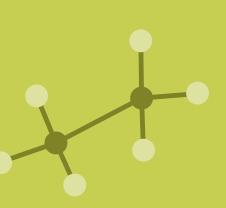


### **The Royal Institution**Science Lives Here

**Annual Review 2019** Open here for science

Ri Annual Review 2019 01







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### Welcome

At the Royal Institution, we believe that science is transformative. It shapes the world around us. Our futures depend on the application of science being informed by those it is intended to serve. It follows that our mission – to create opportunities for everyone to discover, discuss and critically examine science – is more important than ever before.

So we are pleased to report that over the past 12 months we have grown our size, our reach, and our capacity to do more.

We have increased the number of activities we offer to encourage everyone to think more deeply about science. The number of Ri Members has grown for the fifth year in a row. We have provided more free activities to schools, allowing a greater diversity of young people to engage with us. And we have expanded our reach, not least through digital activity, adding 185,000 subscribers to our YouTube channel and reaching new, younger audiences through social media.

We have signed major partnerships, such as with the Lloyd's Register Foundation to establish an international public engagement network to promote cooperation between the public and organisations undertaking research, and with the Financial Times to bring their wonderful 'Masters of science' series to life in our equally wonderful theatre.

We have invested in our staff, recognising their expertise and passion as the cornerstone of our success. That 25% more people work at the Ri today than a year ago, is a significant step forward in our strategic ambition to double our capacity. Over the summer, our staff worked together to develop four new value drivers at the Ri: Do science, Dare to question, Demand diversity and Discover together. And we have maintained our financial performance, posting a surplus for the fourth year in succession.

So as we move forward into the second year of our ambitious strategy, the Ri goes from strength to strength. Two hundred and twenty years after our foundation, we remain at the centre of public engagement with science. We continue to grow as an organisation. And even more people have begun, or maintained, a lifelong journey with science through the Ri.

Our thanks must go to all those – our staff and volunteers, our Trustees, our Ri Members and Patrons, and our many, many charitable supporters – who have made this year of success possible.



**Sir Richard Sykes** Chairman



**Dr Shaun Fitzgerald**Director



### Do science

### Live science, love science, science science

We do science at the Ri. We love science, we live science and we science science. We'd love everyone to feel the same, but we know that there are many who feel science is irrelevant to their lives.

Yet as we showed in the 2019 CHRISTMAS LECTURES, science is present in pretty much every aspect of our lives. It has the power to transform our world, for the good and the not so good. And if we can't convince everyone to love science, then at the very least we can demonstrate its power and encourage everyone to raise their voice about how it is used in their lives.

Throughout the year our adult events, our educational outreach, our YouTube channel, our heritage and our family activities have created opportunities for people of all ages and backgrounds to discover, discuss and critically examine science and the way it shapes the world around us.



# Talking science with the world

In 2019 we again welcomed a broad mix of scientists, authors and commentators, to talk science with thousands in our famous theatre.

From the UK's most experienced forensic investigator, Dame Sue Black, to best-selling primatologist Frans de Waal, over 150 speakers graced our stage. All brought unique research findings and viewpoints. All were united by their status as world leaders in their field. And all provided the critical examination of science that regulars at our talks have come to expect from an evening at the Ri.

We helped the Genetics Society to mark their centenary with a series of high-profile events, and partnered with the Financial Times to bring their 'Masters of Science' series off the pages and live into our theatre. We also ran a series called 'The batteries are coming' kindly supported by the Faraday Institution. These and other partnerships helped to bring new audiences and greater diversity to the Ri.

We exceeded 100 theatre talks for the second year in a row. Our short courses – cosmology, particle physics and quantum physics – were all sold out. And we grew our adult theatre audience by nearly 20% year on year, with the number of people attending a talk at the Ri rising to just under 24,000.

