secrets revealed by bones, stones, teeth, hair, shells, pots and even fossilized poo!

**Event: 108, Map: 60, Hands on, Drop in, All ages****3.30pm – 5pm****Rolling, bounding, pronking: how animals move****Physiology Building**

Why do animals move in so many different ways? Surely there is only one way to walk? Dr David Bainbridge will describe how and why animals differ so much in their methods of getting around the place – why a horse decides to trot, canter or gallop; what pangolins have in common with caterpillars; and what astronauts had to learn from cats.

**Event: 109, Map: 62, Talk, Ages 12+****Department of Geography**

By the University of Cambridge Conservation Research Institute

**11am – 1pm****Managing Britain's freshwater invaders**

Dr David Aldridge, lecturer in Aquatic Ecology from Zoology, will be running an interactive table showcasing a selection of invasive species.

**Event: 110, Hands on/Workshop, Drop in, All ages****2pm – 3pm****Wildlife animal sounds quiz**

Sarah Luke, from the Insect Ecology Group in Zoology, will be running an interactive, fun wildlife animal sounds quiz.

**Event: 111, Hands on, Drop in, Ages 8+****3pm – 4pm****The life of a dragonfly**

Did you know that the jaws of the extraterrestrial creature in the film *Alien* were based on those of a dragon fly larvae? Take a look at the dragon fly and other insects under a microscope and learn about their behaviour and function in ecosystems

**Event: 112, Map: 57, Hands on, Drop in, All ages**

# CSF@the Department of Chemistry

Lensfield Road, CB2 1EW

Supported by the Walters Kundert Charitable Trust

Map: 13

A map and full list of activities is available from: [www.openday.ch.cam.ac.uk](http://www.openday.ch.cam.ac.uk) or at the welcome desk outside the Bristol-Myers Squibb Lecture Theatre.



10am – 4.30pm

## Chemistry in action

This year the Department of Chemistry hands on experiments range from exploring the world of perfume to investigating the relationship between chemistry and the exciting properties of magnets. You can also discover how chip fat becomes biodiesel or get involved with slime – it wouldn't be the Science Festival without it! You can also visit the Royal Society of Chemistry stand and find out more about structures and patterns by trying their chemistry and art activities.

**Event: 113, Hands on, Drop in, All ages**

11am – 12noon, 1.30pm – 2.30pm, 4pm – 5pm

**Additional shows 2pm – 3pm, Sunday 16 March, 7pm – 8pm, Monday 17 March**

## It's rocket science!

Join Professor Chris Bishop (Microsoft Research Ltd, Cambridge) for a spectacular family talk packed with demonstrations of the science that sent people to the moon. See the fiery combustion of energetic propellants, and experience the impressive roar and flame of a hybrid rocket engine fired live in the lecture theatre!

**Event: 114, Talk, Ages 7+, Pre book**

**Warning: loud bangs**

**Entry will be by ticket only, which are free and can be booked in advance by telephone:**

**01223 336300, Monday to Friday 9am – 5pm or email: [openday@ch.cam.ac.uk](mailto:openday@ch.cam.ac.uk). Ticket requests made after 4.30pm on Friday 14 March will not be processed. Uncollected tickets will be available on a first come, first served basis 10 minutes before the lecture begins. Please arrive promptly for the lecture.**





# CSF in the city

9.30am – 10.45am, 11am – 12.15pm,  
1pm – 2.15pm, 2.30pm – 3.45pm

## STEM Team East: the science of kites

St Columba Hall, Downing Street, CB2 3DS

Join STEM Team East to explore the science of kites! Learn about aerodynamic forces, how kites helped the discovery of electricity, telecommunications and the design of aircraft. Find out about the forces which govern how kites fly – weight, tension, drag and lift and make your own kite.

Event: 115, Map: 40, Hands on, Ages 8+, Pre book\*

10am – 11am, 10.45am – 11.45am,  
11.30am – 12.30pm, 12.15pm – 1.15pm,  
1pm – 2pm, 1.45pm – 2.45pm,  
2.30pm – 3.30pm, 3.15pm – 4.15pm

## The mystery of the horrible hypothesis

The Pitt Building, Trumpington Street, CB2 1RB

In this exciting activity for all ages, you must use your scientific detective skills to identify the perpetrators and motives behind a fiendish crime. Working with a team of researchers, you will solve a series of devious scientific puzzles from disciplines including psychology, zoology, genetics and forensics. This activity is presented by the Department of Life Sciences at Anglia Ruskin University.

Event: 116, Map: 46, Hands on, Ages 8+, Pre book\*

10am – 12.30pm

## Game change: exploring the design of board games old and new

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

A display of board games from the University Library's collections including examples from the eighteenth and nineteenth centuries. Find out how to win at suffragetto or learn the rules of flick football. There will also be a chance to play some more recent board games.

Event: 117, Map: 10, Exhibition, Drop in, Ages 8+

11am – 4pm

## Medicines under the microscope

Department of Pharmacology,  
Tennis Court Road, CB2 1PD

Fish for daphnia, look at their heart under the microscope and see the effects of common drugs (e.g. caffeine, alcohol and nicotine) on the heart-rate.

Event: 118, Map: 15, Hands on, Drop in, All ages

10am – 4pm

## The gamersbus

Outside Boots, Sidney Street, CB2 3HX

The gamersbus is a mobile gaming theatre in a unique converted double decker bus, offering access to the latest in gaming through unique partnerships with manufacturers, retailers and games publishers.

Event: 119, Map: 22, Hands on, Drop in, All ages

10am – 4pm

## Land yachts

University Centre, Granta Place, Mill Lane, CB2 1RU

Can you harness the power of the wind to drive a model land yacht? Can you design and build a stable yacht that won't fall over? Can you sail it into the wind? Join engineers from the University for a fun-filled hands on activity and find out!

Event: 120, Map: 51, Hands on, Drop in, All ages

10am – 4pm

## Engineers Without Borders

University Centre, Granta Place, Mill Lane, CB2 1RU

Have you ever considered how engineering can break barriers to development? Make your own water filter, explore a rope-washer pump, test out how human energy can power small-scale appliances through a pedal-power bike.

Event: 121, Map: 51, Hands on, Drop in, Ages 8+

10am – 4pm

## Nature's patterns at the Whipple Museum of the History of Science

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

Discover nature's patterns in shells, corals, plants and more. Get up close to skeletons inside and out from the Museum of Zoology and explore the Whipple Museum of the History of Science's amazing collection of historic scientific instruments and teaching models. Guided tours of the Whipple's collection will begin at 11am, 1pm and 3pm.

Event: 122, Map: 54, Hands on, Drop in, All ages

10am – 5pm

## The world's largest balloon Sierpinski tetrahedron

Grafton Shopping Centre, CB1 1PS

A mathematical Guinness World Record attempt by Bubbly Maths and the Pyraloons. Be part of history! Volunteer to build this eight metre fractal with us, join in the workshop for your paper version or take a balloon segment home when you help us tear it down. Judging will take place at 12noon.

Event: 123, Map: 23, Hands on, Drop in, Ages 5+ (Maximum of two under 6's per adult)

10am – 5.30pm

### **A Royal Photographic Society event: the art of scientific imaging** CRUK Cambridge Institute, Li Ka Shing Centre, Robinson Way, CB2 0RE

Join us for a day of talks and exhibition showcasing recent advances in imaging science, from biological and high-speed imaging to optical design and holography. The event includes the CAMPERA OBSCURA, a camera obscura in a camper van!

**Event: 124, Map: 75, Talk/Exhibition, Drop in, All ages**

10.30am – 3.30pm

### **The story of science: family activity day**

**The Polar Museum, Lensfield Road, CB2 1ER**

Once upon a time there was a scientist – well, really an explorer – and actually there were lots of them. They wanted to find out about the North and South Poles, how to get there, what ice was made of and what was at the bottom of the ocean. Join us for a day of science storytelling. Discover the stories throughout the Polar Museum and tell your own. With storyteller, Marion Leeper.

**Event: 125, Map: 47, Hands on, Drop in, All ages**

11am – 12.30pm

### **Terrific temples**

**Museum of Classical Archaeology, Faculty of Classics, Sidgwick Avenue, CB3 9DA**

Join us at the Museum of Classical Archaeology as we become architects for the day. We'll even be taking inspiration from the sculptures in the Museum in building our own terrific temples.

**Event: 126, Map: 34, Hands on, Ages 7 – 11, Pre book tel: 01223 330402, email: [museum-education@classics.cam.ac.uk](mailto:museum-education@classics.cam.ac.uk) or visit: [www.classics.cam.ac.uk/museum](http://www.classics.cam.ac.uk/museum)**

1pm – 2pm

### **How languages are built**

**Keynes Hall, King's College, CB2 1ST**

Have you ever wondered how and why one language differs from another? Professor Ian Roberts, a world-renowned expert on the syntax of Celtic, Romance and Germanic languages, will describe some of the building blocks of language.

**Event: 127, Map: 26, Talk, Ages 12+, Pre book\***

11am – 7.30pm  
**ThinkCon 2014**

**McCrum Lecture Theatre, Corpus Christi College, CB2 1RH**

**Sponsored by Abcam**

ThinkCon is back with a day of speakers for 2014. The venue is once again the McCrum Lecture Theatre, accessed just off the beer garden of the Eagle Pub, where Watson and Crick proclaimed to have discovered the secret of life.

11am – 12noon

**Evolution of Cancer with Kat Arney**

**12noon – 1pm**

**Citizen Science with Hanny van Arkel**

**2pm – 3pm**

**Gia Milinovich chairs a panel session on women in science featuring: Sophie Scott, Helen Czerski and Heather Williams**

**3pm – 4pm**

**Matt Parker**

**4.30pm – 5.30pm**

**Heart physics with Heather Williams**

**5.30pm – 6.30pm**

**Recreational Drugs with Suzi Gage**

**6.30pm – 7.30pm**

**Helen Keen**

**Event: 128, Map: 28, Talk, Ages 12+, Pre book tel: 07980 155167, email: [andy@thinkoutreach.org](mailto:andy@thinkoutreach.org), or visit: <http://thinkoutreach.org>**

2pm – 3pm

### **Puzzles and patterns in language**

**Keynes Hall, King's College, CB2 1ST**

Join us for an interactive workshop to take a look at some puzzling data from a variety of languages. These puzzles, and their proposed solutions, may provide interesting insights into the human capacity of language in general.

**Event: 129, Map: 26, Talk, Ages 12+, Pre book\***

2pm – 4pm

### **A Language Experience: Project Nim**

**Hester Adrian Centre, Hawthorn Way, CB4 1AX**

This film focuses on Project Nim, a research project that was mounted to determine whether a primate raised in close contact with humans could develop a limited language based on American Sign Language.

