



What's on

Talks, workshops and events

Everyone is welcome at The Royal Institution

Since 1799 the Royal Institution has played host to some of the world's greatest thinkers. From Michael Faraday to Kathleen Lonsdale to David Attenborough, we've announced scientific firsts, introduced the process of exploration to curious young minds and have been bringing science to life for everyone since day one. Experience this first-hand through our spring programme of events and discover the ways science impacts our lives.

Watch a talk from a leading scientist or cultural commentator in our historic Theatre or online.

Visit our internationally renowned museum, open weekdays, to everyone, for free.

Experience hands-on exploration together through our family events.

Join our community of like-minded Members and engage with the science you love more regularly.

Book tickets to any event on <u>our website</u> or by contacting our events team on +44 (0)20 7409 2992 between 9.30am and 5.00pm Monday to Friday.

Events: £7 Ri Members and Ri Patrons; £16 standard; £10 concessions

Livestreams: Ri Members and Ri Patrons from £3; Pay what you can from £5

Discourses: free for Ri Members and Ri Patrons; £20 standard; £15 concessions

Concessionary ticket prices apply to over 65s, under 16s, anyone registered as a student, unemployed or disabled. Free tickets are offered to carers attending with the person receiving care. Special concessionary rates are offered to educators attending with school groups.

Book online at rigb.org/whats-on



Spring

January

Ri 2023: Public programme launch

Thursday 12 January, 7.00pm - 8.30pm

How proof and logic shaped mathematics

Tuesday 17 January, 8.00pm - 9.00pm

Why light threatens life

Thursday 19 January, 7.00pm - 8.30pm

Spider sense: Uncover the secrets of spiders

Monday 23 January, 7.00pm - 8.30pm

An introduction to mathematical inteligence

Starts Monday 23 January, 7.00pm - 8.30pm weekly

Discover the inside story of parasites

Wednesday 25 January, 7.00pm – 8.30pm

DNA: genetics, genealogy and forensics

Thursday 26 January, 7.20pm - 8.45pm

Rapid motion through space

Friday 27 January, 7.00pm - 9.30pm

Lost and found in the science of emotion

Monday 30 January, 7.00pm - 8.30pm

Neofossils: Can plastics capture Co2?

Tuesday 31 January, 7.00pm - 9.30pm

February

Building the Universe with mathematics

Wednesday 1 February, 7.00pm - 8.30pm

Predators and people: A deadly balance

Thursday 2 February, 7.00pm - 8.30pm

A molecular tale: What your fingerprints say

Tuesday 7 February, 7.00pm - 8.30pm

The imagination machine

Wednesday 8 February, 7.00pm - 8.30pm

Unlocking the mysteries of the heart

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The patriarchs: How men came to rule

Thursday 2 March, 7.00pm - 8.30pm

Realising your goals through philosophy

Tuesday 7 March, 7.00pm – 8.30pm

Seven inventions that changed the world

Thursday 9 March, 7.00pm - 8.30pm

Wifi Wars debug XV

Friday 10 March, 7.00pm - 8.30pm

The DaVinci masterclass (short course)

Starts Monday 13 March, 7.00pm - 8.30pm weekly

For your inspiration: Inside DNA

Friday 17 March, 7.00pm - 8.30pm

April

How 26 lines of code changed the world

Monday 3 April, 7.00pm - 8.30pm

An exploration of maths and life

Wednesday 5 April, 7.00pm - 8.30pm

A traveller's guide to the stars

Thursday 6 April, 7.oopm - 8.3opm

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The science of menopause and it's impact

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An anatomy of hope

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The geometry of chaos

Friday 21 April, 7.00pm - 8.30pm

Metabolites: The key to treating Alzheimer's

Monday 24 April, 7.00pm - 8.30pm

The dark energy of Einstein's aftermath

Tuesday 25 April, 7.00pm - 8.30pm

January



Ri 2023: Public programme launch

Thursday 12 January, 7.00pm - 8.30pm

Join the Ri demonstration team for an action packed lecture titled 'Energy Live' – an exciting, and demo packed, journey through the stores of energy we use every day. From elastic to gravitational, kinetic to chemical, see some fiery and maybe even explosive demonstrations of what energy is, where it comes from, and where it goes.



How proof and logic shaped mathematics

Tuesday 17 January, 8.00pm - 9.00pm

Join John Stillwell as he demonstrates that proof is a mathematically vital concept, inspiring innovation and playing a critical role in generating knowledge. In this talk, discover the areas of number theory, non-Euclidean geometry, topology, and logic, and peer into the deep chasm between natural number arithmetic and the real numbers.



