

April

Return of the modern alchemist: Just add water

Family

Monday 4 April, 2.30pm – 3.45pm and 6.00pm – 7.15pm

How can a drop of water start a fire or cause an explosion? Why can't you put a chip pan fire out with water or boil an egg on Mount Everest? Peter Wothers, the 2012 Christmas Lecturer, will show you some of the surprising properties and reactions of this substance you thought you knew so well.

Tickets: £14/£10 concession. Discounts for Members.

The Serengeti rules

Wednesday 6 April, 7.00pm – 8.30pm

In telling the stories of some of the greatest discoveries of 20th century biology, Sean B. Carroll reveals how a few simple rules govern all life on earth, from the cells in our bodies to populations of animals on the Serengeti. Come and discover why modern biology holds the key to remedying our greatest medical and ecological challenges.

Tickets: £14/£10 concession. Discounts for Members.

Thinking: A user's guide

Monday 11 April, 7.00pm – 8.30pm

There is vastly more going on in our heads than we realise. In this lightning tour of human reasoning, world-renowned psychologist Richard Nisbett, author of *Mindware: Tools for Smart Thinking*, shines a new light on the shadowy world of the way we think – and how we can make our lives better.

Tickets: £14/£10 concession. Discounts for Members.

Family

The invisible night sky

Thursday 14 April, 6.00pm – 7.15pm

Gazing at the night sky with our eyes or telescopes reveals twinkling stars and far away galaxies. But visible light is only a small part of what some of these objects are emitting. Join astrophysicist Jen Gupta to discover views of the Universe at other wavelengths, from familiar objects like our Sun to weird and wonderful distant quasars, and learn some of the physics behind these views.

Tickets: £14/£10 concession. Discounts for Members.

The extraordinary theorems of John Nash

Discourse

Friday 29 April, 7.50pm – 9.15pm

On 23 May 2015, John Forbes Nash tragically died in a taxi accident, just after receiving the most prestigious award a mathematician can dream of, the Abel Prize. This tragedy was the last event in a life which saw Nash become an icon of human genius, recipient of the Nobel Prize and hero of a Hollywood movie. But most of all, Nash founded several new chapters of game theory and geometric analysis seemingly out of nowhere. Fields medal winner, Cédric Villani will take us through this very special world of mathematical creation.

Tickets: £18/£15 concession. Discounts for Members.

Science short courses

Aimed at anyone who wants to explore a subject in more depth than a one-off lecture, but without the formality of a university course, our short courses provide you with access to world-class researchers in a social atmosphere. Coming up, we have a six-week course on science and religion with Frank James starting in January and a week-long introduction to evolution in April with Steve Cook. Visit rigb.org/education/short-courses for details.



Science Lives Here

About us

The Royal Institution is an independent charity and our mission is to encourage people to think more deeply about the wonders and applications of science. This commitment drives everything we do – from our world famous CHRISTMAS LECTURES and workshops in the L'Oréal Young Scientist Centre to Masterclasses for young people around the country.



Join our community

Ri Patrons and Members are at the heart of the Ri and their support is vital in helping us deliver our mission. Join a vibrant community of like-minded people who share your curiosity and passion for science and receive an array of exclusive benefits depending on your level of support. For more information, visit rigb.org/join



Science films

Catch up with events, watch our short films and animations, rediscover past CHRISTMAS LECTURES, enjoy the best science films from across the web, and use our Experimental series to do science experiments at home. Visit richannel.org or subscribe at youtube.com/TheRoyalInstitution



Faraday Museum

Explore the world-changing scientific discoveries made throughout the Ri's history, from 1799 to today. Find Faraday's original laboratory from the 1850s, the first electric motor and Davy's miners' lamp. **Free admission**



Looking for a venue?

A memorable venue in the heart of Mayfair, the Ri is available to hire for all types of events. From conferences to weddings, the Ri is the perfect backdrop for any meeting, party or celebration. For more information visit venue.rigb.org or contact the team at venuehire@ri.ac.uk and 020 7491 6565



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Ticket booking information

Book online at rigb.org/whats-on or call 020 7409 2992
Royal Institution open
8.00am – 6.00pm Monday to Friday
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Science Lives Here

January – April 2016

What's on



January

Dark matter and dinosaurs: Astounding interconnectedness in the Universe

Monday 11 January, 7.00pm – 8.30pm

66 million years ago, a 10-mile-wide object from outer space hurtled into the Earth at incredible speed and destroyed the dinosaurs, along with three-quarters of the other species on the planet. Where did it come from and why?