**Event: 130, Map: online, Film, All ages, Pre book tel: 01223 315191, email: [ladanteinfo@gmail.com](mailto:ladanteinfo@gmail.com), or visit: <http://ladante-in-cambridge.org>**

2.30pm – 4pm

### Matters of life and death

Emmanuel College, Queen's Lecture Theatre,  
St Andrew's Street, CB2 3AP

Rarely are human dilemmas out of the news. What medical science can and ought to do – or not do impinges on everyone. John Wyatt, Professor Emeritus of Ethics and Perinatology at UCL, will examine these issues of life and death against current medical-ethical thought and will explore how healthcare professionals, faith groups and individuals can respond to today's challenges and opportunities.

Event: 131, Map: 19, Talk, Ages 12+

2.30pm – 4.30pm

### In science we trust? Traditional publishing, open access, post-publication review: the future and challenges of modern science communication

Mill Lane Lecture Rooms, Mill Lane, CB2 1RW

Join the debate involving a panel of academics, editors, funders and journalists from across the scientific community as they present their views on what the future of science publishing could be.

Event: 132, Map: 30, Talk, Adults

7pm – 8pm

### Sci Cam: the science magazine show

Cambridge Science Centre, Jesus Lane, CB5 8BQ

Join the students who host the online general science show Sci Cam for a live broadcast 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: 133, Map: 8, Talk, Ages 15+, Pre book\*

7.30pm – 9pm

### New art club: feel about your body

Cambridge Junction, Clifton Way, CB1 7GX

An uplifting, life-affirming and hilarious spectacle about how we feel about our bodies. Tom Roden and Pete Shenton marry stand up comedy with choreographic minimalism. Expect silliness, see a man talking to his bottom and find out what not to do during a heart attack.

Event: 134, Map: 7, Performance, Adults,

Pre book tel: 01223 511 511, email:

[tickets@junction.co.uk](mailto:tickets@junction.co.uk) or visit:

[www.junction.co.uk](http://www.junction.co.uk), £12, £8 concessions



### Robin Ince@the Cambridge Union

Cambridge Union, Bridge street, CB2 1UB

Map: 9, Talk, Ages 14+, Pre book\*

Join comedian and science champion Robin Ince as he curates some lively debates on subjects close to his heart.

5pm – 6pm

### Science and politics

Is there a place for science in politics – can scientists really stay out of politics? In a world where so many political decisions, from environment via education to medicine and beyond, involves science, in a civilisation built on knowledge, how can science communicate effectively with politicians?

Event: 135

7.30pm – 8.30pm

### Art vs science?

No time for two cultures? Which side are you on? Science or art? And isn't that all a load of nonsense? Can't you have both? Join Robin Ince a discussion on the supposed conflict between the two. Is it dead now? Does the mass media still favour art over science despite evidence that the public are quite capable of handling both?

Event: 136

Also on this day: Events 5, 6, 7, 15, 16, 17, 46 and 50

# Science on Sunday

## Sunday 16 March

Join us for a some Sunday science, with another day of family fun and activities for adults too. Owing to the popularity of Saturday, we're hoping this family fun day will grow just as big. Visit us on Sunday for another chance to get hands on in the Corn Exchange and check out a host of demos in the Lady Mitchell Hall.

We're also delighted to welcome back comedian and science champion Robin Ince. He'll be hosting another show and tell which features a plethora of punchy presentations from some of the finest talent across the UK.

Sunday 16 March

## Highlights

Page 29

### **The Simpsons and their mathematical secrets**

Simon Singh will explore how mathematics has been smuggled into some of our favourite TV shows.

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Page 30

### **Robin Ince is (in and) out of his mind**

Robin Ince returns with a look at the last 100 years of psychiatry, psychology and skewiff brain dabbings.

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Page 30

### **The mystery of the horrible hypothesis**

Join a crime scene investigation and use your detective skills to identify the perpetrators and motives behind the fiendish crime.

# Top talks@Lady Mitchell Hall

**Sidgwick Avenue, CB3 9DA**  
**Map: 27, Talk, Ages 8+, Pre book\***  
 A limited number of tickets will be available on the day for the following talks

**11am – 11.45am**

## Generating power

Join David Bebb as he asks what is electricity and where does it come from?

**Event: 137**

**1pm – 1.45pm**

## Demo derby

Join us for the ultimate science off as Cambridge's finest demonstration experts from CHaOS and the Naked Scientists pit themselves against each other! Who will win? You decide!

**Event: 138**

**2.30pm – 3.15pm**

## Sending signals and making messages

This interactive talk with Philip Garsed and Lia Chappell explores technologies that allow people to send messages to each other, including showing how something as complicated as the internet can work with really simple ideas.

**Event: 139**

**3.45pm – 4.30pm**

## Stars, planets and microwave ovens

Join Dominic Ford and Dave Ansell as they use bicycle pumps and kitchen equipment help to find out what a star is made of, how can you detect a planet a hundred light years away and how stars ignite.

**Event: 140**

**10am – 5pm**

## Sunday science

**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 hands on non-stop workshops for all the family. Join us to make and take away some amazing bits of science and engineering. See [www.cambridgesciencecentre.org](http://www.cambridgesciencecentre.org) for more details.

**Event: 142, Map: 8, Hands on, Drop in, All ages, Normal admission charges apply**

**10.30am – 11.30am**

## Science and Buddhism

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

Explore structures and patterns from a Buddhist perspective and how this links to science.

**Event: 142, Map: 5, Talk, Adults**

**11am – 4pm**

## CSF@the Corn Exchange

**Cambridge Corn Exchange, Wheeler Street, CB2 3QB**

Join the CSF@The Corn Exchange for another day of hands on activities for all ages. Please see pages 18 and 19 for all the events taking place.

**Event: 143, Map: 6, Hands on, Drop in, All ages**

**1pm – 2pm**

## The Simpsons and their mathematical secrets

**Cambridge Union, Bridge Street, CB2 1UB**

Simon Singh (author of Fermat's Last Theorem) will talk about his new book, which reveals how a team of mathematically gifted writers have covered everything from calculus to geometry, from pi to

game theory, and from infinitesimals to infinity in various episodes of The Simpsons. He will also discuss how writers of Futurama have similarly made it their mission to smuggle deep mathematical ideas into the series.

**Event: 144, Map: 9, Talk, Ages 8+, Pre book\***



**2.30pm – 4.30pm**

## Robin Ince's show and tell

**Cambridge Union, Bridge Street, CB2 1UB**

From moon rocks to tarantulas, amethysts to ammonites, anything and everything is possible... A totally outrageous open afternoon 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: 145, Map: 9, Demonstration, Drop in, Ages 8+**

**3pm – 4pm**  
**Meet the little things that run the world**

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

In this interactive lecture with Dr Ed Turner we will put insects under the microscope to learn more about their behaviour, natural history and conservation. The session will include some live insects and specimens from the University Museum of Zoology.

**Event: 146, Map: online, Talk, All ages, Pre book email: enquiries@ice.cam.ac.uk**

**4.15pm – 5.15pm**  
**Roman science fiction: structuring imagined worlds**

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

Accounts of trips to the moon and encounters with alien life forms are nothing new. An introduction to the earliest science fiction ever written with Dr Justin Meggitt.

**Event: 147, Map: online, Talk, All ages, Pre book email: enquiries@ice.cam.ac.uk**

**5.30pm – 6.30pm**  
**It's simpler with symmetry**  
**Institute of Continuing Education, Madingley Hall, CB23 8AQ**

What do the palaces of emirs, high tech materials, and broccoli have in common? Find out how symmetry and structure bring together stunning works of art, natural forms, and cutting-edge technology with Dr Erica Bithell.

**Event: 148, Map: online, Talk, Ages 8+, Pre book email: enquiries@ice.cam.ac.uk**

**7.30pm – 10pm**  
**Robin Ince is (in and) out of his mind**

**Cambridge Union, Bridge Street, CB2 1UB**

From Freud and Jung to Laing and Milgram, from rats after rewards to insanity cured by ink spots, Robin looks at the last 100 years of psychiatry, psychology and skewiff brain dabbings. Just how hard is it being a self-conscious being on Planet Earth?

**Event: 149, Map: 9, Talk, Ages 18+, Pre book tel: 01223 357851 or visit: www.cornex.co.uk, £7**

**Also on this day: Events 6, 7, 16, 17, 46, 58 and 114**

**3pm – 4pm, 3.45pm – 4.45pm, 4.30pm – 5.30pm, 5.15pm – 6.15pm**  
**The mystery of the horrible hypothesis at Madingley Hall**

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

Presented by the Department of Life Sciences at Anglia Ruskin University

In this exciting activity for all ages, you must use your scientific detective skills to identify the perpetrators and motives behind a fiendish crime. Working with a team of researchers, you will solve a series of devious scientific puzzles from disciplines including psychology, zoology, genetics and forensics. At the end of the activity, you will synthesise your findings in a final debrief session in which you can win some wonderful prizes!



**Event: 150, Map: online, Hands on, Ages 8+, Pre book\***

**7pm – 10pm**  
**The mystery of the horrible hypothesis: murder mystery dinner**

The ultimate version of this event. Solve the devious mystery over a three-course candle-lit meal.

**Event: 151, Map: online, Hands on, Ages 12+, Pre book email: pe206@cam.ac.uk, £35**

# Throughout the Festival

continued

10am – 4.30pm, Saturday 15, Friday 21 –  
Saturday 22, Monday 24 – Saturday 29 March

10am – 8pm, Monday 17 – Thursday 20 March  
**Wellcome Image Awards 2014  
exhibition**

Ruskin Gallery, Ruskin Building, Anglia Ruskin  
University, East Road, CB1 1PT

The Wellcome Image Awards celebrate creative and captivating images, bringing to life a wealth of scientific and medical discovery. From detailed microscopy and clinical photography to illustration, the Awards are an opportunity to showcase images that capture the wonder of science. There is a Private View on 20 March at 5pm, followed by a talk at 7pm.

**Event: 152, Map: 2, Exhibition, Drop in, All ages**

1pm – 2.15pm (Schools' performance)

5.30pm – 6.45pm, Monday 17 March

**Icarus at the edge of time**

West Road Concert Hall, West Road, CB3 9DP

What if Icarus travelled not to the sun but to a black hole? This orchestral work is a mesmerizing adaptation of Icarus at the Edge of Time by Brian Greene with music by Philip Glass and film by AI + Al. This re-imagining of the Greek myth is performed by Cambridge University Musical Society Symphony Orchestra, conducted by Ben Glassberg and features Gresham Professor of Astronomy Carolin Crawford.

