Year in review
2015
Science shapes our lives, our culture and the world around us. But to ensure that science is harnessed for the maximum benefit of society today, and in the future, we must maintain a healthy and dynamic interaction between scientists and the public.

The major challenges being tackled by science today, such as climate change, the energy crisis, the eradication of diseases and unlocking the power of artificial intelligence, cannot be met by scientists alone. They pose practical, ethical and moral questions that need the creativity and support of society as a whole to answer.

This is why these topics, and more, were hotly debated at the Ri last year. We enable people of all ages and nationalities, and from all walks of life, to question, debate and ponder the wonders and applications of science.

Across our many education and heritage activities, our aim is to give people the self-confidence and critical thinking skills needed to take part in such discussions. We want every child to explore the world around them and every young person to be aware of the vast array of experiences a career in science or engineering can offer them, regardless of their gender, race, culture or background.

I'm extremely proud of how much our small and dedicated team of staff and volunteers have contributed to this ambitious mission this year and I'm delighted to have this opportunity to publicly thank them for their efforts and reflect on their achievements.

The aim of this review is to bring to light the personal stories that illustrate the depth of our impact. There are far too many to choose from, but here are just a few of my favourites that show how the Royal Institution is reaching people at home and all over the world:

— The science teacher in Uganda who ran community science activities inspired by our Experimental Films
— The plant biology university lecturer in India who uses our crystallography films in his teaching
— The head teacher of a UK primary school in a disadvantaged area who told us that our Science in Schools community show brought more parents into the school than any other activity they’ve tried before
— And the PhD student at Imperial College London who credits volunteering at the Ri as the confidence boost he needed to pursue a career in science

We achieve such depth of impact because our approach to public science engagement is as bold as it is unique. We are innovative and unafraid to experiment with different approaches. We are independent yet collaborative with organisations and companies from across all industries and sectors, not just science. And we are uniquely placed to bring cutting-edge science to a public audience and to stimulate intellectual debate on the most complex, and even controversial, issues of the moment.

I’m proud to say that our team has even bigger ambitions for the future. We want to extend our digital reach; flex our convening power to bring more debates and discussion to the public; expand our national education programmes; explore the relationship between science, culture and society further and grow our partnerships and collaborations.

After what has been a challenging few years for the Ri as we worked hard to successfully regain a secure financial footing, it is extremely heartening to see how many people, organisations and companies place real value on the benefits of the Royal Institution’s charitable activities and want to support our future. Our long-term focus is to establish sustainable funding to support our science communication and education programmes and reach our ambitious goals.

I am pleased to say we are already on our way having recently introduced a patrons and corporate members programme that is rapidly growing into a vibrant community of like-minded individuals who care deeply about opening minds to science. I’m also delighted to report that we have over 5,000 members, more than ever before in our 200 year history.

As an independent charity, we are enormously grateful for such generosity which is critical in helping us meet our mission on the national and international stage.

Please read on to learn more about the long-lasting impact of our work and we hope you are inspired to support us to continue this work for the benefit of many more generations to come.

Sir Richard Sykes FRS

Annual review 2015
CHRISTMAS LECTURES

For nearly 200 years, the CHRISTMAS LECTURES have captured the imagination and curiosity of generations of children by bringing cutting-edge science to life in a series of entertaining and inspiring shows.

Founded in 1825 with the support of Michael Faraday, one of the UK’s greatest scientists and a pioneering advocate for science education, the Lectures have been presented by many of the world’s leading scientists including Richard Dawkins, Sir David Attenborough, Carl Sagan and Dame Nancy Rothwell. In 1936 they became the first ever science programme on UK television and they have been televised every year since 1966.

Throughout their long history, the Lectures have always played a fundamental role in our mission to harness science for the maximum benefit of society.

Our aim is to encourage and support young people to observe, question and explore the world around them, and our approach uses daring demonstrations, the latest technology and hands-on participation to keep the audience spellbound.

Today, live theatre shows for 11–17 year olds and a television broadcast remain at the heart of the Lectures, but we can now inspire many more millions of people in the UK and around the world through our creative digital content, online interaction, hands-on workshops, teaching resources, media engagement and international tours.

‘Thoroughly entertaining and educational viewing!’
—Tim Peake, British ESA astronaut

‘You kept my 10 year old spellbound!’
—Parent on Twitter
‘How to survive in space’
2015 CHRISTMAS LECTURES

In December 2015, ESA astronaut Tim Peake became the first Briton in space for more than 20 years when he joined the crew of the International Space Station (ISS). Space medicine expert Kevin Fong presented the ‘How to survive in space’ CHRISTMAS LECTURES and explained Tim’s thrilling journey into orbit, explored what life is like 400 kilometres above Earth and investigated the incredible science and engineering needed to take humans as far as Mars.

Guests appearing in the three live shows, which were then broadcast on BBC Four, included astronauts Helen Sharman, Dan Tani and Mike Barrett; NASA engineer Anita Sengupta; UCL geologist Katie Joy and UCL solar physicist Lucie Green, Royal Horticultural Society botanist Alistair Griffith, medics from the Surrey & Sussex Air Ambulance; and, joining us from space, Tim Peake. Tickets for the live events were allocated in our annual ballot in September which is open to all Ri Members and UK schools.