Lisa Randall will tell the story of the Big Bang theory, cosmological inflation and the makeup of the Universe, as well as the radical idea that dark matter might ultimately have been responsible for the dinosaurs' extinction.

Tickets: £14/£10 concession. Discounts for Members.

Herding Hemingway's cats: How do our genes work?

Thursday 14 January, 7.00pm – 8.30pm

We've all heard of genes, but how do they actually work? Geneticist **Kat Arney** and her scientific guests will draw on stories ranging from six-toed cats to fish hips, exploring how DNA is packed, unpacked and read.

Tickets: £14/£10 concession. Discounts for Members.

Blame the brain: How neurononsense keeps women in their place

Wednesday 20 January, 7.00pm – 8.30pm

There is a long history of debate about biological sex differences and their part in determining gender roles. The debate continues, with brain imaging techniques and the idea of hardwiring being used as evidence of the 'essential' differences between men and women. **Gina Rippon** offers ways of rooting out the neurotrash, stamping out the neurosexism and making way for neurons.

Tickets: £14/£10 concession. Discounts for Members.

Performing matter: Greatest hits and new findings

Family

Friday 22 January, 6.00pm – 7.15pm

Materials perform. Stuff is constantly getting up to things. Matter is *doing* all the time, just to exist and make up the world of objects. In this demo-led exploration of materials, **Zoe Laughlin** will show the micro becoming macro, the inanimate becoming animate and materials performing. This is your chance to witness some of the most wondrous matter; from shape-memory paperclips to magnetic liquids, non-Newtonian fluids and self-healing concrete.

Tickets: £14/£10 concession. Discounts for Members.

Changes of state and mind: A new phase for structural biology?

Discourse

Friday 29 January, 7.50pm – 9.15pm

Current methods of determining a protein's structure require it to be dissolved in a solution or locked in a crystal lattice. But what about the third phase?

While many scientists thought a vapour phase was impossible, **Carol Robinson** embarked on eccentric research in this area. Learn how her work proved to be unpredictably worthwhile, and her gas phase structural biology is providing a new view of dynamic interactions between proteins, lipids and drugs.

Tickets: £18/£15 concession. Discounts for Members.

February

The aliens are coming!

Thursday 4 February, 7.00pm – 8.30pm

For millennia, we have looked up at the stars and wondered whether we are alone in the Universe. In the last few years, scientists have made huge strides towards answering that question. Comedian and bestselling science writer **Ben Miller** will take us on a fantastic voyage of discovery, from the beginnings of life on earth to the very latest search for alien intelligence.

Tickets: £14/£10 concession. Discounts for Members.



Image by Gabriel Pollard via Wikimedia Commons [CC BY-SA 2.5]
Other images: Katherine Leedale, Paul Clarke and the Ri

WiFi wars!

Friday 5 February, 7.00pm – 9.00pm

Making a triumphant return to the Ri, WiFi wars is a live comedy game show where you play along! Log in with your smartphone or tablet (make sure you've got plenty of battery) and compete in a range of games, quizzes and challenges against other members of the audience.

Tickets: £14/£10 concession. Discounts for Members.

Fire and explosions: The science of pyrotechnic effects

Family

Monday 15 February, 6.00pm – 7.15pm

How do we make gunpowder and launch fireworks in the air? What about breathing fire? Join pyrotechnician and science communicator **Matthew Tosh** for a journey from fundamental combustion to the complex visual effects seen around the world. Be prepared for some fiery demos and explosive bangs.

Tickets: £14/£10 concession. Discounts for Members.

The science of sleep: Melatonin to neural pathways

Thursday 18 February, 7.00pm – 8.30pm

Not only do physiological processes drive our circadian clock, sleeplessness also disrupts hormone release patterns, with far-reaching implications on our health. Neuroscientist **Russell Foster** and a panel of experts will discuss why we need sleep and the physiological and neural processes behind it.