**Event: 153, Map: 53, Performance, Ages 8+,  
Pre book\* for public performance/Pre book for  
schools' performance tel: 01223 768927 or email:  
events@mus.cam.ac.uk**

5.30pm – 6.30pm, Monday 17 March

**'Goodly bound in pleasaunt  
coverture': patterns of bookbinding  
from the 15th to the 18th centuries**

Cambridge University Library, West Road, CB3 9DR

An introduction to early bindings in the Library's collections. The focus will be on patterns of decoration, from simple fifteenth-century blind-tooled bindings and books personalised with coats of arms, to fragile embroidered bindings and extravagant gilt bindings from Restoration and Georgian England.

**Event: 154, Map: 10, Talk, Ages 15+, Pre book\***

6pm – 7pm, Monday 17 March  
**Our Universe and others**  
Centre for Mathematical Sciences,  
Wilberforce Road, CB3 0WA

We are the outcome of a process taking nearly 14 billion years in which atoms, stars, planets and biospheres emerged from a hot dense big bang. Join Martin Rees, Astronomer Royal, as he discusses the key stages in the process. What would our cosmos be like if the key numbers were different? And could a huge variety of other universes exist, each the aftermath of a different big bang?

**Event: 155, Map: 66, Talk, Adults, Pre book visit:  
www.cam.ac.uk/science-festival**

6.30pm – 7.30pm, Monday 17 March  
**Stem cells and repairing brains**

Murray Edwards College, Buckingham House  
Lecture Theatre, Huntingdon Road, CB3 0DF

Join Professor Robin Franklin as he discusses his research into central nervous system regeneration, in particular myelin repair. The potential benefits of myelin repair are to stop nerve cell degeneration and provide a treatment for multiple sclerosis.

**Event: 156, Map: 33, Talk, Adults, Pre book visit:  
www.stemcells.cam.ac.uk/public-  
engagement/science-festival-2014**

7pm – 9.30pm, Monday 17 March  
**CSAR new books evening**

Churchill College, Storey's Way, CB3 0DS

The Cambridge Society for the Application of Research New Books Evening showcases new publications on a range of topics. Speakers will give a short talk on their latest title, followed by questions. There will be a reception with the authors. They include Professors David Spiegelhalter, Haroon Ahmed and Malcolm Longair.

**Event: 157, Map: 12, Talk, Ages 15+, Pre book  
email: csarscr@hermes.cam.ac.uk, £3 suggested  
donation**

6pm – 7.15pm, Tuesday 18 March  
**Cambridge stars: big ideas 2**

Mill Lane Lecture Rooms, Mill Lane, CB2 1RW

Royal Society Fellows are the most eminent scientists, engineers and technologists in the UK and Commonwealth, and Fellowships have been awarded annually since 1660. Six new Cambridge researchers were made Royal Society Fellows in 2013. We welcome immunologist Professor Gillian Griffiths, biochemist Dr Phillip Hawkins and computer scientist Professor Jon Crowcroft to the Festival to introduce us to their research.

**Event: 158, Map: 30, Talk, Ages 12+, Pre book\***

Also on this day: Events 2, 5, 6, 7, 46, 59, 114 and 152

**6.30pm – 7.30pm, Tuesday 18 March**  
**Stem cells: using physics and engineering principles in research**

Murray Edwards College, Buckingham House  
 Lecture Theatre, Huntingdon Road, CB3 0DF

Dr Kevin Chalut's lab focuses on new ways to investigate physical states of a cell during its development using microscopy and microfluidic techniques. The goal is to discover the physical mechanisms, and the importance of those mechanisms, in various areas of stem cell research.

**Event: 159, Map: 33, Talk, Adults, Pre book visit:**  
[www.stemcells.cam.ac.uk/public-engagement/science-festival-2014](http://www.stemcells.cam.ac.uk/public-engagement/science-festival-2014)

**7pm – 8pm, Tuesday 18 March**  
**The limitations to human oxygen consumption: is it structural or metabolic?**

Anglia Ruskin University, East Road, CB1 1PT

This interactive lecture by Dr Dan Gordon will explore how we use oxygen to do work and consider whether the limitations to human endurance lies at a structural or metabolic level.

**Event: 160, Map: 2, Talk, Adults, Pre book tel:**  
 0845 196 5060, email: [miriam.berg@anglia.ac.uk](mailto:miriam.berg@anglia.ac.uk),  
 or visit: [www.anglia.ac.uk/communityevents](http://www.anglia.ac.uk/communityevents)

**7pm – 8.45pm, Tuesday 18 March (includes introductory talk)**

**8pm – 8.45pm, Thursday 20 March**  
**The Golden Window**

Ruskin Gallery, Ruskin Building, Anglia Ruskin University, East Road, CB1 1PT

A film and exhibition exploring the state of human suspension that allows lifesaving – medical intervention.

**Event: 161, Map: 2, Exhibition/Film, Ages 12+**

**8pm – 9pm, Tuesday 18 March**  
**Transmissible cancers in dogs and Tasmanian devils**

Mill Lane Lecture Rooms, Mill Lane, CB2 1RW

Join Andrea Strakova for a talk which will reveal unexpected findings about two unique cancers which have adapted to transfer by the means of living cancer cells between their hosts – Tasmanian devils and domestic dogs. We will explore how a cancer can become transmissible, despite the fact that it is usually considered to be a malignant transformation of cells of your own body.

**Event: 162, Map: 30, Talk, Ages 12+, Pre book\***



Science of SWEEETS!

**11am – 1pm, Wednesday 19 March**  
**Patterns in plants**

Botanic Garden, Brookside, CB2 1JE

Recognising patterns is a key part of plant identification. Discover more about plant collecting and classification through a tour of the University Herbarium and the systematic beds, and learn how to make a herbarium sheet.

**Event: 163, Map: 4, Tour, Adults, Pre book\***

**1.15pm – 2pm, Wednesday 19 March**  
**Beyond the page: shedding (infrared) light on manuscript illuminations**

The Fitzwilliam Museum, Seminar Room, Trumpington Street, CB2 1RG

Beyond the page: shedding (infrared) light on manuscript illuminations by Paola Ricciardi, Research Associate, Manuscripts and Printed Books.

**Event: 164, Map: 43, Talk, Adults, admission is by token, available from the Courtyard entrance desk from 12.45pm on the day**

**4pm – 5pm, Wednesday 19 March**  
**When scientists fly: the Arctic science experience**

The Polar Museum, Lensfield Road, CB2 1ER

Have you ever wondered what a scientist does? What a researcher gets up to? Join our mission to map the Arctic atmosphere. Climb aboard and take control of our replica aircraft. Meet the experts, become a scientist and analyse data in the Arctic skies.

**Event: 165, Map: 47, Hands on, Ages 12 – 18, Pre book visit: [www.cam.ac.uk/science-festival](http://www.cam.ac.uk/science-festival)**

**4.30pm – 5.30pm, Wednesday 19 March**  
**The science of SWEEETS!**

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

Stefan Gates (BBC's Gastronomer) and Dr Sella (UCL's Chem-onaut) blow your minds (and quite possibly your house) with an explosive and bizarre journey into sweet science. They'll be tearing apart sweet chemistry, spinning sugar and playing with some amazing colours, whilst attempting to make lollies, jellies and various chewy things for you live on stage.

**Event: 166, Map: 27, Talk, Ages 8+, Pre book\***

Also on this day: Events 2, 5, 6, 7, 15, 16, 17 and 152



**5.30pm – 6.30pm, Wednesday 19 March**  
**Emprynted in thys maner: book design and book production in the 15th and 16th centuries**

**Cambridge University Library, West Road, CB3 9DR**

View and discuss some of the Library's earliest printed books with curators from the Rare Books Department, Dr Laura Nuvoloni and Ed Potten. To the modern eye early printed books can be bewildering, but their make-up and appearance are far from accidental.

**Event: 167, Map: 10, Talk, Ages 15+, Pre book\***

**6pm – 7pm, Wednesday 19 March**  
**Making machines see**

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

Computer vision is the science and technology of making machines that see. Join Professor Roberto Cipolla to find out about the theory, design and implementation of algorithms that can automatically process visual data to recognise objects, track and recover their shape and their spatial layout.

**Event: 168, Map: 30, Talk, Ages 12+, Pre book\***

**6pm – 7.30pm, Wednesday 19 March**  
**Out of this world: the Arctic science experience**

**The Polar Museum, Lensfield Road, CB2 1ER**

Enjoy a glass of wine and join our mission to map the Arctic atmosphere. Get the chance to take on the role of a polar scientist and analyse data on board our replica aircraft. Learn from the experts; members of the Methane in the Arctic: Measurements and Modelling (MAMM) project will be with us to explain their roles and take us on our campaign through the Arctic skies.

**Event: 169, Map: 47, Hands on, Ages 18+, Pre book visit: [www.cam.ac.uk/science-festival](http://www.cam.ac.uk/science-festival)**

**6.30pm – 7.30pm, Wednesday 19 March**  
**Healthy for longer: guess how and guess who?**

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

Join colleagues from the Department of Public Health and Primary Care for a life size game of guess who? to understand epidemiological concepts and how, by discovering patterns in populations, we can advise the people on how to stay healthy for longer.

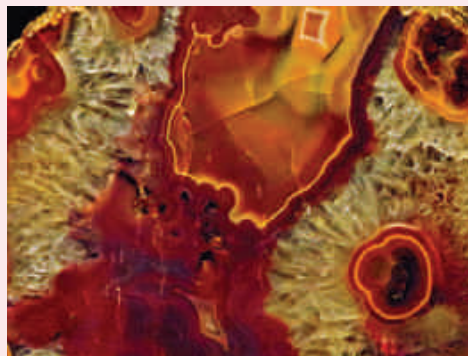
**Event: 170, Map: 30, Talk, Ages 15+, Pre book\***

**6.30pm – 7.30pm, Wednesday 19 March**  
**Stem cells: what can stem cells do for Parkinson's Disease?**

**Murray Edwards College, Buntingford House Lecture Theatre, Huntingdon Road, CB3 0DF**

Professor Roger Barker's lab studies chronic neurodegenerative disorders of the nervous system, in particular Parkinson's and Huntington's disease. Join us to understand more about how these diseases develop. By testing new therapies with specific patient subgroups, the ultimate aim is to find therapies to stop or modify disease processes.

**Event: 171, Map: 33, Talk, Adults, Pre book visit: [www.stemcells.cam.ac.uk/public-engagement/science-festival-2014](http://www.stemcells.cam.ac.uk/public-engagement/science-festival-2014)**



DUN\_DEAGH

**7pm – 8pm, Wednesday 19 March**  
**Painting with the Earth**

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

Dr Spike Bucklow of the Hamilton Kerr Institute talks about natural mineral pigments used in painting over the millennia.