And then we took the same mind-blowing, thought-provoking content to an audience of *hundreds* of thousands more across the world, through our ever-growing YouTube channel. Fifty-three talks and 35 accompanying Q&As, 20 series of past CHRISTMAS LECTURES, two wonderful animations and more, all contributed to the 130 videos we produced during the year. We added 185,000 new YouTube subscribers – an increase of more than 40% – and saw our videos viewed 21 million times, versus 15 million the year before.

Substantial increases in our Twitter, Facebook and Instagram followers helped us reach a new, younger and more diverse audience.

Our free museum welcomed over 67,000 visitors during the year, all enjoying our internationally significant collection. Our Heritage Team conducted tours of the Ri for over 900 people and continued to provide expert advice to broadcasters and scientific organisations including the BBC and the Discovery Channel. We lent items from the Ri collection to the Science Museum and the Bristol Art Gallery, among many others.

And in July, we completed our assessment of the archival collections, kindly funded by the Charles Hayward Trust, securing the future of some of the more fragile paper documents in our care.

It is this combination of high-quality science, speaker expertise, our unique heritage, and digital platforms through which we will continue to be known as 'the Wembley of science communication'.



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## Secrets and lies

The CHRISTMAS LECTURES are a prime example of how we 'do science' at the Ri. Always more than a body of knowledge to be learnt, they are a demonstration-led exploration of the scientific process. Pacey, thought-provoking and topical, watching the CHRISTMAS LECTURES has been a family tradition for over 50 years.

And in our world of 24/7 entertainment and multiple media channels, we understand that they need to evolve to keep pace with our young audiences' viewing habits.

In 2019, we put maths under the spotlight, with Hannah Fry revealing how a hidden layer of numbers drives our everyday lives in power ful and surprising ways. From the minute differences between winning and losing in elite sport, to the realities of keeping driverless cars on the road (and off the pavement), Hannah was our expert guide to the delights of this 'most glorious playground'.

But by asking big ethical questions — do computers have too much control over our lives? Is it right that AI can decide who lives or dies? — Hannah showed how our unwavering faith in numbers may lead to disaster.

It's our responsibility to ask the questions, but we know it's not for us to come out for one side or another. Our young audience is perfectly capable of deciding for themselves, if there are problems science shouldn't be allowed to solve.

As ever, we must extend our thanks to the 2019 CHRISTMAS LECTURES major supporter, the Lloyd's Register Foundation, and our community of CHRISTMAS LECTURES supporters, KPMG, Schlumberger and UKRI.



## Twitter takeover time

It was twitter takeover time at the Ri this year, with biochemist Alex Lathbridge and artist and science communicator Hana Ayoob both being handed the reins to our biggest social media channel. With Alex's 2018 takeover described as a 'thing of beauty', we were keen for a repeat.

Social media takeovers introduce us to a new audience by tapping into the guest host's own followings, while meeting one of our strategic objectives to support the outreach of scientists and science communicators.

Hana Ayoob's takeover also involved two days in charge of our Instagram account, in the run-up to the main event on Twitter. She shared her illustrations and struck up conversations with people about the relationship between science and art. As one follower put it, the two are 'identical twins with different personalities', a sentiment that summed up much of the engagement.

Over the three days with Hana at the helm, we averaged 242 likes per day, versus a normal November average of 167. Her tweets received over 141,000 impressions in a single day; our highest performing day of the year. But the most heartening statistics – eight times as many replies as normal and seven times as many comments – demonstrated the increased engagement with our channels.

We have worked hard this year to increase our following across all social media channels, bringing a new and more diverse audience to the Ri. In the year ahead we will seek more opportunities to increase our following, while supporting the voices of more scientists and science communicators.

'Discovered the @Ri\_Science YouTube channel a couple of days ago and I must say it is the best thing I've found on the internet in ages!'

Ri YouTube subscriber





## Dare to question

### Keep listening, keep learning, respect everyone

One of our four new values – developed this year by everyone at the Ri – compels us to dare to question. To keep listening and to respect everyone, but to question nevertheless.