Why light threatens life

Thursday 19 January, 7.00pm - 8.30pm

The light bulb – long the symbol of progress – needs to be turned off. To ensure a bright future, we must embrace the darkness. The world's flora and fauna have evolved to operate in the natural cycle of day and night. But constant illumination has made light pollution a major issue. Johan Eklöf encourages us to appreciate natural darkness.



An introduction to mathematical intelligence (short course)

Starts 23 January, 7.00pm - 8.30pm

We need to embrace a different brand of maths; one that privileges our uniquely human thinking skills - those not so easily automated. In the latest of our popular short courses, research mathematician **Junaid Mubeen** takes a hands-on approach to exploring these more creative aspects of mathematics.



January



Spider sense: Uncover the secrets of spiders

Monday 23 January, 7.00pm - 8.30pm

We encounter spiders often, but how much do we really know about them? Join **Sara Goodacre**, founder of SpiderLab and professor in evolutionary biology and genetics in an evening exploring the diversity of spiders – much of which cannot easily be seen. Discover more about these fascinating creatures and the secrets they hold.



Discover the inside story of parasites

Wednesday 25 January, 7.00pm - 8.30pm

Parasites are the most abundant form of life on Earth. They come in all shapes and sizes and inhabit every free-living organism. Join **Scott Gardner** and **Gabor Racz** as they explore how parasites survive and evolve in changing environments and their influence in providing stability to ecosystems.



Discourse – DNA: genetics, genealogy and forensics

Thursday 26 January, 7.20pm - 8.45pm

In this discourse, geneticist Professor **Turi King** will chart the rise in the use of DNA in genealogy and forensics for everything from tracing long lost family members to catching criminals. Her examples will include the first immigration case through to – of course – identifying the bones of King Richard III.



Rapid motion through space: An incomplete history of speed

Friday 27 January, 7.00pm - 9.30pm

This unique event will include the premiere screening of Cosmic Shambles first feature length documentary and a panel discussion delving into the story behind its creation. The panel will be chaired by **Robin Ince** with experts including director **Trent Burton**, **Dr Helen Czerski**, **Matt Parker** and more.

See more for free at rigb.org/join

January



Lost and found in the science of emotion

Monday 30 January, 7.00pm - 8.30pm

Why can't we think straight when hungry? What's the point of nightmares? And why can't we forget embarrassing memories? Emotions can be a pain. After losing his dad to Covid-19, **Dean Burnett** found himself wondering what life would be like without them. And so, he decided to put his feelings under the microscope – for science.



Neofossils: Can plastics capture Co2?

Tuesday 31 January, 7.00pm - 8.30pm

The news is full of the evils of plastic. But plastic can't be evil, it's inanimate. It's plastic abuse that's morally wrong. Join former Christmas Lecturer **Tony Ryan** as he explains how systems-based, multidisciplinary approaches can solve the problem of plastics in the environment through a combination of reuse, repurposing & recycling.





With a small group of like-minded peers you can really get to the heart of a subject under the guidence of our expert course leaders.

Ri Members and Ri Patrons receive a 15% discount on short courses

January short course

An introduction to mathematical intelligence



January 23 – February 27

There are many types of mathematics. The brand of 'school maths' that dominates our schooling experiences is heavily based on calculation and execution of known procedures - skills that computers excel at. As we usher in the era of smart machines, we need to embrace a different brand of mathematics, one that privileges our uniquely human thinking skills.

This course takes a hands-on approach to exploring these more creative aspects of mathematics. Through a mixture of games, puzzles and real-world examples, we will uncover facets of mathematical intelligence that play to our human strengths and can help give us an edge over computers.

Course content

The historical relationship between humans and technology, and why computers are to be embraced as tools to augment our thinking

Our natural sense of number and why estimation comes more naturally to us than precise calculation

The unflinching rigour of mathematical proofs...and how to construct them

Mathematical card tricks and the art of not being fooled

Graph theory and other products of our human curiosity

P vs NP and the problems that lie beyond computation (how maths can make you a millionaire)

Course leader: Junaid Mubeen

Junaid is a mathematician turned educator. He has spent the past decade working on innovative learning technologies and is currently partnering with bestselling science author Simon Singh to develop online maths programmes for students worldwide. He has a DPhil in maths from Oxford and a Master's in Education from Harvard, where he studied as a Kennedy Scholar.