**Event: 172, Map: 64, Talk, Ages 15+, Pre book\***

**7pm – 8.30pm, Wednesday 19 March**  
**DNA, diseases and dilemmas: debating the use of bacterial genome data in healthcare**

**Emmanuel College, Queen's Building Theatre, St Andrew's Street, CB2 3AP**

What are the ethical issues in using DNA sequencing to fight infectious diseases such as HIV, tuberculosis and hepatitis? How can genetic information be used to track the spread of infection, identify drug resistance and determine treatments? We will discuss the challenges of hospitals using this information through relating stories of patients with these infections. Join the debate and share your views in this event led by Professor Sharon Peacock.

**Event: 173, Map: 19, Talk, Ages 15+, Pre book tel: 01223 496995, email: [pubengage@sanger.ac.uk](mailto:pubengage@sanger.ac.uk), or visit: [www.cam.ac.uk/science-festival](http://www.cam.ac.uk/science-festival)**

**Also on this day: Events 2, 5, 6, 7, 15, 16, 17, 59 and 152**

7.30pm – 10pm, Wednesday 19 March

**Double bill: Volcano /  
A Journey Round My Skull****Cambridge Junction, Clifton Way, CB1 7GX**

Volcano is about eruptions and emotions, volcanoes and the Righteous Brothers, tension and release. It is funny and it is deadly serious. A Journey Round My Skull is inspired by the extraordinary medical memoir written by Hungarian satirist Frigyes Karinthy.

**Event: 174, Map: 7, Performance, Ages 14+,****Pre book tel: 01223 511511, email:****tickets@junction.co.uk, or visit:****www.junction.co.uk**

8pm – 9pm, Wednesday 19 March

**Sustainable cities in an  
uncertain future****Mill Lane Lecture Rooms, Mill Lane, CB2 1RW**

Organised by Cambridge Forum for Sustainability and the Environment, Energy@Cambridge and CSaP

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. Can we rethink how we design and live in cities? What will the impact of increasing numbers of people living in cities be on society, or biodiversity, or on food, water and energy security? A panel of distinguished speakers will focus on some of these most pressing challenges faced by our cities.

**Event: 175, Map: 30, Talk, Ages 12+, Pre book\***

8pm – 9pm, Wednesday 19 March

**Is monogamy dead?****CB2 Bistro, Norfolk Street, CB1 2LD**

Disgruntled serial monogamist Rosie Wilby presents a sequel to her Cambridge Science Festival sell out show The Science of Sex, after making a pact with her best friend that they are going to become 'sex sirens' in their early 40s – whatever that means.

**Event: 176, Map: 11, Hands on, Drop In, Adults,****Pre book tel: 07889 176050 or visit:****www.cam.ac.uk/science-festival, £5**

9.30am – 10.45am, 11am – 12.15pm, Thursday

20, Friday 21 March

**Science of sport for schools****University of Cambridge Sports Centre,****Charles Babbage Road, CB3 0FS**

Test your strength, fitness and agility using our interactive challenges. Have you got quicker reaction times than your teacher? Other activities include Batak Wall, target practice, vertical jumps and a speed test.

**Event: 177, Map: 73, Hands on, Ages 12 – 16,****Pre book tel: 01223 336997, email:****bookings@sport.cam.ac.uk, or visit:****www.sport.cam.ac.uk**

4pm – 8pm, Thursday 20 March

**What makes a family? Parents  
and family development in the  
21st century****Downing College, Regent Street, CB2 1DQ**

Who can become parents and how families are formed has changed greatly in the last 30 years.

During this family friendly session we'll be discussing new research looking at families helped by assistive reproduction technologies (ARTs), same-sex parenting and single parent families, as well as the role of the family in child development.

**Event: 178, Map: 18, Hands on/Talk, All ages,****Pre book tel: 01223 767807 or email:****infancy@hermes.cam.ac.uk**

5.30pm – 6.30pm, 20 Thursday March

**Annual Disability Lecture:  
mentally healthy environments****St John's College, Fisher Building,****Palmerston Room, St John's Street, CB2 1TP**

Clinical psychologist Dr Rachel Perkins will speak about creating mentally healthy environments. She develops and influences the development of mental health services nationally and internationally and her work has had significant impact on the lives of service users returning to work.

**Event: 179, Map: 41, Talk, Ages 12+, Pre book visit:****www.training.cam.ac.uk/cppd/event/1059959**

5.30pm – 6.30pm, Thursday 20 March

**Powerful patterns****Museum of Archaeology and Anthropology,****Downing Street, CB2 3DZ**

Based on artefacts in MAA's collection (many of which are on display in the Chiefs and Governors exhibition), this talk by Dr Lucie Carreau gives an overview of the motifs adorning Fijian objects and explores the ways in which decorative patterns can help make objects powerful and efficacious.

**Event: 180, Map: 61, Talk, Ages 15+, Pre book****email: sarah-jane.harknett@maa.cam.ac.uk**

**6pm – 7pm, Thursday 20 March**  
**A festival piece of Raspberry Pi**

Mill Lane Lecture Rooms, Mill Lane, CB2 1RW

Supported by Cambridge University Press

The Raspberry Pi foundation is on a mission to get young people back into computing. Find out about the history of the Raspberry Pi from its inception at the University of Cambridge's Computer Laboratory to the amazing projects being undertaken throughout the world today.

**Event: 181, Map: 30, Talk, Ages 8+, Pre book\***

**6pm – 7.30pm, Thursday 20 March**  
**The art and science of curation**

The Polar Museum, Lensfield Road, CB2 1ER

Presented by University of Cambridge Museums

Curation is at the heart of what makes museums, yet it means different things to different people. Join a panel of curators as they explore the definition of curation and their role across the arts and sciences.

**Event: 182, Map: 47, Talk, Ages 15+, Pre book\***

**6.30pm – 7.30pm, Thursday 20 March**  
**Stem cells: reprogramming adult cells back into embryonic stem cells**

Murray Edwards College, Buckingham House Lecture Theatre, Huntingdon Road, CB3 0DF

Dr Jose Silva studies the biology of how to convert a somatic cell back into a pluripotent cell. Somatic cells make up our internal organs, skin, bones, blood and connective tissue. A pluripotent cell refers to a stem cell that has the potential to differentiate into any of the three germ layers. Learn more about this fascinating process.

**Event: 183, Map: 33, Talk, Adults, Pre book visit:**  
[www.stemcells.cam.ac.uk/public-engagement/science-festival-2014](http://www.stemcells.cam.ac.uk/public-engagement/science-festival-2014)

**7pm – 8.30pm, Thursday 20 March**  
**Science as the spark:**  
**Literature inspired by science**

Anglia Ruskin University, East Road, CB1 1PT

How has scientific inquiry lead to literary works? Why is the literary presentation of science relevant to scientists and to society? This panel, chaired by Dr John Holmes, will skirt the cliches to ask illuminating questions, investigating why a number of talented scientists, historians and artists structure their work at the intersection of these worlds.

**Event: 184, Map: 2, Talk, Adults, Pre book tel:**  
 0845 196 5060, email: [miriam.berg@anglia.ac.uk](mailto:miriam.berg@anglia.ac.uk),  
 or visit: [www.anglia.ac.uk/communityevents](http://www.anglia.ac.uk/communityevents)

**7pm – 8pm, Thursday 20 March**  
**SciBar: can we live without rhythm?**

Arts Picturehouse Bar, St Andrews Street, CB2 3AR

Our bodies are connected with sound in complex ways, both with the sounds we make and with those that others make. Science paints a fascinating picture of the patterns and structures of human social and cultural rhythm, with research from kinesics, anthropology, music psychology, and neuroscience. With Dr Satinder P Gill.

**Event: 185, Map: 3, Talk, Adults, Pre book email:**  
[info@britishscienceassociation-cambridgeshire.org.uk](mailto:info@britishscienceassociation-cambridgeshire.org.uk), visit: [www.cam.ac.uk/science-festival](http://www.cam.ac.uk/science-festival)

**7pm – 9pm, Thursday 20 March**  
**Touchy feely**

Cambridge Science Centre, Jesus Lane, CB5 8BQ

Supported by the Wellcome Trust

Adults! Get hands on and discover the science behind how we feel and touch our way through the world. Find out which body part has the most touch nerves, how your touch and temperature sensing nerves can get tired and much more.

**Event: 186, Map: 8, Hands on, Adults,**  
**Pre book tel: 01223 967965, email:**  
[info@cambridgesciencecentre.org](mailto:info@cambridgesciencecentre.org), or visit:  
[www.cambridgesciencecentre.org/whats-on/events/TouchyFeely20march](http://www.cambridgesciencecentre.org/whats-on/events/TouchyFeely20march)

**7.30pm – 10pm, Thursday 20 March**  
**Bright Club**

The Portland Arms, Chesterton Road, CB4 3BA

The thinking person's variety night. Join our special guests on stage alongside researchers giving stand-up comedy a go for the first time. Join academics from Cambridge and beyond for a lighthearted look at their research.

**Event: 187, Map: 48, Performance, Adults,**  
**Pre book tel: 07980 155167, email:**  
[andy@thinkoutreach.org](mailto:andy@thinkoutreach.org), or visit:  
<http://cambridge.brightclub.org>, £8



GAETAN LEE

Also on this day: Events 2, 5, 6, 7, 15, 16, 17, 36, 152 and 161

**7.30pm – 8.30pm, Thursday 20 March**  
**Why we know very little about the effect of diet on health. And why so much is written about it**

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

David Colquhoun, Professor of Pharmacology and author of the award winning Improbable Science Blog (<http://www.dcsience.net/>) debunks some of the many myths involving diet and ill health, with which we are endlessly bombarded.

**Event: 188, Map: 30, Talk, Ages 15+, Pre book\***

**5.30pm – 6.30pm, Friday 21 March**  
**Mind over matter**

**McCrum Lecture Theatre, Corpus Christi College, CB2 1RH**

Twelve of Britain's oldest brain donors agreed to be photographed and interviewed about their involvement in brain research and the search for cures for dementia. Presented by artist Ania Dabrowska and Professor Bronwyn Parry, King's College London. Panel discussion chaired by Professor Carol Brayne.

**Event: 189, Map: 28, Talk, Ages 15+, Pre book tel: 01223 330304, email: ll448@medschl.cam.ac.uk or visit: [www.mindovermatterproject.co.uk](http://www.mindovermatterproject.co.uk)**

**6pm – 7pm, Friday 21 March**  
**Why are all snowflakes hexagons: the secret life of water**

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

All snowflakes that fall from the sky are hexagonal. Why? The answer lies in the molecular arrangement of water in ice crystals. But what exactly is a crystal? We will discover the secret molecular symmetries using X-rays to probe deep into crystals. Dr Michael Wharmby shows that with clever tricks, not all snowflakes are hexagons!