It's a value that aptly reflects the spirit of our charitable purpose. Through our educational outreach we are encouraging enquiring young minds, helping pupils to appreciate that science isn't just answers we already know, but rather a series of questions to be asked.

Kindly supported by EY, our annual Youth Summit saw hundreds of teenagers grapple with the complex viewpoints of single-sex toilets in schools. Our schools Debate Kit asked young people to debate the ethics of driverless cars, including whether AI should have the power to decide who lives or dies. And in the 2019 CHRISTMAS LECTURES, we encouraged our audience to question the trust we place in maths.

That questioning spirit, a refusal to be complacent in accepting everything science tells us, applies equally to our discussions around the place of science in society. In October, we signed a historic agreement with the National Education Union, to work together to promote science teaching in schools, including questioning policy makers on areas of mutual interest. And in November we again partnered with the British Science Association to host their annual Huxley Summit, putting businesses and policy makers on the spot around solutions to tackle the climate crisis.

At the Ri we do not presume to hold all the answers. But we are certain of our responsibility to ask the questions; of scientists, businesses and policy makers, and of ourselves. Our vision is to see everyone think more deeply about science and its place in our lives.

'@Ri\_Science's recent youth summit was done really well and the kids were having fascinating conversations about religion, race, class, gender & more.'





# Demand diversity

### Open doors, promote inclusion, work quirky

We are well aware that our historic home in the heart of Mayfair is imposing. That our status as a scientific institution may make us seem unwelcoming to many of the audiences we are seeking to engage. Yet we have always been open to all and we are intent on welcoming all.

In 2019 we were more mindful than ever before of the need to become more accessible for our broader audiences.

We placed 'Demand diversity' at the centre of the Ri as another of our four new values. We continued to broaden the scientific and cultural topics discussed in our theatre, and ran more events celebrating the contribution to science of under-represented groups. Thanks to the generosity of the Lloyd's Register Foundation and KPMG we were able to offer more free Science in Schools shows and more free tickets to the CHRISTMAS LECTURES, for schools that benefit from additional support.

We developed our Instagram account to reach a younger audience. We relaxed the 200-year old dress code for our Discourses. And our staff, for whom inclusion is important, took their own decision to form an Equality, Diversity and Inclusion Group at the Ri.

These are small steps, but we will build the momentum in the year ahead, and the next, and the next. We are demanding diversity at the Ri, because a product of the wonderful difference in us all is a diversity of viewpoints. And a diversity of views – and voices – is crucial if science is to be informed by everyone in society.

**Below left:** 'Diversity challenge'

**Below:** Chris Jackson's YouTube Lecture on volcanoes



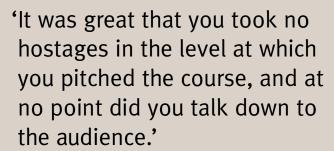
**VOLCANOES** 

Ri

Ri Annual Review 2019

## Open here for science...

The numbers tell us that our activities and reach grew again in 2019. And it's our feedback that tells us those activities are having an impact.



Ri workshop attendee



2.3 million viewers enjoyed the 2019 CHRISTMAS LECTURES during broadcast and on catch-up.



### **Science in Schools**

7500

We reached 7500 more children through 155 Science in Schools shows, a year-on-year increase of 15%.



### YouTube

42%0

We grew our YouTube audience by 42% with 185,000 new subscribers, and our videos were watched 21 million times versus 15 million in 2017/18.



'The Ri is extremely important to children, girls especially. My girls feel apart a lot of times as not many of their peers share their love of science and maths. The Ri is a place where there are so many strong role-models which inspire them.'

Family Programme attendee

Theatre audience

24k

The audience for our public programme grew by nearly 20% with just under 24,000 people enjoying an evening talk in our theatre.

Family events

JUU

Over 9000 people took a trip to the Ri for one of our 130 family events.



of 11% versus 2017/18 and during 2019 the 100,000th student successfully completed our programme.