The Lectures were produced for the BBC by Windfall Films Ltd.

Media highlights

Every year the CHRISTMAS LECTURES make the headlines in the UK and around the world.

The 2015 series generated 127 items of media coverage with highlights including television and radio appearances by Kevin on BBC Breakfast, Sky News and Radio 4’s Start the Week; interviews appearing in the Guardian, Independent, Telegraph, Metro and Wired; and features on Huffington Post and Buzzfeed.

The Lectures were also adapted for radio for the first time and broadcast to an audience of millions via the BBC World Service.

‘A place called space’
2015 advent calendar

To complement the television broadcast of the CHRISTMAS LECTURES, the Ri produces a multi-platform digital advent calendar with 24 pieces of curated content being released daily throughout December.

The 2015 advent calendar ‘A place called space’, generously supported by the Wellcome Trust, explored the human, cultural and psychological aspects of space exploration using a range of storytelling techniques including animations, astronaut interviews, short stories, spoken word poetry, interactive data visualisations, articles and demo videos.

Aimed at 18–35 year olds, the content was released via a dedicated hub on the Ri website, shared on social media via YouTube, Vimeo and Medium, and shared by popular sites such Vice, Huck Magazine and Laughing Squid.
How do the CHRISTMAS LECTURES appeal to children of all ages (and, I have to confess, to an adult in educational leadership)?

Much is straightforward classroom practice. There are explanations. Technology is used to add relevance and sophistication. Children are involved in the learning. There are practical illustrations. There is grounding in the relevant subject knowledge.

And my favourite moment? As a volunteer poured invisible carbon-dioxide over lit candles, putting them out as if by magic, a girl in the audience silently mouthed ‘Wow!’ If any of us can have that ‘Wow!’ effect, then we'll know we have chosen the right career.

For more than 20 years, the CHRISTMAS LECTURES team has travelled to Japan the summer after the original broadcast to repeat the shows for live audiences, as well as being televised on Japanese television through the support of Yomiuri Shimbun. In 2012 the Lectures went to Singapore for the first time in partnership with the Singapore Science Centre, and the Lectures appeared on MediaCorp TV.

The first televised CHRISTMAS LECTURE was on 22 December 1936, just seven weeks after the launch of the BBC’s television service. It was the first science programme on television and almost certainly the first to show scientific experiments.

In 2014, our ambition to digitise our back catalogue of the Lectures and preserve this unique scientific heritage secured essential funding thanks to the result of a public vote led by EMC Heritage Trust Project.

In 2013 Alison Woollard explored the frontiers of developmental biology in ‘Life Fantastic’. [1]
In 1978, Sir Christopher Zeeman presented ‘Mathematics into pictures’, the first CHRISTMAS LECTURES on the subject of mathematics and one which is lauded as inspiring a new generation of mathematicians, including the 2006 Christmas Lecturer Marcus de Sautoy. [2]
Young people are the decision makers, citizens and scientists of the future. How science is harnessed for the maximum benefit of society depends on their imagination, curiosity and critical thinking. This is why it is important to understand that science is not just about remembering facts for an exam. It is a creative process involving questioning and experimentation that can happen both in and outside of the classroom.

“To make choices too early and do not study enough variety, science is inter-disciplinary in the 21C”
— Luke
Ri unconference attendee

This belief underpins all our national education programmes which begin at pre-school and stretch through to primary, secondary, sixth form, university and beyond in order to foster a lifelong journey of curiosity-driven learning.

Highlights this year include the expansion of our national programme of problem-solving masterclasses in mathematics, engineering and computer science; the launch of a new national outreach programme which brings demo-packed science shows to schools and community centres across the UK; the growing impact of the Ri & UCLan Young Scientist Centre in the north west of England; and an in-depth and impassioned debate on gender and science at our unconference for young people.

‘Being from a certain background shouldn’t hold you back from pursuing what you want to do’
— Jack
Ri unconference attendee
Ri unconference

The Ri unconference gives hundreds of 16–18 year olds the opportunity to share their views and help shape the future of science policy, education and decision making.

The 2015 event “Is science a land of equal opportunities?” focused on the barriers that might exist to gender equality in science careers. We asked what actions, if any, are needed, necessary or possible to create a level playing field.

Speakers Julie Moote from Aspire2 and Yvonne Baker from the National Science Learning Centre began the day by sharing their personal views and experiences as a prompt for further debate and discussion. Student groups then presented their own thoughts and recommendations for instigating change to an expert panel.

A report capturing the young people’s findings is published in full at rigb.org/unconference

‘Gender inequality is not just a problem for STEM, but noticeably STEM is failing’
— Chloe
Ri unconference attendee

Ri Masterclasses

Our Masterclass programme opens young people’s eyes to the diversity of mathematics, engineering and computer science. Keen and talented young people all over the UK meet regularly on Saturday mornings to solve problems with top experts in academia and industry. Feedback from parents and teachers tells us that this programme increases the confidence of young people and encourages them to take on more learning opportunities in these important subject areas.

This national programme of Masterclasses draws on the support and enthusiasm of a vast and diverse network of volunteers and supporters, stretching from Aberdeen to Jersey and encompassing parents, teachers, researchers, industry professionals, university students and funders.