**Event: 190, Map: 30, Talk, Ages 12+, Pre book \***



YELLOWCLOUD

**Also on this day: Events 2, 5, 6, 7, 15, 16, 17, 48, 59, 152 & 177**

**6pm – 7pm, Friday 21 March**  
**The early history of the Cavendish Laboratory**

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

**Supported by Cambridge University Press**

The opening of the Laboratory in 1874 marked the beginning of a remarkable period of growth in experimental physics in Cambridge. Up to that date, there were no experimental facilities for physics and the subject was not an approved discipline in the Natural Sciences Tripos. The tortuous events which led to the foundation of the Laboratory and the remarkable achievements of the first three Cavendish Professors, Maxwell, Rayleigh and JJ Thomson, will be described by Professor Malcolm Longair.

**Event: 191, Map: 30, Talk, Ages 12+, Pre book\***

**7.30pm – 9.30pm, Friday 21 March**  
**Scientific wine tasting**

**Todd-Hamied Room, Department of Chemistry, Lensfield Road, CB2 1EW**

Luke Webster will describe how the flavour and aroma volatiles of wine are created. How we get from grape juice, which has a comparatively small range of compounds that we can smell, to the rich, structured flavours in the finished product. His talk will be illustrated and exemplified with several interesting wines.

**Event: 192, Map: 13, Talk, Adults, Pre book email: [john.otoole9@btopenworld.com](mailto:john.otoole9@btopenworld.com)**

**8pm – 9pm, Friday 21 March**  
**What's the point of palaeontology?**

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

Join zoologist Nick Crumpton and a panel of palaeontologists to learn how palaeontology has developed into a cornerstone of biology: important not only for increasing our understanding of the past but also helping decipher the world today. From teasing apart evolution to learning how animals react to climate change, find out what place vertebrate palaeobiology has in the 21st century.

**Event: 193, Map: 30, Talk, Ages 15+, Pre book\***

**7pm – 9pm, Tuesday 25 March**  
**Skeptics in the pub: Will Moy**

**The Maypole Pub, Portugal Place, CB5 8AF**

Will Moy runs Full Fact, the UK's only independent fact checking organisation. He'll be talking about what happens when politicians and journalists misuse facts, why it matters, and what we can do to check facts better.

**Event: 194, Map: 45, Talk, Adults, Suggested donation £3**

# CSF@West Cambridge

**Saturday 22 March**

Join us on the West Cambridge Site for a day full of magnificent manufacturing, phenomenal physics, marvellous maths and more and we're hoping for great weather so we can all take part in some awesome astronomical star gazing.

**Saturday 22 March**

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For access key see page 50

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|--|-------------|
| 65 Cavendish Laboratory                            | T, S, Li, I |
| 66 Centre for Mathematical Sciences                | T, S, Li, I |
| 67 Department of Materials Sciences and Metallurgy | T, S, Li, I |
| 68 Geological Conservation Unit                    | PA          |
| 69 Hauser Forum                                    | T, S, Li    |
| 70 Institute of Astronomy                          | T, PA       |
| 71 Institute for Manufacturing                     | S, PA       |
| 72 Isaac Newton Institute of Mathematical Sciences | T, S, Li, I |
| 73 University of Cambridge Sports Centre           | T, S, Li    |

## Highlights

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### Schools zone

Teams of students from schools across the region come to the Festival and showcase their skills as the next generation of scientists.

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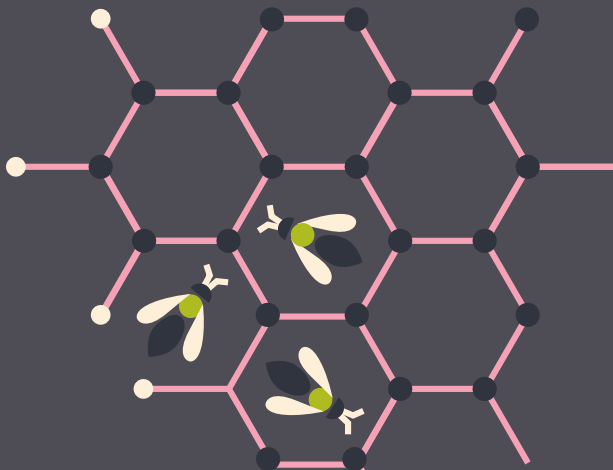
### The gamersbus

Come on board a double decker bus, converted into a mobile gaming theatre with access to all the latest gaming.

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### CSF@IfM

The Institute for Manufacturing welcomes you to a host of FantasTech events at their open afternoon.



11am – 3pm

**Schools zone****Hauser Forum, Charles Babbage Road, CB3 0GT****Sponsored by Blue Bridge Education**

Teams of students from schools and sixth form colleges are the experts, 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 as they bring interactive fun to the Festival.

**Event: 195, Map: 69, Hands on, Drop in, All ages**

12noon – 1pm, 2.30pm – 3.30pm

**Minerals, fossils and meteorites are more fragile than you think****Geological Conservation Unit, AG Brighton Building, Madingley Rise, CB3 0EZ**

A geological conservation event which combines a 30 minute workshop with a 30 minute tour of the geological store facility. Although most minerals, fossils and meteorites are rock-hard, their preparation and conservation for the purposes of research and museum display requires careful handling and considerable skill. Find out from the experts the do's and don't's of specimen preparation and conservation.

**Event: 196, Map: 68, Tour, Ages 15+, Pre book\***

11am – 12noon

**Steel: probably the best material in the world****Department of Materials Science and Metallurgy, Goldsmiths' Lecture Room, 23 Charles Babbage Road, CB3 0FS**

Find out more about probably the most important material ever used – steel. Almost every man-made object in the world is either made from steel or has been made using it. This talk explores what makes steel such a special material, the history of its use, and how it continues to be developed.

**Event: 197, Map: 67, Talk, Ages 12+**

12.30pm – 1.30pm

**Artificial muscles****Department of Materials Science and Metallurgy, Goldsmiths' Lecture Room, 23 Charles Babbage Road, CB3 0FS**

This talk demonstrates various materials that are being used to develop artificial muscles.

**Event: 198, Map: 67, Talk, Ages 12+**

1pm – 5pm

**The gamersbus****Hauser Forum, Charles Babbage Road, CB3 0GT**

The gamersbus is a mobile gaming theatre in a converted double decker bus, offering access to the latest in gaming through unique partnerships with manufacturers, retailers and games publishers. It offers social gaming experiences for events, and private hire and for social engagement and education purposes to schools and communities.

**Event: 199, Map: 69, Hands on, Drop in, All ages**

2.30pm – 6.30pm

**Open afternoon at the Institute of Astronomy****Institute of Astronomy, Madingley Road, CB3 0HA**

The Institute of Astronomy opens its doors for our annual open afternoon. We will have talks, displays, demonstrations and hands on activities for everyone to learn more about astronomy, and the kind of research we do.

**Event: 200, Map: 70, Hands on/Exhibition, Drop in, Ages 8+**

7pm – 9pm

**Public observing at the Institute of Astronomy****Institute of Astronomy, Madingley Road, CB3 0HA**

Stargazing on the Observatory lawns. If (and only if!) the weather is clear, we will run public observing using both modern and historical telescopes on the Observatory lawns. If it is cloudy, the event will not go ahead.

**Event: 201, Map: 70, Hands on/Exhibition, Drop in, Ages 8+**

# CSF@the Centre for Mathematical Sciences

Wilberforce Road, CB3 0WA



11.30am – 4pm

## Hands on maths fair

Centre for Mathematical Sciences

Famously, GH Hardy described mathematicians, like poets and painters, as makers of patterns, and mathematics as a creative art. Find out what patterns you can discover, and explore your creative thinking and critical reasoning, with hands on activities, games and problem solving challenges for all ages from five to adult. From prime number hopscotch to origami, it's maths, but not as you may know it!

Event: 202, Map: 66, Hands on, Drop in, Ages 5+



12noon – 1pm

## Seven things you need to know about prime numbers

Centre for Mathematical Sciences

Prime numbers are fundamentally important in mathematics. Join Dr Vicky Neale to discover some of the beautiful properties of prime numbers, and learn about some of the unsolved problems that mathematicians are working on today.

Event: 203, Map: 66, Talk, Ages 15+

3pm – 4pm

## Mathematical patterns in animal markings

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

Professor Ian Stewart will talk about how Turing equations can be used to describe chemical processes that biologists study to understand the process of pattern formation in animal markings.

Event: 204, Map: 72, Talk, Ages 15+, Pre book visit: [www.cam.ac.uk/science-festival](http://www.cam.ac.uk/science-festival)



# CSF@the Cavendish Laboratory

JJ Thompson Avenue, CB3 0HE

1pm – 5pm

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

## Hands on physics

Participate in popular demonstrations of physics in action. Experience a new range of earth shaking events and make and try science toy to take home. Past festival favourites will also return – test the strength of a vacuum in a tug of war, fly an egg and see many new scientific surprises.

Event: 205

## Experiments, demonstrations and CHaOS

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

Event: 206

## Astronomy road show planetarium

Sponsored by the East Anglia Branch of the Institute of Physics

Explore the beauty of the night sky. Learn about space, stars and the solar system. The shows are interactive, lively, up-to-date via the internet and scientifically accurate.

Event: 207



## Physics IS fun talks

Event: 208, Pre book\*

Small lecture theatre

1.45pm – 2.15pm

'Tripping the light fantastic'

With Dave Ansell

Ages 8+

2.45pm – 3.15pm

'Tripping the light fantastic'

With Dave Ansell

Ages 8+

3.45pm – 4.15pm

'Developing medical physics in Ghana'

With Ewa Karczewska and Marta Caballero

Ages 12+

Pippard Lecture Theatre

1pm – 1.45pm

'Structures and patterns: how quantum' mechanics drives our world'

With Dr Mete Atature

Ages 12+

2.30pm – 3pm

'Physics you meet every day: especially in toys'

With Dr Lisa Jardine-Wright

Ages 12+

3.45pm – 4.15pm

'Vacuum bazookas and custard fireballs'

With Dave Ansell

Ages 8+



# CSF@the Institute for Manufacturing

Charles Babbage Road, CB3 0FS

1pm – 5pm

Map: 71, Hands on, Drop in, All ages (unless otherwise stated)

## 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. Witness lasers cutting through metals up to 30mm thick. Have your name laser engraved onto the head of a live match and try to use a laser to ignite gun cotton... it goes off with a BANG!

Event: 209, Tour, Ages 8+



## Laser rocket racing

Fire lasers at mini rockets and make them speed along a wire track. Race your friends and family and see who has the best aim!

Event: 210, Ages 8+

## Inkcredible!

Our in-house inkjet experts will show you how they can slow down the world with their ultra high speed technology, and how their liquid jet research reveals some monstrous findings!

Event: 211

## FantasTech!

Enjoy a host of activities from our photonics experts, including creating your very own laser etched metal id card. You will also see a thermal imaging camera in action: use your finger to write on the wall with just your own heat or see your hot spots!