Something new \*\*

When asked, 88% of public event attendees said they learnt something new and 76% said they felt more confident about the subject as a result.

'The CHRISTMAS LECTURES by @FryRsquared were a masterclass in mathematical communication. Expertly planned, fast-paced and totally engaging, their clear message is that maths is powerful, vital, applicable to almost anything, for everyone.'

**CHRISTMAS LECTURES viewer** 



# Discover together

### Spark minds, fan flames, maintain wows

Wow is what we do at the Ri. We are well known for our mind-blowing talks and our explosive demonstrations. But we also know that a one-off wow is not enough if we want to encourage a lifelong journey with science. Evidence shows that repeat engagement is far more effective than individual opportunities, however inspirational.

And we believe that a lifelong journey begins best with children and young people, discovering science together, with their friends, their families, or like-minded peers.

So our educational and family activities are designed to spark minds, then fan the flames, and ultimately, to maintain the wows.



# Sparking curious young minds

We're never more curious than when we're young. And when it comes to science and the world around us, there's no better way to meet that curiosity than one of our engaging, and often explosive, family activities.

Throughout the year our expanding Family Programme offered more opportunities than ever before to nurture and grow a love of science in young people; with their parents exploring and discovering science right alongside them.

Over 9000 people came to one of 130 family events at the Ri in 2019, a slight increase on the 126 events in 2018. Nearly half of these enjoyed one of our regular theatre shows, hearing first-hand from scientists of every description, authors, and even the odd former Christmas Lecturer or two. Thousands more loved our three Family Fun Days, which remained as popular as ever. And we introduced 'For your inspiration', a new careers-focused series kindly supported by the Royal Society of Chemistry, giving teenagers the chance to hear exactly what it's like to work in science, direct from experts in the field.

We again took the Ri family experience on the road, performing headline shows at the Big Bang Fair and the Cheltenham Science Festival, as well as providing two hands-on workshops at the annual British Interactive Group (BIG) event, for our colleagues working in the field of science communication.

Our thanks must go to the dozens of regular volunteers who give their time and expertise so freely, to make our Family Programme so popular, something our dedicated Family Programme team (of two!) couldn't do alone. And our congratulations must go to our very own Jemma Naumann, who won the inaugural 'Over-Ambitious Demo Award' at the Cheltenham Science Festival and followed it up by winning the prestigious 'Best Demo Award' at BIG.

We look forward to welcoming even more curious young minds to our award-winning family shows and activities in the year ahead.



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# Creating a buzz of excitement

For enthusiastic school children, from Truro to Aberdeen, Saturday mornings are Ri Masterclass mornings. This year, we ran 1000 sessions, an 11% increase on the previous year, engaging over 6500 pupils with an in-depth examination of engineering, maths and computer science. We increased choice with new sessions, including the Kantor Primary Mathematics Masterclass programme generously funded by the Kantor Charitable Foundation, and a new robotics Masterclass with the kind support of the National Centre for Nuclear Robotics. In February, the 100,000th student successfully completed the Masterclasses programme.

Our L'Oréal Young Scientist Centre was fully booked in 2019, as it is year after year. We ran over 180 sessions of high-impact laboratory science experiences, for over 5000 children of all ages and backgrounds. And in September, we marked the 10th anniversary of our partnership with L'Oréal. Many of the 120,000+ pupils we have reached may be working today as lab-based researchers themselves. To mark this lasting legacy, in the year ahead we will develop new LYSC workshops on the theme of sustainability, mirroring our young people's own commitment to do more for the environment.

For primary school pupils our Science in Schools programme inspires a sense of wonder and excitement; for secondary it sustains or re-energises a passion that may have waned. For all it creates an opening to the possibilities of science, that skilled teachers can exploit for the children's benefit. In 2019 we created a buzz of excitement among over 57,000 school children and gave invaluable CPD training to 2000 science teachers. We also increased the number of free activities, in 78 schools, an increase of over 300% versus the year before. Over half of the schools were in the 20% most deprived areas of the UK.