Highlights from 2015 include the launch of our Ri Computer Science Masterclass network, thanks to the support of Causeway Technologies Ltd, which reached nearly 1,400 young people in its first year; an innovative collaboration with the Birmingham University researchers to develop new workshops in robotics thanks to a RAEng Ingenious grant; and a successful pilot scheme, supported by the Ogden Trust, to encourage A-level students, with the help of teachers, to develop and present their own Masterclasses for primary school students.

Did you know?

British mathematician and Christmas Lecturer Sir Christopher Zeeman was instrumental in the launch of the Ri Masterclasses programme in 1981 and it has run continuously ever since.
I teach Science at Bowden House in East Sussex; a weekly residential school for boys with social, emotional and behavioural difficulties. The aim is to give students a fresh start away from their home environment. Every student has a Statement of Special Educational Needs and their difficulties are wide-ranging and complex. In addition, most come from unstable home environments. The various issues have led them to disengage from mainstream learning. Education and learning are not high on their list of needs, so the school is designed to help them re-evaluate their perceptions. Class size is small – a maximum of six students, with a high ratio of staff; never less than two, sometimes as many as four. Even with this amount of support some lessons can be extremely lively. Hence my first visit to the Royal Institution was shrouded in a degree of apprehension. However, I needn’t have worried. I have been bringing the students for several years now and they understand and know our type of students really well. They plan the session around the students and adapt it as they go, to maximise involvement and motivation. They are particularly good at noticing when concentration is waning and are swift to change the task or pace. Usually, our students have a very limited attention span which makes putting across difficult theory and concepts challenging. Yet, their recall of things they do at the Ri is beyond belief – and not just in the immediacy. Knowledge gained from these sessions remains. The students will talk about their experiences months, in some cases years, after they’ve been. Their attitude to science and behaviour in the lab at school changes – not always forever, but they certainly have more respect overall. I can honestly say that students from Bowden House genuinely benefit from their experience at the Ri. Thank you.

For L’Oréal, science is our past, present and future. At L’Oréal we are committed to building confidence in science for people of all ages, abilities, background and genders. The creation of the L’Oréal Young Scientist Centre in partnership with the Royal Institution has been testament to our commitment. We have been proud to see the impact the partnership has had in helping the next generation to think more deeply about science thanks to the excellent workshops delivered by the team.”

—Tracey Van-Tongeren, Head of Science, Bowden House School

The L’Oréal Young Scientist Centre

Since 2009, the L’Oréal Young Scientist Centre (LYSC) has provided exciting experiences in cutting-edge science for more than 52,000 young people aged 7–18 through hands-on laboratory workshops at the Ri, as well as outreach activities in the UK and internationally. Our imaginative and exploratory workshops, led by a dedicated team, aim to bring science to life in the most compelling way and offer young people from all backgrounds a fascinating insight into the reality of life as a scientist or engineer. Each workshop lasts up to six hours and has been carefully crafted to ignite a passion for scientific discovery and encourage curiosity-driven learning. The in-depth experience goes beyond the curriculum to truly transform a young person’s perception and engagement with science.

In 2015, the LYSC delivered 127 workshops at the Ri for schools across the UK and as far afield as Denmark, France, Spain and even Japan and Australia. The team also travelled to Mexico, Kazakhstan and Saudi Arabia to run workshops at festivals and conferences for young people. In total we reached 13,240 young people. Two years ago, we joined forces with the University of Central Lancashire (UCLan) to open a second Young Scientist Centre in the UK based on the successful model supported by L’Oréal in London. This new centre is located in Preston within an area of north-west England with a limited provision of science centres and museums and to date has reached more than 3,300 young people from Lancashire, Cheshire, Greater Manchester, Merseyside and beyond.

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Family learning

Science is a creative process that involves the thrill of experimentation and discovery, and we believe that all that a child needs to participate is a little encouragement to observe, question and play. Research has shown that family support is vital to nurturing positive attitudes to science [1], which is why we have developed a strong focus on family activities this year. Our exciting events, immersive workshops and confidence-building online resources act as a catalyst for families to create an environment that encourages and guides a child’s natural curiosity towards a lifelong appreciation of science.

Family Fun Days
Our Family Fun Days turn our historic London home into a giant laboratory for the day, packed with experiments and thrilling demonstrations for children aged 6–12 and their families. In 2015 we ran three events – ‘Sparks will fly’ in February inspired by the 2014 CHRISTMAS LECTURES, ‘Light’ in May, and ‘Our amazing planet’ in October. Our Family Fun Days are supported by a loyal and enthusiastic group of volunteers who generously give their time to ensure every young visitor leaves with their eyes opened to the wonder of science.

Family workshops
In 2015 we expanded our programme of Ri talks for families from three to eight and our audience grew to 3,115 from 1,010 in 2014, a 208% increase. Due to such popular demand, we have committed to significantly increase the number of family events and workshops throughout the year in 2016.

Ri Summer Schools
These innovative and interactive sessions bring to life all areas of science, mathematics, computing and engineering and are delivered by expert speakers from the worlds of academia, industry and education. Workshops are tailored to different age groups from 7–18 and the topics focus on the real life applications of the subject, such as earthquake engineering, forensic science, crash-testing, big data analysis and coding.