Event: 212

## Laser bunny hop

Hop, skip and jump as best you can to avoid setting off the alarm on the criss-cross track of lasers. Complete the course to win a prize!

Event: 213

## Sustainable science

Fun and interactive lessons from our experts in industrial sustainability.

Event: 214, Ages 8+

## 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: 215

## Raspberry Pi at the IfM

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

Event: 216

1.15pm – 2pm, 3.15pm – 4pm

## It's not science fiction: it's just engineering!

Printable food? Bendable computers? Flying drones delivering your shopping? Electric racing cars? Every day, engineers take incredible ideas and make them work in the real world. This talk will show you some amazing ideas being developed in Cambridge and elsewhere, and introduce you to some of the extraordinary young engineers working to make these ideas a reality.

Event: 217, Talk, Ages 8+, Pre book\*

2pm – 4.30pm

## Pecha Kucha challenge

Graduate students enrolled for a PhD in engineering will take on the challenge of sharing their research with you in just 6min 40 sec, using the Pecha Kucha presentation method of 20 slides each lasting 20 sec. Will they succeed?

Event: 218, Ages 12+



# CSF in the city

10am – 5pm

## Amazing animals: crafty camouflage and communication

Cambridge Science Centre, Jesus Lane, CB5 8BQ

How good are you at spotting a copycat? The Zoology Museum will be running workshops and activities at the Cambridge Science Centre, exploring animal senses, camouflage and mimicry.

**Event: 219, Map: 8, Hands on, Drop in, All ages,**

**Pre book tel: 01223 967965, email:**

**info@cambridgesciencecentre.org, or visit:**

**www.cambridgesciencecentre.org, Normal admission charges apply**



10.30am – 12noon, 1pm – 2.30pm, 3pm – 4.30pm

## A chemical trail around Cambridge University Botanic Garden

Botanic Garden, Brookside, CB2 1JE

Plants contain many interesting chemical compounds, some of which have made them useful to us as medicines, foodstuffs, dyes etc. This guided walk will highlight some of these plants, from the Botanic Garden's Chemicals from Plants Trail.

**Event: 220, Map: 4, Tour, Ages 15+, Pre book\*, Standard admission charges for adults, accompanied children free**

10.30am – 12.30pm

## Rocks make pictures

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

Make and take away your own mineral picture using natural mineral pigments, just as our ancestors did thousands of years ago. Learn about the minerals which have provided artists with these pigments for millennia.

**Event: 221, Map: 64, Hands on, Drop in, Ages 8+**

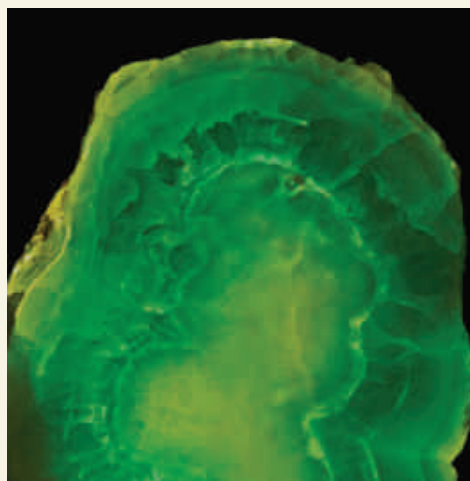
10.30am – 3.30pm

## What on earth is it? Antique rock show

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

Bring along your geological specimens – rocks, minerals and fossils for our experts to help you identify them.

**Event: 222, Map: 64, Hands on, Drop in, All ages**



DUNLEIGH

11am – 12noon

## Colourful creations

Museum of Classical Archaeology, Faculty of Classics, Sidgwick Avenue, CB3 9DA

Join us at the Museum of Classical Archaeology as we learn all about colour. We'll be looking at painted statues in the Museum, learning about how to mix colours and designing our own colourful creations.

**Event: 223, Map: 34, Hands on, Ages 4 – 6, Pre book tel: 01223 330402, email: museum-education@classics.cam.ac.uk or visit: www.classics.cam.ac.uk/museum**

11am – 12.30pm

## Beasts in the University Library: patterns in parchment and structures in skin

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

What is parchment? Come to Cambridge University Library and explore the science behind this extraordinary material. See how parchment is made and how it has been used in the production of books for hundreds of years. In addition, hear about the latest scientific research into the identification of the animal origin of many manuscripts.

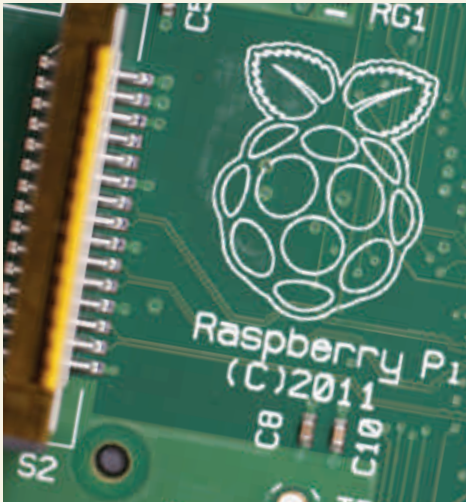
**Event: 224, Map: 10, Workshop, Ages 15+, Pre book\***

**11am – 1pm****Planes, lasers and spectral sensors****Mill Lane Lecture Rooms, Mill Lane, CB2 1RW**

Find out about the work of Dr David Coomes, which focuses on how and why the world's forests are changing and how he uses his research to inform conservation policy. He will demonstrate the LiDAR remote sensing technology that measures distance by illuminating a target with a laser and analysing the reflected light in his research on forest dynamics.

**Event: 225, Map: 30, Talk, Ages 12+, Pre book\***

GJSBERT PEJUS

**11am – 1pm****Competition of life game: how would you run the planet?****Department of Geography, Downing Street, CB2 3EN**

In a world of finite resources do you take as much as you can or save for an unpredictable future? This interactive game lets you try your luck as the CEO of Earth in a range of possible scenarios.

**Event: 226, Map: 57, Hands on, All ages, Pre book\*****11am – 3.30pm****Structures and patterns all around****Wandlebury Country Park, Stable Rooms, Gog Magog Hills, CB22 3AE**

Stroll around Wandlebury searching for structures and patterns suggested on our I spy sheet and return to our stable rooms and paddock to look more closely at them. Then use and recreate these in arty and crafty ways!

**Event: 227, Map: online, Hands on, Drop in, All ages, Normal car parking charges apply****Also on this day: Events 5, 6, 7, 15, 16, 17, 58, 59 and 152****11am – 4pm****Discover Fijian patterns****Museum of Archaeology and Anthropology, Downing Street, CB2 3DZ**

Explore patterns in the chiefs and governors: art and power in Fiji exhibition with these drop-in activities and crafts for all the family.

**Event: 228, Map: 61, Hands on, Drop in, All ages****10.30am – 12.30pm, 1.30pm – 3.30pm****How to make music with Raspberry Pi****Cambridge Junction, Clifton Way, CB1 7GX**

In a two hour workshop, you will get the chance to learn some basic coding, allowing you to create music on the Raspberry Pi computer. Supported by Dr Sam Aaron, Research Associate at the University of Cambridge Computer Laboratory and Rachel Drury, Creative Producer.

**Event: 229, Map: 7, Workshop, All ages,****Pre book tel: 01223 511511 or visit:****<http://www.junction.co.uk>, £3****6pm – 7.30pm****Innovation and development Hackathon Finale: global food security****The Pitt Building, Trumpington Street, CB2 1RP**

Find out how interdisciplinary student teams have worked with organisational mentors over an intensive week to develop ways to improve global food security. Following presentations, pose questions, vote for your favourite and join the Humanitarian Centre for refreshments and discussion.

**Event: 230, Map: 46, Talk, Ages 12+, Pre book\*****7.30pm – 9pm****Tangram Theatre Company: Albert Einstein: relativistically speaking****Cambridge Junction, Clifton Way, CB1 7GX**

Join Albert, the genius behind the übercoolest moustache in science, for a lecture like none you've ever attended. The eccentric theoretical physicist is accompanied by his two wives and mum on the piano, and by guest rapper MC Squared, as he quantum leaps us through two world wars, two theories of relativity, and the deployment of two very big bombs. Warning: features the wurst sausage joke ever.

**Event: 231, Map: 7, Talk, Ages 8+, Pre book tel:****01223 511511, email: [tickets@junction.co.uk](mailto:tickets@junction.co.uk),****or visit: [www.junction.co.uk](http://www.junction.co.uk), £12, £8****concessions**

# CSF@Cambridge Biomedical Campus

## Sunday 23 March

Join us on a journey from 'bench to bedside' as we explore some of the life-changing medical research conducted here in Cambridge. See how this research is translated into new treatments in our hospitals and new drugs from the pharmaceutical industry through talks, workshops and hands on activities. Located at the Cambridge Biomedical Campus, this fascinating new addition to the Science Festival gives us all the opportunity to talk to clinical researchers about how their work impacts our lives now and how it will shape our lives in the future.

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.

## Highlights

Page 45

### The drugs don't work

Professor Dame Sally Davies, Chief Medical Officer, discusses the consequences of our long-term abuse of antibiotics.

Page 45

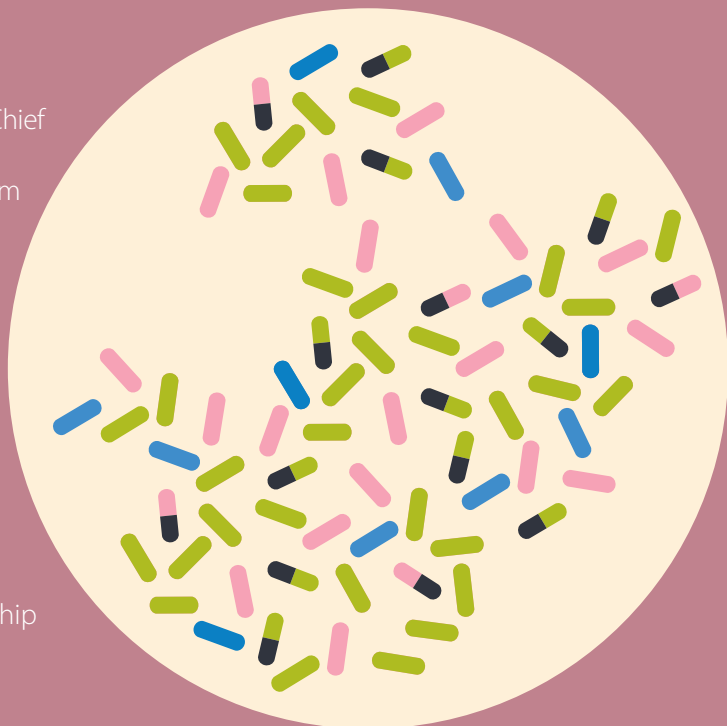
### Naked neuroscience

Join the Naked Scientists on an interactive journey through the workings of our nervous system.