Teachers and parents tell us that the outcome of our educational activities is increased confidence and a willingness to learn more. And we can tell, from the children's own feedback, that what makes a difference is discovering together with others who share their love for science.



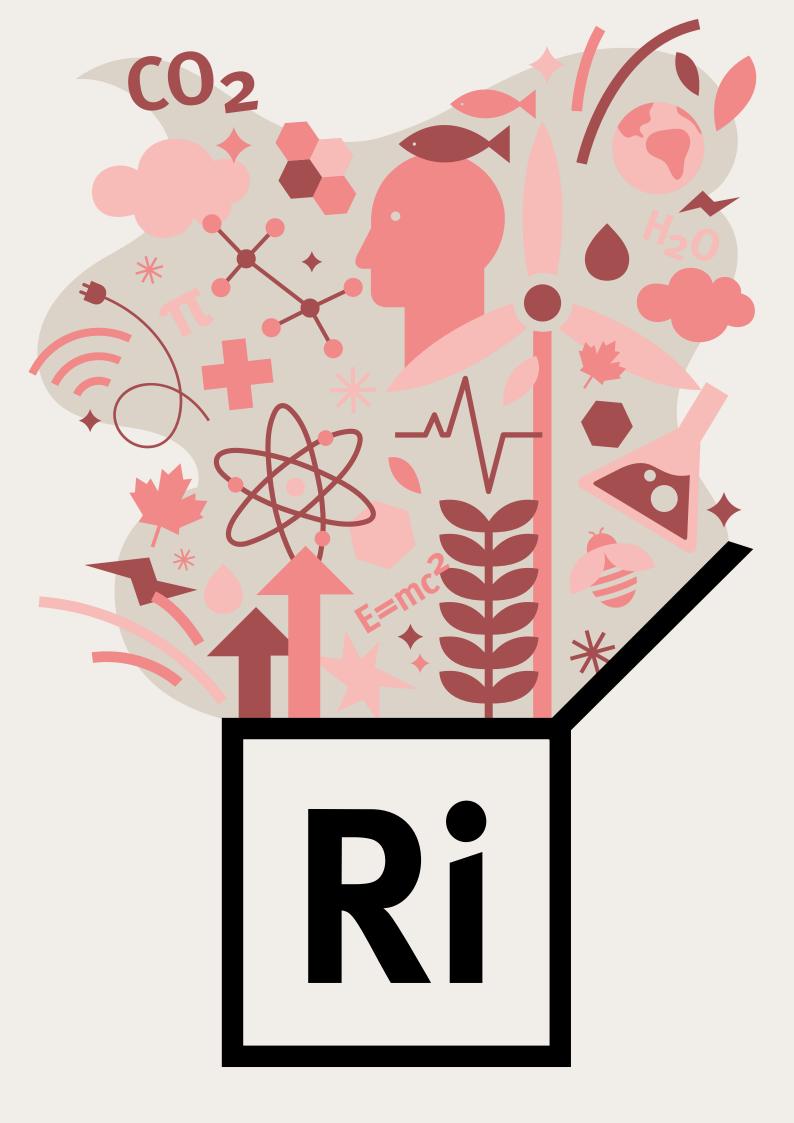
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We celebrated 10 years of providing hands-on exploration for schools in our L'Oréal Young Scientist Centre.



**Right:** Ri Masterclasses run from Truro to Aberdeen





### At the Ri

### Caring for our staff and volunteers

Everyone who works at the Ri is passionate about the Ri, or science, or both.

And everything we are doing at the Ri – the amount of activities we run, the number of people we are reaching, our fundraising, our membership, our impact – is growing because of our staff and volunteers. We recognise their expertise and passion as the cornerstone of our success.