February



Building the Universe with mathematics

Wednesday 1 February, 7.00pm - 8.30pm

Our universe has multiple origin stories, from religious creation myths to the Big Bang of scientists. But if we leave those behind, how could we create a universe if there was no matter, cosmos or empty space? Discover how concepts like multi-dimensional crochet, infinity and relativity contribute to the course of existence.



Predators and people: A deadly balance

Thursday 2 February, 7.00pm - 8.30pm

The predators that can hunt, kill and eat us occupy a unique place in the human psyche. Whether it's lions in Africa, tigers in India or sharks in the world's oceans, we are fascinated by, and often terrified of, predators. Join biologist **Adam Hart** as he explores the complex relationships we have with predators.



A molecular tale: What your fingerprints say

Tuesday 7 February, 7.00pm - 8.30pm

Fingerprinting techniques have been in use for over 100 years, and knowledge is developing on both sides of the law as criminals and investigators constantly try to outsmart each other. Join **Simona Francese** as she explores pioneering research intro Matrix Assisted Laser Desorption Ionisation Mass Spectrometry.

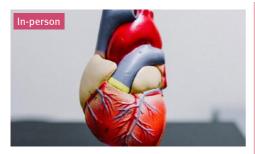


The imagination machine: Revisiting creativity

Wednesday 8 February, 7.00pm - 8.30pm

Our ability to imagine change is our defining human power. Over the past two centuries, there has also been a growing awareness of our ability to direct it. **Martin Reeves** will explain how a misunderstanding of what imagination is has been holding us back. In particular, he reappraises romantic notions of imagination.

February



Unlocking the mysteries of the heart

Monday 13 February, 7.00pm - 8.30pm

Your heart is a miracle in motion, a marvel of construction unsurpassed by any human-made creation. Despite decades of effort in labs all over the world, we have not yet been able to replicate the heart's perfect engineering. Sian Harding will share new scientific developments that are opening up the mysteries of the heart.



Tasting the science of beer

Friday 17 February, 7.00pm - 8.30pm

From Roman soldiers to modern pub-goers, what's the science behind beer's success? Join Beer Sommelier Natalya Watson for a talk and guided tasting through the science of beer. In this talk, explore beer's four main ingredients and how they're combined in the brewing process to create such a broad range of colours, flavours, and styles.



Discourse – How geometry created modern physics

Friday 24 February, 7.20pm - 8.45pm

Geometry has always been about far more than the measurement of shapes. From geometry's classical beginnings, via the Renaissance and the Enlightenment, to the present day, Yang-Hui He will take us on a journey through time and space, culminating in our understanding of spacetime itself.





March



The patriarchs: How men came to rule

Thursday 2 March, 7.00pm - 8.30pm

How did societies develop across the globe, and how did gender become so enmeshed in them? Award-winning science journalist **Angela Saini** goes in search of the true roots of gendered oppression. She will uncover a complex history of how it first became embedded in societies and spread across the globe from prehistory into the present.



Realising your goals through philosophy

Tuesday 7 March, 7.00pm - 8.30pm

What do you want out of life? The things we care about in life often conflict, preventing us from doing what matters most to us. How do we start thinking about our goals to enable us to reflect on them effectively? Join philosopher **Valerie Tiberius** as she discusses invaluable advice about living well by understanding your values.



Seven inventions that changed the world

Thursday 9 March, 7.00pm - 8.30pm

Smartphones, skyscrapers, spacecraft. Modern technology seems mind-bogglingly complex. But beneath the surface, it can be beautifully simple. Award-winning engineer and broadcaster **Roma Agrawal** deconstructs our most complex feats of engineering into seven fundamental inventions: the nail, spring, wheel, lens, magnet, string and pump.



The path towards air equality

Monday 20 March, 7.00pm - 8.30pm

Air pollution is responsible for the deaths of thousands in the UK each year and millions worldwide, yet it often feels like we are still scratching the surface when it comes to getting it under control. Mark Richards will examine the role that fundamental physics has played in characterising, monitoring, and detecting air pollution.



Ri Members and Patrons get more. Join today for better than half-price tickets to Ri talks, FREE tickets to Discourses, invitations to special events, priority booking on select events and exclusive access to the CHRISTMAS LECTURES ticket ballot.

For more information visit rigb.org/join or call +44 (0)20 7491 6588.

March



At the limits of astrophysics

Thursday 23 March, 7.00pm - 8.30pm

Much of modern astronomy sounds a lot like science fiction. Astrophysicist **Katy Clough** will discuss some of the more exotic possibilities for astrophysical objects, including wormholes and warp drives. She will explain how these objects fit within our current understanding of physics, and what we expect the limits to be.