ExpeRimental

ExpeRimental is our series of short films that make it fun, easy and cheap to do science at home with children aged 4–10. All the experiments are designed to encourage natural curiosity and support a child-led investigation of the world around them.

In 2015, supported by the Royal Society of Chemistry, we made 10 new films to complement our 10 physics-inspired films from 2014. To highlight that ExpeRimental activities can be enjoyed by everyone regardless of scientific and social background, in 2015 we sought out new presenters living in England, Wales, Scotland and Northern Ireland, including celebrity comedian and father Rufus Hound. We made films with a Brownies pack in Northern Ireland and play workers and children at an adventure playground in London.

By sharing ExpeRimental films through the Ri website, YouTube and a dedicated Facebook page, we have reached an international audience with photos and feedback received from across Europe and as far away as New Zealand and Mexico.

‘An understanding and appreciation of science is more important than it ever was... This Institution has a marvellous record of bringing the understanding of science to children.’
—Sir David Attenborough, Ri Member and Christmas Lecturer

‘Delightful to see the speaker’s patience in chatting to younger visitors after the talk, and encouraging their future interest in science.’
— Parent

2,357
Family Fun Day attendees

92%
Ri Summer Schools sold out

1,658
Ri Summer School attendees

20
Films

596,000
Views

Case study

— Emma Nason
Science teacher, International School of Uganda

I am convinced that if from a young age, my students make a connection between ‘fun’ and ‘science’, they are more likely to have a positive outlook on science for the rest of their days. One of my searches for new and creative ways to teach science led me to the Royal Institution’s ExpeRimental.

These amazing films inspired me to run some fun science workshops with young children in my local area of Kampala. In the first week, we had a group of 30 children and parents. Together, we made massive bubbles; found out what happens when you put an acid and a base together; and explored energy conversions by making and firing rockets.

The fact that these children and parents still talk about these activities means that some of the fun was instilled in their minds. It’s my hope that they will never think ‘science is not for me’, but will instead enjoy a lifelong love of science.

**Public events**

We believe the benefits, consequences and future directions of science must be shared with the wider public. There are questions that cannot be answered by scientists alone and a diversity of viewpoints is vital.

The Royal Institution has a rich history of bringing together Nobel Laureates, cutting-edge researchers and critical thinkers from across industry, education, policy and the arts to discuss some of the major issues facing society.

The most famous science lecture theatre in the world still hosts the very best of today’s influential and intellectually stimulating conversations.

Event partners and collaborations in 2015 included the Royal Veterinary College, Science London and the Society of Endocrinology; and universities such as Bristol, Cambridge, Huddersfield, Imperial College, Kings College London, Leicester, Nottingham, Queen Mary and UCL.

In 2015 we were delighted to welcome three Nobel Laureates to present in our theatre – Serge Haroche, Adam Riess and Frank Wilczek – as well as Turner Prize winner Grayson Perry and Fields Medal winner Cédric Villani. The first Briton in space Helen Sharman; former Christmas Lecturer Richard Dawkins in conversation with BBC presenter Alice Roberts; and many more.

We collaborated with Hiscox Insurance to present an in-depth discussion on the future of arts conservation; the Royal Society of Biology for a lively debate around malaria eradication; the Genetics Society and former Christmas Lecturer Alison Woollard for a thought-provoking lecture on the ethics surrounding recent advances in genetics; and the British Psychological Society for an evening examining the question of reality and perception.

Other event partnerships and collaborations in 2015 included the Royal Veterinary College, Science London and the Society of Endocrinology; and universities such as Bristol, Cambridge, Huddersfield, Imperial College, Kings College London, Leicester, Nottingham, Queen Mary and UCL.

92% of attendees either agreed, or strongly agreed that they enjoyed the event

91% of attendees say they learnt something new

82% are inspired to find out more about the subject

In March 2015, Fields Medal winner Cédric Villani took us on a fantastic adventure through the beautiful, mysterious world of mathematics. This Ri Talk has been watched 67,000 times on the Ri's YouTube channel. [1]

In October 2015, marine biologist Helen Scales presented a talk on the spiralling world of seashells and the bizarre animals that make them. [2]

‘There’s something magical about presenting scientific ideas to audiences in the Royal Institution’s famous lecture theatre. Having curated a series of evening events on quantum biology, I was delighted, but not surprised, by the huge turnouts as well as the many insightful questions the audience members, both young and old, asked. It always feels as though both lecturer and audience become part of an enduring and unique cultural experience that stretches back over two centuries.’

—Jim Al-Khalili

Did you know?

Our Discourse series began in 1825 and has welcomed some of the greatest scientists and cultural commentators to share their research and opinions with the public ever since. These include J.J. Thomson who revealed the existence of the electron in 1897, science fiction author H.G. Wells who contemplated the future in 1902, and Kathleen Lonsdale who advocated for more women in science in 1970.
Digital engagement

Our approach

The Royal Institution has always been at the leading edge of using the latest technology to communicate science to the public. Two centuries ago, this was through publishing lectures in journals and we own audio recordings on wax cylinders dating back almost a hundred years. Today, digital technology is transforming how people of all ages and backgrounds communicate.