So throughout the year we invested in developing and caring for our staff. At the end of 2019 we employed 25% more people than a year before. All are paid a minimum of the London Living Wage and 10% were promoted or offered new roles to further their careers. We reviewed our employee assistance programme, benchmarked all salaries, offered more holidays and carers leave, and have over half our staff working flexibly.

We also did more to increase our contribution to the fight against climate change. The energy we use is carbon neutral, with our suppliers required to use renewables or offset. Our electricity use has gone down while our recycling has gone up. We are changing our lights to LEDs and introducing more sensors. And we made it a requirement of our new catering contract that food miles be reduced, and waste and coffee grounds recycled.

Next year, we will find more improvements to make.

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## Funding our charitable work

We are grateful to all those who have supported our charitable activities throughout the year. With their continued help we see an opportunity for the Ri to lead best practice in science communication around the world, to engage millions more people with science, and to use 21st century technology to bring our unique history alive, preserving it for future generations.

This year, through the generosity of our supporters, we saw the income raised by our Development Team rise to £1.29 million, an increase of 61% versus 2017/18. This helped us to offer more schools activities for free, more free tickets to the filming of the CHRISTMAS LECTURES, and more Masterclasses across the country. We are grateful to all of the companies, trusts and foundations, and individual philanthropic donors without whom we would not be able to meet our charitable objectives.

The income we are able to raise ourselves, through event income or hiring our historic venue, complements the funding we receive from our generous supporters. In 2019 we hosted 276 events, raising £1.5 million to fund the work of the Ri; a 7% increase on 2018.

Importantly, our venue hire clients are more aligned with our aims and ethos than ever before. Like us, an increasing number are passionate about science. Technology company Adarga came to the Ri to host an event about the inseparable dependencies that exist between the human and the machine; the Physiological Society's 2019 President's Lecture was delivered by NASA astronaut and physiologist James Pawelczyk; and we hosted the British Science Association's Huxley Summit for the third year in a row.

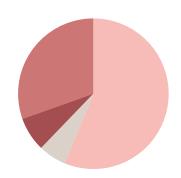


## Our governance and finances

In the 2018-2019 financial year we generated £2.8 million of trading income, £1.9 million in voluntary income through membership and events, and £0.5 million in voluntary income through fundraising. We have achieved a surplus of £4,000 on unrestricted funds compared to a £100,000 surplus in 2017-2018 and £280,000 the year before that.

In October, the Charity Commission confirmed they were confident that the Ri no longer required any special oversight. Our cash reserves remain robust with £0.9 million as at 30 September 2019.

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



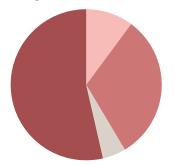
Above: How we spend our money.

Education programme: £2.99mCHRISTMAS LECTURES: £0.32m

Total expenditure 2018-19: £5.32m

### Below: How we fund our work. Total income 2018-19: £5.25m

- Donations and legacies: £0.53m
- Grants and events: £1.65m
- Membership and subscriptions: £0.26m
- Trading: £2.81m



### Our governance

The Royal Institution was founded in 1799 and received its Royal Charter on 13 January 1800. We are an independent Royal Charter Charity, governed by our byelaws and governing documents.

Our Trustees number 11 in total, nine elected by the membership of the Ri and two appointed by the Board. The Trustees ensure the Ri carries out its charitable purposes for public benefit and complies with its governing documents. Trustees have overall responsibility for managing the business of the Institution; setting strategic direction and objectives; safeguarding the Institution's assets; overseeing all significant capital expenditure and maintaining relevant policies. The Board meets a minimum of four times a year and is supported by the Audit and Risk Committee, Finance Committee and Nominations Committee.