Funded by the British Psychological Society and the Society for Endocrinology.

Tickets: £14/£10 concession. Discounts for Members.

Family Fun Day: How to survive in space

Family

Sunday 21 February, drop in between 11.00am and 4.00pm

The 2015 CHRISTMAS LECTURES are all about how to survive in space, looking at exciting space missions, exploring the future of space travel, and examining the challenges of protecting human life outside the Earth's atmosphere. Come and take part in activities and see amazing demonstrations about human survival against all the odds. Aimed at ages 6 – 12.

Tickets: £14/£7 under 18s. Discounts for Members.

Building a climate laboratory

Discourse

Friday 26 February, 7.50pm – 9.15pm

Climate change is arguably one of the greatest challenges that human civilisation will face in the 21st century. We may be taking the planet into uncharted territory. **Julia Slingo**, Met Office Chief Scientist and High Level Group Scientific Advisor to the European Commission, will examine key processes that control the climate system, and how they are encapsulated in climate models; models that allow us to look into the future of our world.

Tickets: £18/£15 concession. Discounts for Members.

Cheats and deceits: Deception in nature

Monday 29 February, 7.00pm – 8.30pm

In the constant battle to survive and reproduce, many organisms don't play fair – they deceive and manipulate others in order to lure unsuspecting prey, avoid attack from predators, coerce mates and trick others into rearing their young.

Martin Stevens will showcase our latest understanding of deception in nature, using examples from ant-mimicking spiders to cheating cuckoos.

Tickets: £14/£10 concession. Discounts for Members.

March

The Universe: A detective story

Tuesday 1 March, 7.00pm – 8.30pm

Modern fundamental physics contains ideas that may radically change our understanding of the world; ideas such as extra dimensions of space, or the possible existence of other universes. At the Big Bang, the Universe left clues about the origin of the cosmos as we know it, and how it is evolving. Join **Hiranya Peiris** to unravel the detective story of the Universe.

Tickets: £14/£10 concession. Discounts for Members.

Ri Lates: Surviving in space

Ri Lates

Friday 11 March, drop in between 6.30pm and 10.30pm

The 2015 CHRISTMAS LECTURES are all about how to survive in space – now the adults can join in, try out demos from the Lectures and hear from experts in space science and cosmology. Listen to talks in our theatre and explore the rest of the Ri for hands-on activities and demonstrations, in celebration of space exploration through the ages.

Tickets: £14/£10 concession. Discounts for Members.

Who's responsible?

The conversation

Wednesday 16 March, 7.00pm – 8.30pm

The concept of 'responsibility' is one that crosses the boundaries of science and art, culture and business. From a doctor's responsibility towards their patient, to the responsibility of a writer to their characters and one generation's responsibility to the next, this simple term throws up a host of moral and ethical issues. **Bonnie Greer** and **Hugh Montgomery** will discuss how the concept informs their work.

Tickets: £14/£10 concession. Discounts for Members.

U3A at the Ri: Paranormal beliefs and antibiotic resistance

Thursday 17 March, 2.00pm – 5.00pm

We team up with the University of the Third Age for an afternoon of fascinating talks open to all, covering everything from antibiotic resistance to the the psychology of the paranormal.

Tickets: £20 U3A members should book through their local branch.

Examining the self

Discourse

Thursday 31 March, 7.50pm – 9.15pm

'The self' is an intangible and perhaps illusory entity which is essential to our understanding of modernity. As a historical development, it is relatively recent; modern day notions of 'the self' would not be recognisable to antiquity, or even to a medieval writer. Literature is like archaeology for the idea of the private self as a subject worthy of report, study and daily experience. Join novelist **Ian McEwan** to examine the self, drawing on philosophy and neuroscience.

Tickets: £18/£15 concession. Discounts for Members.



An image of the mosquito cell inkblot test by Miranda Whitten from the College of Medicine at Swansea University. This image, and the front cover image of a metallic particle by Mark Coleman from the College of Engineering, will be part of an Ri exhibition from January. In collaboration with Swansea University Research Forum.