We are embracing this fast-paced, ever evolving medium; experimenting with it to bring science to life in new and surprising ways; and embedding it across everything we do in order to open up our work to a truly global audience.

Our ambition is to build on our growing reputation as a leader in digital science communication through an expert-led approach of in-depth research, analysis, collaboration and experimentation.

‘The International Year of Crystallography in 2014 was considered to be important for the history of British science and for highlighting the enabling role that STFC facilities play. It provided STFC with a unique opportunity to contribute to a high quality on-line project that was timely. The subsequent impacts from the project reinforce the excellence of the Royal Institution’s work.’
— Ian Fuller, STFC

‘Fab video! I often struggle to communicate this idea to others but you made it very easy to understand.’

‘I love this channel… I can’t attend those lectures, so it’s amazing to watch it from home!’

‘Such a clear presentation of the difference between Newton’s view of gravity and that of Einstein! I am a school level Physics teacher in India and am going to use this.’

— YouTube subscribers

Our reach

In five years we have grown to become the largest YouTube channel of any UK museum or science organisation with over 200,000 subscribers.

It is a truly global audience with only 11% from the UK, 38% from the United States and the remainder spread across 220 other countries and territories.

With the support of YouTube volunteers, Ri films have now been translated into Dutch, French, German, Indonesian, Italian, Polish, Portuguese, Russian and Spanish. And it is a loyal and engaged audience. Our collection of 377 films has received more than 18 million views – the equivalent of 222 years of content watched – and each video is viewed more than 70,000 times on average.

On top of this, the popularity of our hour-long Ri Talks are defying commonly held assumptions about the fleeting manner in which people engage with online content.

Our award-winning ‘Celebrating Crystallography’ animation, produced with funding from STFC and support from 12foot6, is one of seven unique animations created for the Ri Channel and YouTube.[1]

Our most popular YouTube film is ‘Levitating superconductor on a Mobius Strip’ from our Tales from the Prep Room series which has been watched more than 1.8 million times on the Ri Channel and YouTube.[2]
Our collaborations

Our digital output covers a multitude of platforms and formats and is delivered by an in-house team which includes film producers and editors, science presenters, graphic designers and social media experts. Our content pushes the boundaries of conventional science communication, and so we seek out like-minded creative and innovative individuals from all sectors to collaborate with.

We want our content to reach as broad and diverse an audience as possible, which means we do not expect all of our viewers to come to us. Instead, we reach out to them on sites they already visit. This is particularly important for people who may not consider science as an area of primary interest or relevance. In 2015 this approach led to Ri films being featured on news sites such as the Guardian, the New York Times, Huffington Post and the Australian; debated on online discussion forums such as Reddit; and highlighted on cultural sites including BrainPickings.org, Aeon.co and OpenCulture.com.

We shared content with other education providers through sites like Biblio, as well as charitable projects such as Wayout TV which provides specially curated video content to offenders in two prisons in the east of England.

A partnership with the Science and Technology Facilities Council (STFC) to produce a video collection celebrating 100 years of crystallography in 2014 resulted in a European Science TV and New Media Award for one of our animations. This success was the catalyst for us to launch an annual animator-in-residence programme in 2015 to help us maximise the potential of this creative medium to engage new audiences with science, to breathe new life into material from our extensive archives, as well as nurture new talent in the field.

Case study

— Andrew Khosravani, RI animator-in-residence in 2015

I have always had a keen interest in science but, having come from an art school background, had never previously worked on science-based content. I found it not only fascinating, but a viscerally visual content to work with. Every time I started a new project I was excited to begin researching and with such an unbelievable archive available at the Ri, there was a constant bombardment of inspiration to be found.

The animator-in-residence post is a dream job for any up and coming animator as it allows you the time and space to produce work on fascinating subject matter in such a creatively free environment. In a world that often demands a great deal without giving you scope to experiment and explore, this residency is invaluable.

Our impact

Producing high quality, popular content is important to us, but understanding the lasting impact our work has on our viewers in terms of attitude change and learning is just as important.

Over the last two years we have commissioned and run an in-depth research project involving Pro Bono Economics and Professor Justin Dillon and Dr Amy Seakins of King’s College London to better understand how and why our audiences engage with our videos. We now have a better analytical framework to determine whether we are achieving our objective of encouraging our audience to think more deeply. This provides a strong foundation from which to continue our critical thinking in this field.

We share our findings in the digital sphere with our peers to ensure our efforts make a lasting contribution to the evolution of science communication more broadly. In 2015, we hosted a seminar for UK experts in science communication and education research, and Ri representatives were invited to share our digital expertise at the Gothenburg Science Festival; BIG, the skills sharing conference for science communicators; the UK Museums on the Web conference; and STEMPRA’s annual training day for press officers.
Our heritage

Celebrating the bicentenary of the miner’s safety lamp.

Firedamp, an explosive gas now known as methane and found in coal mines, caused the deaths of tens of thousands of miners, who until 1815 could only use open flames to light their way.

Sir Humphry Davy, Director of the Laboratory at the Royal Institution, solved the problem in December 1815. He discovered that flame would not penetrate metal wire mesh, meaning that any explosions would be safely contained if a candle was surrounded by a cylinder of metal gauze. This was the invention of the miners’ safety lamp and first tested successfully on 9 January 1816.