Page 47

### Behind the scenes

A day of activities in partnership with Cambridge University Hospitals.



# Talks@CBC

Clinical School, Cambridge Biomedical Campus, Hills Road, CB2 0SP

Map: 76, Talk, Ages 12+, Pre book\* (unless otherwise stated)



- |   |          |
|---|----------|
| 74 Addenbrooke's Treatment Centre         | T, S, Li |
| 75 Cancer Research UK Cambridge Institute | T, S, Li |
| 76 Clinical School                        | T, S, Li |
| 77 Deakin Centre                          | T, S, Li |

11am – 11.45am, 12noon – 12.45pm

## Become a Dementia Friend

Seminar Room

People with dementia need a helping hand to go about their daily lives and feel included in their local community. Dementia Friends gives people an idea of the small things they can do to make a difference to people living with dementia. Book to receive training as a Dementia Friend.

Event: 232

11.15am – 12noon, 12.15pm – 1pm,  
1.15pm – 2pm

## Cambridge University Hospital lecture series

Lecture theatre 2

Join leading scientists as they discuss their clinical research. Find about what they do and how their work could impact our lives in the future.

Event: 233

12noon – 1pm

## Open your mind with the Naked Scientists

William Harvey Lecture Theatre

Join the Naked Scientists on an interactive journey through our nervous system. If you are brave enough, we'll read your brainwaves, reveal how your nerves send and receive information, activate your muscles, fool your senses and spot when you are lying.

Event: 234, Ages 8+

2pm – 3pm

## Health up my street

Seminar Room

Public Health England lets you explore the latest health indicators, showing what illnesses people get where you live. Find out what makes people ill and what are the commonest causes of death. Discuss the data, how it is collected and why it matters. <http://fingertips.phe.org.uk/>

Event: 235

2pm – 3pm

## Cambridge University Hospital Chair's Lecture

William Harvey Lecture Theatre

The Chair of Cambridge University Hospitals NHS Foundation Trust welcomes everyone to this lecture to find out more about the world-leading medical research conducted here in Cambridge.

Event: 236

2.15pm – 3.15pm

## Dementia: what's needed now?

Lecture Theatre 2

The state of research into dementia and the commitment of G8 countries to trying to find a cure for dementia by 2025 will be discussed by leading dementia researcher Professor Carol Brayne with the agency responsible for dementia policy in the UK, Public Health England.

Event: 237

3.30pm – 4.30pm, Sunday 23 March

## The drugs don't work: a global threat

William Harvey Lecture Theatre

In association with RAND Europe

Professor Dame Sally Davies, Chief Medical Officer and Chief Scientific Adviser for England, will talk about the new inconvenient truth. As a result of our abuse of antibiotics in the 70 years since Penicillin was first manufactured, the bugs have developed resistance to our current range of antimicrobial drugs. If we do not take action across the globe now, then in a few decades we may start dying from the most commonplace of operations and ailments that can be treated easily today.

Event: 238

# CSF@CBC

**Clinical School, Cambridge  
Biomedical Campus, Hills Road,  
CB2 0SP**

**11am – 4pm**

**Map: 76, Hands on, Drop in, All  
ages (unless otherwise stated)**

## **Be a cancer research scientist for a day**

At the Cancer Research UK Cambridge Institute, we hope our discoveries in the laboratory will create significant benefits for patients at the clinic. We invite you to don a lab coat and be a scientist for a day. Enter our mini science lab – come and run a DNA gel, stain tissue sections and look at them down a microscope. Why not also try out virtual reality radiotherapy with our clinical cancer colleagues?

**Event: 239**

## **From EPIC patterns to better health**

Looking at patterns in the population allows us to understand the links between diet, lifestyle and health. Help us build Lego® graphs of grip-strength to see patterns in the Science Festival 2014 population! Explore balanced diets on our giant EPIC plate and experience for yourself the eye conditions we've been investigating in the EPIC project in the Department of Public Health and Primary Care.

**Event: 240**

## **Behind the scenes of cancer research**

Join scientists from the MRC Cancer Unit and Hutchison/MRC Research Centre to find out more about how we're trying to improve the detection and treatment of cancer. Together with our cancer research colleagues from across the Biomedical Campus, take a look at DNA mutations and unusual chromosomes, and have a go at some of the experiments we do in the lab everyday!

**Event: 241**

## **Endoscopy: discovering interesting facts about our digestive tract!**

The NIHR Clinical Investigation Ward is involved in research studies using endoscopy equipment to look inside our bodies. Come and try out our ultra-thin gastroscopes on a carton model – it's a bit like playing on a games console – and find out some interesting facts about your own digestive tract.

**Event: 242**

## **Don't just be a statistic, be informed**

Come and learn how we collect medical data and analyse it using statistics to improve public health. Join the MRC Biostatistics Unit to test your reaction time, see how random you are and weigh up evidence. Become a statistic in our trials and become informed about what we are doing and why!

**Event: 243**

## **Patterns of our lives: nature versus nurture**

Visit the MRC Epidemiology Unit and find out how we can identify patterns of genes and lifestyle factors that influence health in human populations. See how patterns of physical activity have changed over the years and how they might change in the future. Featuring gadgets, games and jumping up and down!

**Event: 244**

## **Energy and oxygen radicals**

Everybody needs to eat to get energy for daily activities. A special compartment in human cells, the mitochondrion, breaks down food components and makes a cellular fuel called ATP. This uses the oxygen we breathe but sometimes forms damaging oxygen radicals leading to illness and ageing. Scientists from the MRC Mitochondrial Biology Unit will use movies and computer games to show what happens.

**Event: 245**

## **Antibody angling: discovery of new medicines using phage display**

Join MedImmune scientists and learn how they find new antibody medicines by using viruses which grow only in bacteria. We make huge libraries of these viruses containing DNA coding for antibody proteins displayed on the surface and find those that bind to disease target molecules. Our activity involves building a model of virus displaying an antibody and showing binding to a therapeutic target.

**Event: 246**

## **Stem cell discoveries**

Come and find out all about the amazing world of stem cells. You can look after your own flask of stem cells in our Stem Cell Pet experiment; race to the finish line in our stem cell board game; view some short stem cell films 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.

**Event: 247**

## Fascinating fat

Have you ever wondered what fat does? We all know that if we eat too much we get fat, but having too little fat is just as unhealthy as having too much. Join the University of Cambridge Metabolic Research Laboratories and MRC Metabolic Diseases Unit in hands on activities and games that show you some fascinating facts about fat and why it is so important for everyday life.

**Event: 248**

## The big nose

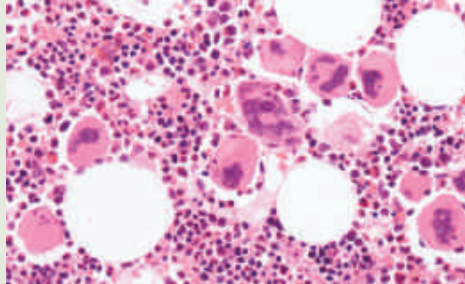
A giant (and we mean giant) nose takes centre stage as we explore aspects of allergies, sneezing and ...snot. Explore the niftiness of our noses with the help of our huge model of a nose and other activities, including making your own (fake) snot. Enthusiastic immunologists will be at hand to talk about their research. If you ask nicely they can explain why snot may be different colours, what the difference between a cold and the flu is and many related questions.

**Event: 249**

## Making medicines from A to Z

Learn how Astrazeneca scientists discover and develop new medicines. In this interactive experience, explore how chemistry and 3D modelling are used in the design and build of new drugs then explore how these drugs, alone or in combination, are tested in humans to treat diseases such as cancer. As our drug discovery train shows however the path to success can be complicated.

**Event: 250**



## 11am – 12noon, 12.30pm – 1.30pm, 2pm – 3pm Heart surgery theatre simulation: new tools for education

Papworth Hospital will be showcasing exciting new ways of training doctors by using a simulated theatre environment. For the first time with Papworth, you will be able to observe and be part of a simulated theatre experience to train clinical staff. Listen to a presentation explaining why and how simulations are a valuable tool in training the next generation of doctors and nurses and then have the opportunity to take part in the simulation yourself.

**Event: 251, Ages 12+, Pre book tel: 01480 364448, or email: [anne.scott@papworth.nhs.uk](mailto:anne.scott@papworth.nhs.uk)**

## 1pm – 1.45pm, 2pm – 2.45pm, 3pm – 3.45pm Developing new drugs: have a go at pharmacokinetic sampling!

The National Institute for Health Research (NIHR) Clinical Investigation Ward is involved in many research studies working towards the development of new treatments for cancer. During the development of new drugs detailed studies are undertaken to establish how quickly the body absorbs the drug and how long it stays in the body. Find out more about this aspect of medical research and have a go at 'pharmacokinetic' sampling yourself!

**Event: 252**

11am – 4pm

## Behind the scenes at Cambridge University Hospitals

Addenbrooke's Treatment Centre, Keith Day Road, Addenbrookes Hospital, Cambridge Biomedical Campus, CB2 0SL

Working in partnership with Cambridge University Hospitals, we bring you a day of activities and scientific discoveries which take us behind the scenes of one of the UK's largest teaching hospitals. This is a unique chance to delve into the hi-tech science, research and innovation taking place at the hospital.

See a demonstration of the cutting-edge da Vinci robot which takes surgery beyond the limits of the human hand and find out how scientists capture our memories and use that technology to understand and treat neurological disorders. Have a go at ultra-sound 3D imaging and take part in discussions with leading clinical scientists as they talk about ground-breaking drug treatments and advanced brain imaging technologies for newborn babies. Talk to people who work at the hospital about their varied careers, find out about the place of art in patient therapy and discover how the hospital is 'thinking green' and putting sustainable theatres into practice.

There will also be a chance to understand the 2020 Vision: the master plan for the Cambridge Biomedical Campus with the hospital at its heart.

**Event: 253, Map: 74, Hands on, Drop in, All ages**

## CSF in the city



OLIVIA



2pm – 5pm

### Ten minute chimney challenge

Cambridge Museum of Technology, The Old Pumping Station, Cheddars Lane, CB5 8LD

The Cambridge Museum of Technology boasts one of the most striking structures on Cambridge's skyline – our 55.8m high chimney. Take part in our competition to see who can build the tallest chimney from rubbish but the catch is that it has to stand up for 10 minutes.

**Event: 254, Map: online, Hands on, Drop in, All ages, Normal admission charge applies £3.50, concessions £2, children £1.50**

6.30pm – 7.30pm

### Festival choral evensong

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

Celebrate the Science Festival within the beautiful form of choral evensong according to The Book of Common Prayer 1662. Dr Ruth Bancewicz, Research Associate and Project Leader, The Test of FAITH, at the Faraday Institute for Science and Religion will preach on beauty.