First starlight: The quest for cosmic dawn

Monday 27 March, 7.00pm - 8.30pm

Astronomers are like time travellers. They scan the night sky for the outermost galaxies that first came into being when our universe was a mere fraction of its present age. Discover the triumphs and technical setbacks of astronomy over the years. Join **Richard Ellis** as he discusses his spectacular discoveries made in modern cosmology over his career.



On the origin of time: A quantum beginning

Tuesday 28 March, 7.oopm - 8.3opm

Journey into the extreme quantum physics of black holes and cosmic holograms. Holed up in at Cambridge, Stephen Hawking and his friend and collaborator **Thomas Hertog** worked shoulder to shoulder for twenty years on a quantum theory of the big bang. Join Thomas to learn more about their journey of discovery.



Discourse – An anatomy of hope

Friday 31 March, 7.20pm - 8.45pm

In this Discourse, **Kevin Fong** will uncover the response to the Covid -19 pandemic from the perspective of our frontline teams and share lessons from which we can all learn to better equip us for the future.



Can't make it to a talk?

For explosive short films, full length talks from the world's leading scientists and writers and videos to challenge the way you look at the world visit our YouTube channel. If you can't make it to a talk this is the next best thing and over 60 million video views say it's science worth watching.



Friday Evening Discourses started in the Royal Institution in 1825 as an informal discussion evening, but soon became so popular that the format moved to a more formal lecture in the Theare. Most major scientific figures have given a Discourse, communicating their latest discovery or idea. Our archives of these talks open a unique window on the world of Victorian science.

Take your place in history as these renowned lectures continue to inspire and expand your mind.

Discourses: £20; £15 concessions; free for Ri Members and Ri Patrons

Meet our spring Discourse speakers



Turi King

DNA family secrets: Genetics, genealogy and forensics Thursday 26 January

Geneticist Turi King started her career in archaeology She is working on a number of cold cases the most renowned being King Richard III. She has been conducting genetic genealogical research for over 20 years and is a BBC regular.



Yang-Hui He

How geometry created modern physics Friday 24 February

Fellow at the London Institute, Professor of Mathematics at City, University of London, Tutor in mathematics at Merton College, Oxford, and Chang-Jiang Chair of physics at Nankai University in China. He works at the interface of string theory, algebraic and combinatorial geometry, and machine learning.



Kevin Fong

An anatomy of hope Friday 31 March

Consultant anaesthetist at UCLH and professor of public engagement and innovation in the Department of Science, Technology, Education and Public Policy (STEaPP) at University College London and the 2015 Royal Institution Christmas Lecturer.

April



How 26 lines of code changed the world

Monday 3 April, 7.00pm - 8.30pm

Everything from law enforcement to space exploration relies on code written by people. Join **Torie Bosch** as she brings together many of today's leading technology experts to provide new perspectives on the code that shapes our lives and the human stories behind programming. Discover the importance of code that has changed our lives.



An exploration of maths and life

Wednesday 5 April, 7.oopm - 8.3opm

The world of mathematics is vast and connects with many aspects of our lives – and you don't need a formal mathematical background to understand it. Join mathematician and popular science author **Eugenia Cheng** as she sheds light on abstract mathematical ideas with examples of social justice, current events, and everyday life.



A traveller's guide to the stars

Thursday 6 April, 7.00pm - 8.30pm

The age-old dream of venturing forth into the cosmos and perhaps even colonising distant worlds may one day become a reality. Join **Les Johnson** as he explores the physics and technologies that may enable us to reach the stars. From the latest exoplanet discoveries to promising interstellar missions on the not-so-distant horizon.



Supernova science: Destruction in the stars

Tuesday 11 April, 7.00pm - 8.30pm

Thomas Haworth shares how the energy from massive stars is impacting the clusters and galaxies around them. From the destruction of planet-forming discs surrounding young stars to energy surges as the massive stars explode in supernovae, the lives of massive stars have farreaching consequences for their surroundings.

April



The science of menopause and its impact

Tuesday 18 April, 7.00pm - 8.30pm

The menopause is rarely spoken about, yet it affects half the world's population. Join menopause expert, author, and documentary maker Kate Muir and GP, Menopause Specialist Louise Newson and consultant gynaecologist Isaac Manyonda as they explore how the menopause affects our bodies and share the latest scientific research.



The geometry of chaos: Predicting our world

Friday 21 April, 7.00pm - 8.30pm

The geometry of chaos can explain our uncertain world, from weather and pandemics to quantum physics and free will. Join **Tim Palmer** as he explores how the geometry of chaos provides the means to predict the world around us and provides new insights into some of the most astonishing aspects of our universe and ourselves.