To mark the bicentenary in 2015, Frank James delivered a Discourse in our famous theatre, we created a film for our popular Tales from the Prep Room series on Youtube and we partnered with ArchAlive Ltd to publish Davy’s volume of manuscripts tracking the development of the lamp.

‘The significance of Davy’s lamp cannot be understated. Not only did it save countless lives, it also increased coal production by allowing the exploitation of deep coal seams previously too dangerous to mine. Davy’s lamp was thus crucial to continuing industrialisation in the nineteenth century.’

—Frank James, Ri Professor of the History of Science
Science at home

Our national reach

In 2015 we shared the wonders of science with millions of people of all ages and backgrounds across the world.

### Ri Masterclasses
- **Mathematics (primary)**
  - Berkshire
  - Cambridgeshire
  - Devon
  - Essex
  - Gloucestershire
  - Greater Manchester
  - Hertfordshire
  - Kent
  - Lancashire
  - Norfolk
  - Somerset
  - Surrey
  - Sussex
  - West Midlands
  - Yorkshire

- **Mathematics (secondary)**
  - Aberdeen
  - Bedfordshire
  - Berkshire
  - Bristol
  - Cambridgeshire
  - Carlisle
  - Cornwall
  - Devon
  - Edinburgh
  - Essex
  - Glamorgan
  - Glasgow
  - Gloucestershire
  - Gwynedd
  - Hampshire
  - Hertfordshire
  - Jersey
  - Kent
  - Lancashire
  - Leeds
  - Leicestershire
  - Liverpool
  - Manchester
  - Norfolk
  - Oxfordshire
  - Sheffield
  - Somerset
  - Staffordshire
  - Stirling
  - Suffolk
  - Surrey
  - Swansea
  - Teesside
  - West Midlands
  - Worcestershire
  - Yorkshire

### Computer science
- Bedfordshire
- Essex
- Exeter
- Lancashire
- London
- Sheffield
- Surrey
- Sussex

### Science in Schools
- Birmingham
- Bolton
- Cambridge
- Kent
- London
- Penzance
- Peterborough
- Stockton-on-Tees
- Surrey

### L’Oréal Young Scientist Centre outreach
- Birmingham
- Cheltenham
- Norwich
- Minehead
- Preston

### ExpeRimental presenters
- County Armach
- London
- Motherwell
- Swansea
Our international reach

Education and heritage outreach

- Argentina
- Australia
- Belgium
- Brazil
- Canada
- Cyprus
- Czech Republic
- France
- Germany
- Gibraltar
- Greece
- Republic of Ireland
- India
- Japan
- Jersey
- Luxembourg
- The Netherlands
- Oman
- Poland
- Qatar
- Spain
- South Africa
- Switzerland
- Ukraine
- UK
- USA

International YouTube audience

- USA 2,967,575 (38%)
- UK 872,409 (11%)
- Canada 432,642 (5.5%)
- Australia 296,952 (3.8%)
- Germany 291,448 (3.7%)
- India 216,443 (2.7%)
- Netherlands 157,843 (2.0%)
- Brazil 133,570 (1.7%)
- Sweden 126,742 (1.6%)
- Poland 105,269 (1.3%)
- France 103,527 (1.3%)
- Italy 84,969 (1.1%)
- Philippines 76,602 (1.0%)
- Denmark 76,074 (1.0%)
- Mexico 74,921 (0.9%)
- Norway 69,662 (0.9%)
- Spain 69,514 (0.9%)
- Singapore 67,890 (0.9%)
- New Zealand 65,479 (0.8%)
- Malaysia 64,214 (0.8%)

youtube.com/TheRoyalInstitution
Our community

Ri Members

Ri Members have been at the heart of the Ri since 1810 and we are proud that membership has always been open to all. Their financial support, advocacy for our work and personal passion for sharing the wonders of science are vital in helping us deliver our mission.

Today, our community is made up of over 5,000 Ri Members, more than ever before from all corners of the globe. We offer a range of unique opportunities to people of all ages, our youngest member is four years old and our oldest is 95.

Did you know?

Famous past Ri Members include landscape painter John Constable, civil engineer Isambard Kingdom Brunel, journalist and founder of Reuters News Agency Paul Julius Reuter, physicist and suffragette Hertha Ayrton, and violinist and conductor Yehudi Menuhin.

‘The Royal Institution is the Wembley, Twickenham and Lords of science. Every time I go to an event there the atmosphere and the history of the place is truly inspiring.’
— Ri Member

‘I like coming to the Ri because it’s a fun place to be!’
— Ri Young Member

To find out more about Ri Membership please visit rigb.org/join or contact our Membership team on 020 7491 6588 or membership@ri.ac.uk

Feedback from Ri Members

In 2015 we invited our members to share their thoughts on why they chose to become an Ri Member, what they value about being part of our community and how it could grow and evolve in the future.

Here is a snapshot of what they told us.