**Event: 255, Map: 25, Service, Ages 12+**

Also on this day: Events 6, 7, 15, 16, 17 and 58

## Tell us what you think

Your feedback is important to us. You will have opportunities to give us your thoughts now, when you make a booking online, when you attend Festival events and when the Festival is over. Take the survey: [www.cam.ac.uk/science-festival/feedback](http://www.cam.ac.uk/science-festival/feedback)

By entering before 10 April, you will have the chance to win one of dozens of science kits that have been specially selected by the Science Festival team; terms apply.





# Public engagement

The Cambridge Science Festival is co-ordinated by the Public Engagement team at the University of Cambridge, [www.cam.ac.uk/publicengagement](http://www.cam.ac.uk/publicengagement). The best way to find out about future events is to subscribe to the free What's On mailing list, [www.cam.ac.uk/whatson](http://www.cam.ac.uk/whatson). Our major events are:

10 – 23 March

## Cambridge Science Festival

[www.cam.ac.uk/science-festival](http://www.cam.ac.uk/science-festival)

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12 – 14 September

## Open Cambridge

[www.cam.ac.uk/open-cambridge](http://www.cam.ac.uk/open-cambridge)

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20 October – 2 November

## Cambridge Festival of Ideas

[www.cam.ac.uk/festival-of-ideas](http://www.cam.ac.uk/festival-of-ideas)

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## Tips for attending the Festival

- There is no need to book for events unless otherwise stated.
- There may still be spaces available at events which are listed as 'pre book'; you are welcome to turn up and enquire on the day.
- Please note that entry may be refused if the venue is full or if you are late, even if you have made a booking.
- All events are free-of-charge unless otherwise stated.
- Please note that children should be accompanied at all times and use the minimum age guide indicated in the event description. For a number of events those under the minimum age may not be admitted due to the nature and content of the event. Please call ahead to check.
- Your attendance at any Festival event signifies your agreement to comply with the following guidelines for attendance: <http://bit.ly/MOpn1B>

Each year the Festival gets very busy with around 30,000 people attending over the two weeks. With such large numbers, we ask for your patience with staff and volunteers as queues can occur and resources are limited. The Festival is hosted in working departments and is run by staff and student volunteers, who are all trying to give you the best experience possible, as well as keeping as many events free-of-charge and accessible to everyone.

Please check our website for the latest updates on events and follow us on:



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



[#CSF2014](http://www.twitter.com/camscience)

# 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 below 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](mailto:csf@admin.cam.ac.uk); or call: 01223 766766, Monday – Friday, 10am – 4.30pm. The Cambridge University Disability Access Guide, including maps, is available here: [www.cam.ac.uk/disability](http://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, ring for details	PA		

### Cambridge city map

1 Arts School	T, S, Li
2 Anglia Ruskin University	Call: 0845 2713333
3 Arts Picturehouse	T, S, PA, I
4 Botanic Garden	T, S
5 Cambridge Buddhist Centre	T, PA
6 Cambridge Corn Exchange	T, S, Li, I
7 Cambridge Junction	T, S, I
8 Cambridge Science Centre	T, S
9 Cambridge Union	T, PA
10 Cambridge University Library	T, S, PA, I
11 CB2 Bistro	PA
12 Churchill College	S, PA
13 Department of Chemistry	T, PA
14 Department of Engineering	S, Li
15 Department of Pharmacology	T, S, Li, I
16 Department of Zoology	S
17 Donald McIntyre Building	T, S, Li
18 Downing College	T, S, Li, I
19 Emmanuel College	T, S, I
20 Emmanuel United Reformed Church	T, S, I
21 Friends Meeting House	T, S, Li
22 Gamersbus	PA
23 Grafton Shopping Centre	T, S, Li
24 Grand Arcade	T, S, Li
25 Great St Mary's Church	T, S, I
26 King's College	T, S, Li
27 Lady Mitchell Hall	T, S, Li, I
28 McCrum Lecture Theatre	T, Li, I
29 Michaelhouse Centre	T, S, Li
30 Mill Lane Lecture Rooms	T, S, Li
31 MRC Cognition and Brain Sciences Unit	T, S, Li, I
32 Mumford Theatre	T, S, I
33 Murray Edwards College	T, S, Li, I
34 Museum of Classical Archaeology	T, S, PA
35 Robinson College	T, S, I
36 Ruskin Gallery	T, S, Li
37 Sainsbury Laboratory	T, S, Li, I
38 Senate House	T, S, PA
39 St Catharine's College, McGrath Centre	T, S, Li
40 St Columba Hall	T, S, Li, I
41 St John's College	T, S, Li, I
42 St John's College, Divinity School Theatre	T, S, Li, I
43 The Fitzwilliam Museum	T, S, I
44 The Guildhall	T, S, Li
45 The Maypole Pub	PA
46 The Pitt Building	T, S, Li, I
47 The Polar Museum	T, S, Li

48 The Portland Arms	PA
49 Titan Teaching Room 1	PA
50 Tourist Information Centre	PA
51 University Centre	T, S, Li
52 Wesley Methodist Church	S, I
53 West Road Concert Hall	T, S, I
54 Whipple Museum of the History of Science	T, S, Li

### Downing Site

55 Anatomy Lecture Theatre	T, S, Li
56 Department of Biochemistry	T, Li, S, I, PA
57 Department of Geography	T, S
58 Department of Pathology	T, S, Li, PA
59 Department of Psychology	S, Li
60 McDonald Institute for Archaeological Research	T, S, PA, I
61 Museum of Archaeology and Anthropology	T, S, Li, I
62 Physiology Building	T, S, Li
63 Plant Sciences Marquee	S
64 Sedgwick Museum of Earth Sciences	T, PA, Li

### West Cambridge Site

65 Cavendish Laboratory	T, S, Li, I
66 Centre for Mathematical Sciences	T, S, Li, I
67 Department of Materials Sciences and Metallurgy	T, S, Li, I
68 Geological Conservation Unit	PA
69 Hauser Forum	T, S, Li
70 Institute of Astronomy	T, PA
71 Institute for Manufacturing	S, PA
72 Isaac Newton Institute for Mathematical Sciences	T, S, Li, I
73 University of Cambridge Sports Centre	T, S, Li

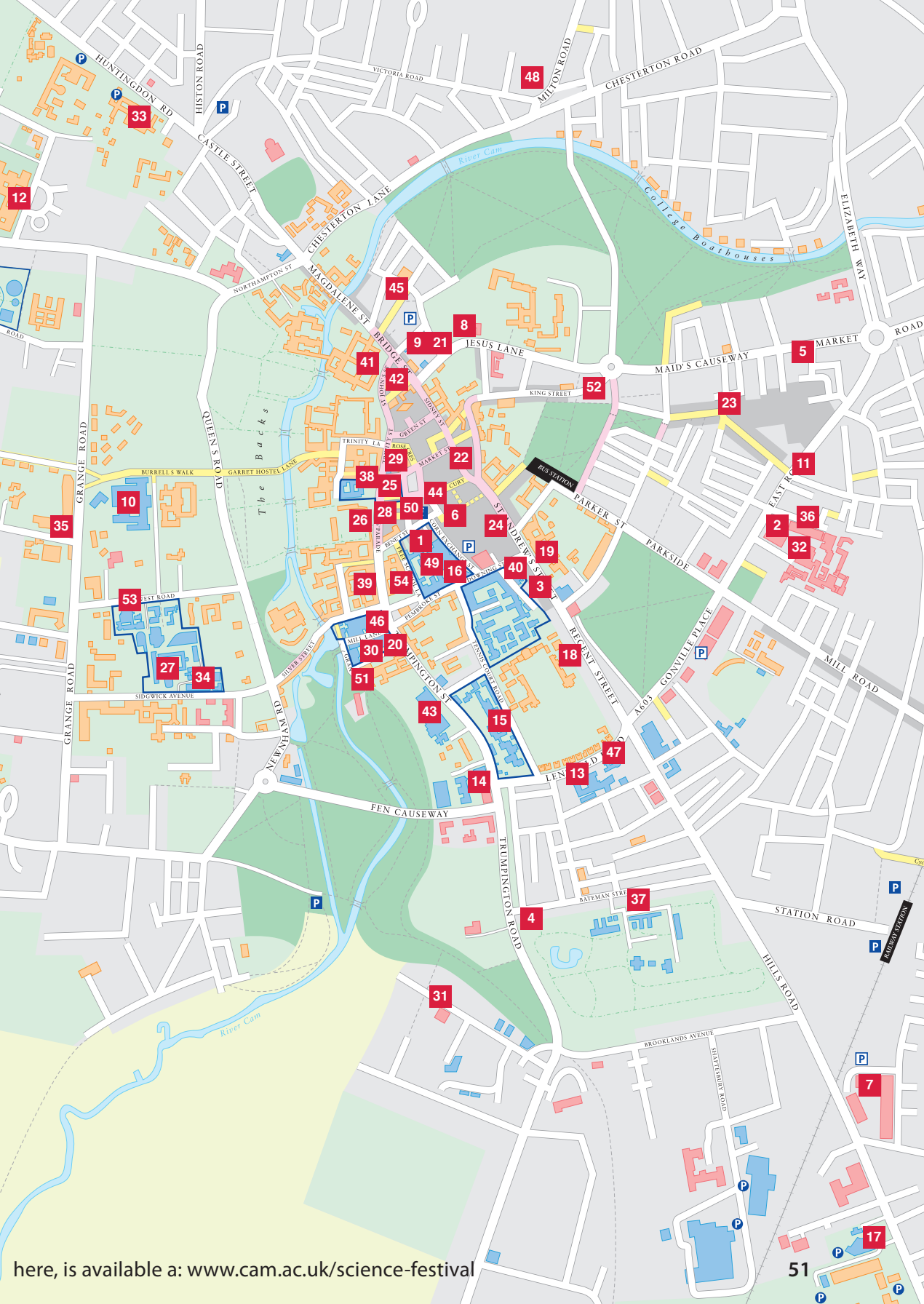
### Cambridge Biomedical Campus

74 Addenbrooke's Treatment Centre	T, S, Li
75 Cancer Research UK Cambridge Institute	T, S, Li
76 Clinical School	T, S, Li
77 Deakin Centre	T, S, Li

### Venues not listed on map

Cambridge Museum of Technology	T, S
Cambridge Regional College	T, S, Li
Hester Adrian Centre	T, S, Li, I
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
Wellcome Trust Genome Campus	T, S, Li, I





here, is available a: [www.cam.ac.uk/science-festival](http://www.cam.ac.uk/science-festival)

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