Metabolites: The key to treating Alzheimer's?

Monday 24 April, 7.00pm - 8.30pm

Metabolites are small molecules that grow within cells and tissue. Join **Priyanka Joshi** as she delves deeper into the biology of metabolite and protein homeostasis to show how metabolites function and cause dysfunction, with potential implications for aging, neurodegenerative diseases such as Alzheimer's disease, and long-COVID.



The dark energy of Einstein's aftermath

Tuesday 25 April, 7.00pm - 8.30pm

Uncover how future cosmological surveys will map the vast cosmic web of galaxies on scales so far only envisaged in computer simulations. **Chris Clarkson** will describe our current understanding of the Universe at large and unravel this delicate web that will reveal not only the nature of the Big Bang itself, but the essence of dark energy.

See more for free at rigb.org/join

Family events



The Turing Lectures: How to speak whale

Tuesday 14 February, 2.00pm - 3.15pm

Tom Mustill reveals how a close encounter with a humpback whale inspired him to find out whether we could ever talk to these ocean giants. We invite you to submerge yourself in Tom's underwater world and hear about the amazing advances scientists are making. This event is particularly suitable for 11+



Family Fun Day: Imaginative inventions (Free for Ri Young Members)

February 18 February, 11.00am - 4.00pm

From the ancient Greeks to the modern day, inventions have shaped the way society has grown and the world has progressed, with many of these important developments invented right here at the Ri. This event runs from 11am – 4pm and is packed full of talks, demonstrations and hands on science. This event is particularly suitable for 7–12



Echoes from the edge of space and time

Saturday 25 February, 2.00pm - 3.15pm

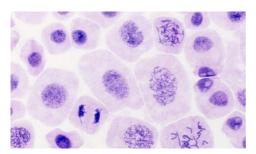
In this talk Ziri Younsi will explore how we are able to capture images of black holes using the Event Horizon Telescope, what we can learn from these images, and how these and future explorations will help advance our understanding of the origins of space, time, and the Universe itself. This event is particularly suitable for 13+



Wifi Wars debug XV

Friday 10 March, 7.00pm - 8.30pm

Future-tech video gaming comedy show WiFi Wars returns to the Ri for another fun night. Join Steve McNeil and Rob Sedgebeer as they connect an entire room of gamers to play as teams, or individuals against each other, on their latest gaming creations. A phone or tablet is needed. This event is particularly suitable for 13+



For your inspiration: Inside DNA

(Free for Ri Young Members)

Friday 17 March, 6.oopm - 9.oopm

Genetics, and an understanding of DNA, is vital for scientists to understand how life on earth functions. Join us for our next For Your Inspiration event in partnership with The Genetics Society, to explore this fascinating topic and meet with scientists working in a range of different areas. This event is particularly suitable for 13+



Wasps vs snakes vs rats



Saturday 18 March, 6.00pm - 7.15pm

At this talk, three scientists will try to persuade you that the typically unloved animal they study is actually amazing. Will you be won over by wasps, swayed by snakes or roused by rats? Join us to explore the amazing behaviours of these typically unloved animals and gain a new appreciation.

This event is particularly suitable for 7+



The power of patterns



Tuesday 4 April, 6.oopm - 7.15pm

In this interactive talk we will explore the power and place of patterns in our world, via a series of exciting audience experiments. We will investigate powerful patterns we have created, patterns we've found in the world around us, as well as patterns that might well trip us up.

This event is particularly suitable for 11+



Fartology



Friday 14 April, matinee and evening shows

Stefan Gates takes you on an explosive journey through the bizarre chemistry, biology and physics behind our farts. Complex biochemistry is transformed into an hilarious adventure using massive bottoms, cannons, whoopee cushions, explosions and the world's loudest fart machine. This event is particularly suitable for 7+

See more for free at rigb.org/join

Find us

Visit the home of science in the heart of London, just a stone's throw from Green Park and Piccadilly Circus.

By tube

Green Park, Piccadilly Circus, Oxford Circus

By bus

9, 14, 19, 22 and 38

For more information on how to get here as well as opening times and public holidays visit **rigb.org/find-us**

Join the conversation

Our doors close at the end of each day, but our social media channels are open 24/7.

Challenge the way you look at the world with explosive short films and full-length talks from the world's leading scientists and writers. Subscribe to us on YouTube and follow @Ri_Science on social media.

Sign-up to our newsletter to be the first to hear about additions to our events programme and for exclusive offers at rigb.org/sign-up.

Supporters

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