Why are you an Ri Member?
• Knowing that my financial support helps, in a small way, to help the Ri further its mission, which in my view is as relevant today as it was in Faraday’s time
• To meet interesting people
• I enjoy being part of a prestigious institution with such a historic background
• To encourage my children’s interest in science
• To see, hear and meet with inspirational speakers

What do you value about your membership?
• I like the sense of living history about the Ri
• Belonging to a great institution that is recognised world wide
• To be part of and help support an organisation that has been at the forefront of scientific education and the advancement of science for over 200 years.
• The chance to give science a more prominent position in society
• The ease of attending presentations in the greatest lecture theatre on the planet
• I very much enjoy sitting in the lecture theatre, knowing of the eminent scientists that have presented their work there
• Having my brain stretched

As a result of this feedback from members
• Ri Member discounts on events and exhibitions at leading science and cultural institutions including the Natural History Museum and the Science Museum
• Pre-Discourse drinks receptions for Ri Members to meet and socialise
• An expanded family programme of events with more Saturday and Sunday workshops and more Summer Schools sessions
• A new café in the Ri Atrium
• Increased resources within our Membership team to provide a more efficient and dedicated service

And we are hard at work bringing to life many more ideas to help broaden our offer to Ri Members in London, across the UK and abroad.
Supporters, Corporate Members and Ri Patrons

Our supporters are a group of our closest advocates who help us inspire people to think more deeply about the wonders and applications of science. They provide a vital source of income that supports a whole range of core activities across the Ri.

This vibrant community is made up of individuals, companies and organisations from a diverse range of backgrounds including business, academia and culture.

In return for their generosity, our supporters receive access to exclusive events; behind-the-scenes tours; and the opportunity to attend our annual Faraday Dinner with eminent speakers.

With their support we provide high quality public science events to thousands of people each year; are able to extend the reach of the Christmas lectures to many more schools and families and grow our digital and outreach programmes to ensure every young person has the opportunity to experience a positive interaction with science.

Thank you to the Wellcome Trust, Schlumberger, Raspberry Pi Foundation, the UK Space Agency and the European Space Agency for their generous support of the 2015 CHRISTMAS LECTURES. [1]

Here three of our Corporate Members explain why they chose to support the Royal Institution.

‘As a long-standing supporter of the arts and science, Hiscox is proud of its association with the Royal Institution. The Royal Institution’s founding principles of discovery, innovation and communication resonate with Hiscox’s approach to risk assessment as a specialist global insurer. And as a specialist fine art insurer, the impact of scientific and technological developments on the art market is of particular interest.’
— Hiscox

‘As one of the UK’s leading employers in the defence sector, we recognise that science should be open and accessible to all, both to improve public understanding, and to inspire and engage the next generation of scientists and engineers. Through the Royal Institution’s expertise in web-based resources for teachers and the RI Engineering Masterclass programme, we have been able to build on our schools outreach activities and provide new and exciting opportunities for graduate development. AWE is proud to support the mission of the Royal Institution.’
— AWE

‘Corporate membership of the Royal Institution demonstrates the Advanced Propulsion Centre’s ambition to continue the great traditions of world-leading science and engineering in the UK, and to build on the legacy of Michael Faraday and others to ensure that the next generation of British engineers and scientists deliver world-changing technologies.’
— Advanced Propulsion Centre

Michael Faraday (1791–1867) is one of the most significant and famous scientific figures of British history, having radically transformed our understanding of the world with the discoveries he made in his basement laboratory [2] of the Royal Institution. Coming from a humble background, Faraday was a leading advocate for public science education and our supporters make it possible for us to continue his legacy today. [3]

Find out more about becoming an Ri Patron or Ri Corporate Member at rigb.org/support
Our supporters

We would like to extend a huge thank you to our trustees, donors, corporate supporters, patrons, members and visitors. As an independent charity we rely on your support to provide a platform for the public and young people to think more deeply about science and in turn help us to harness science for the maximum benefit of society.

We are extremely grateful and look forward to continuing to inspire a love of science with you.

Major Supporters
The Clothworkers’ Foundation
L’Oréal UK & Ireland
Causeway Technologies
The Doris Pacey & Dr Michael and Anna Brynberg Charitable Foundations
Welcome Trust

Trusts and Foundations
A G Manly Charitable Trust
The Brian Mitchell Charitable Settlement
The British Psychological Society
The Charles Hayward Foundation
The Company of Actuaries
Charitable Trust Fund
D G Marshall of Cambridge Trust
The DS Smith Charitable Foundation
EMC Heritage Trust Project
The Equitable Charitable Trust
The ERA Foundation
Farraday Foundation
The Genetics Society
The Gibbons Family Trust
G M Morrison Charitable Trust
The Holback Charitable Trust
The John Apticorp Charity
The MacRobert Trust
The Reece Foundation
Science and Technology Facilities Council
The Shears Foundation
Society for Endocrinology
The Sonandrise Foundation
UK Space Agency
The Wixamtree Trust

Corporate Supporters
Ernst & Young LLP
QuantumBlack
Raspberry Pi Foundation
Schlumberger

Corporate Members
quipoints Technology Services
Advanced Propulsion Centre UK Ltd
AWE plc.

In-kind supporters
Thank you to our in-kind supporters who provide us with valuable support on a variety of projects.

RI Patrons
Faraday Circle
Ms Catherine Roe
Mrs Fiona Forbes and
Mr Jonathan Hescox
Mr Hugh J W Harper
Master Monty Le Fay
The Parafady Foundation
The De Lacaso Foundation

Diffusion Circle
Sir Desmond Pitcher
Mr Renato Lulua-Jacob
Mr Simon Godwin
Dame Theresa Sackler
Mr Nicholas and
Master Tobe Aleksander

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Mr Hank Roberts
Mr James Rowe
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Mr Ron Walker
Mr Sam Bell
Mr Santos Asin
Dr Shahpur Pateli
Mr Stephen Brown
Eur Ing Steve Nimmons
Dr Stuart Blackie
Prof Tony Eccles
Mr William Morris

If you would like to find out more about how you can get involved, please contact the development team at development@ri.ac.uk or visit rigb.org/support

Help us open minds to science

It is only with the help of our generous patrons, supporters and members that we can continue to open minds to science. We have reached a significant point in our history as we seek to extend our reach on the national and international stage. But with no government funding, we rely entirely on the generosity of our supporters to help fund all that we do.

Become an RI Patron
Deepen your engagement with the RI and join a group of philanthropic individuals who help open minds to science. There are four levels of patronage starting at £150.

Become an RI Member
Join a community of like-minded people who share a curiosity and passion for science and enjoy a range of annual benefits. Membership starts at £29 for children and £75 for adults.

Support a project
The RI has a range of educational programmes for young people from the CHRISTMAS LECTURES, Science in Schools programme to a national programme of Mathematics, Engineering and Computer Science Masterclasses for highly talented students. We have an ambition to extend the reach of these programmes nationally.

Corporate support
Corporate supporters benefit from access to leading thinkers, RI Patrons and peers through exclusive invitations to corporate networking events, brand association with our outreach programmes and exposure within the scientific community. Our packages can be tailored to the needs of your company.

Leave a legacy
The RI welcomes support from generous individuals. By leaving a legacy to the RI you will help us plan for the future and support our innovative education programmes for years to come.
Our finances

Today the Royal Institution is reaching a larger and more diverse audience, with whom we are engaging more deeply than ever before. Whilst it was a challenging financial year, we continued to deliver this high level of charitable impact through the generous support of our donors and the dedication and commitment of our staff and trustees.

As an independent charity the Ri relies entirely on self-generated income to carry out our charitable activities. We have invested in our organisation in order to deliver these activities in a financially sustainable way.

Last year we generated £1.9 million in trading income and approximately £1.7 million in voluntary income through fundraising, membership and event income. In addition to this, in December 2015 a lease premium of £1.5 million was received for part of 20 Albemarle Street and £974,000 was raised from a sale of non-core assets.

This income was used to fully repay debt and supplement cash reserves. Cash reserves are now strong, with a positive balance exceeding £1.6 million at 31 March 2016. This puts us in a strong position to focus on longer-term fundraising as we move forward with our ambitious plans.

Full audited accounts are available to download from the Ri and Charity Commission’s websites.

How we fund our work

Total income 2014–15: £3.6m

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>Fundraising</td>
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<tr>
<td>Event income</td>
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<tr>
<td>Membership</td>
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<tr>
<td>Trading</td>
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</table>

How we spend our money

Total expenditure 2014–15: £3.9m

<table>
<thead>
<tr>
<th>Category</th>
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</thead>
<tbody>
<tr>
<td>Education programme</td>
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<tr>
<td>CHRISTMAS LECTURES</td>
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</tr>
<tr>
<td>Heritage</td>
<td>£0.4m</td>
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<tr>
<td>Public events</td>
<td>£0.5m</td>
</tr>
<tr>
<td>Trading</td>
<td>£1.4m</td>
</tr>
</tbody>
</table>

Our governance

The Royal Institution was founded in 1799 and received its Royal Charter on 13th January 1800. It is an independent Royal Charter Charity and is governed by its byelaws and governing documents.

The Trustees number eleven in total, nine elected by the membership of the Ri and two appointed by the Board. The Chief Executive is appointed by and responsible to the Board of Trustees. The Trustees have overall responsibility for managing the business of the institution; setting objectives and policy guidelines; safeguarding the Institution’s assets; overseeing all significant capital expenditure; and establishing and maintaining relevant policies. The Board meets a minimum of four times a year and is supported by the Audit Committee, Finance Committee and Nominations Committee.

Royal Patron
Her Majesty The Queen

Vice Patron
HRH The Prince of Wales

President
HRH The Duke of Kent

Honorary Vice President
Sir John Ritblat

Trustees
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Prof Julia Buckingham
Hugh Harper
Lord Julian Hunt FRS
Dr Martin Knight
Prof Sir Peter Knight FRS
Sarika Patel
Prof Chris Toumazou FRS
Lord Robert Winston

Senior Management Team
Chris Rofe
Chief Executive
Prof Gail Cardew
Director of Science and Education
Michael de Crespigny
Director of Finance
Claire Gardner
Director of Commercial Operations

Please visit our website for full details of our governance rigb.org/about/organisation

Registered Charity number 227938

[38] The Royal Institution

‘Help us open minds to science’

—Gail Cardew
Professor of Science, Culture and Society and Director of Science and Education