#### Royal Patron -

Heritage: £0.39mTrading: £1.62m

HRH The Prince of Wales

#### President -

HRH The Duke of Kent

#### Honorary Vice President -

Sir John Ritblat

#### Trustees -

Sir Richard Sykes – Chair

Dr Fergus Boyd (retired April 2019)

Dr Sophie Forgan

Simon Godwin

Andrew Gregson (elected April 2019)

Prof Yike Guo

Lord Julian Hunt

Lucinda Hunt (appointed September 2019; retired December 2019)

Sir Roland Jackson (elected April 2019)

John Krumins

Sarika Patel (retired December 2019)

Christopher Potter (appointed September 2019)

Geoff Potter (retired April 2019)

Louise Terry - Deputy Chair (retired October 2019)

Prof Alison Woollard

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## Members and Patrons

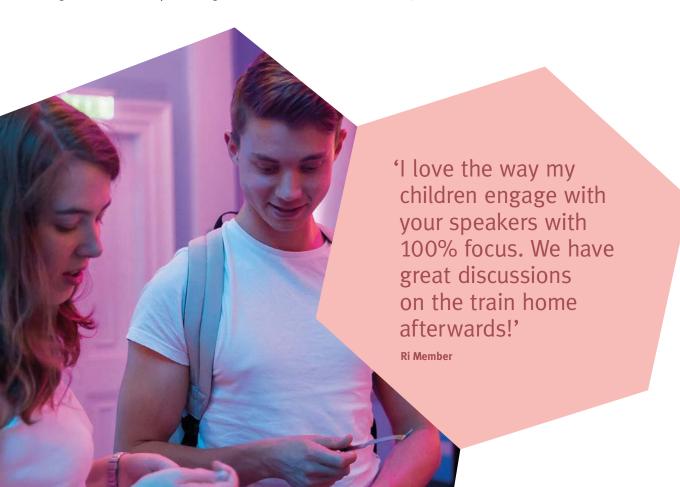
Members and Patrons have a long association with the Ri. It was the patronage of 58 philanthropists who founded the Institution in 1799 and just 21 years later we welcomed our first Ri Member. We have been a membership organisation ever since. And we have always been open to all.

Our membership community grew again during the year, by just under 10%. As at 31 December, 4,500 science lovers are enjoying free and better than half-price tickets to our public programme – including our special 'lates-style' member event 'ExpeRience' which in 2019 explored the 'science of music' – exclusive access to the CHRISTMAS LECTURES ticket ballot, and a host of other benefits.

We recognise the achievement of steady growth in Ri Membership, year on year, when many cultural organisations are experiencing a decline. Our Patrons programme was formally introduced at the Ri only as recently as 2016 and since then it has also grown steadily, raising over £150,000 in 2019. And we were pleased throughout the year, to welcome even more Patrons who pledged a higher level of support through our Director's Circle.

We would like to thank all of our Ri Members and Patrons for their invaluable support during the year. Their contribution helped us to create more opportunities to discover, discuss and critically examine science and the way it shapes the world around us.

**Below:** Membership ExpeRience



### Thank you

We must extend a huge thank you to all those who support the Royal Institution, in so many ways; our Trustees, Patrons, members, donors, corporate supporters, volunteers and visitors. As an independent charity we rely on your support to encourage people of all ages to begin their lifelong journey with science.

#### We look forward to continuing our important mission with you in 2020.

#### Major supporters -

Kantor Charitable Foundation L'Oréal UK & Ireland Simon Godwin

Causeway Technologies Lloyd's Register Foundation The Clothworkers' Foundation

#### Director's Circle Patrons -

Luca & Leila Bassi Cristóbal Conde Michael Fasosin Ron & Helen Freeman Simon Godwin Sir John Ritblat Bernard & Sarah Taylor

#### Faraday Circle Patrons -

Fiona Forbes & Jonathan Hiscock The Faraday Foundation **Hugh Harper** 

Sir Desmond Pitcher Hank Roberts

#### **Diffusion Circle Patrons -**

Nicholas & Tobe Aleksander Damon Patrick de Laszlo **GLC Charitable Trust** Matthew Gill

Renato Lulia-Jacob **Duncan McInnes** G J Moore Dame Theresa Sackler

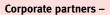
#### Magnetic Circle Patrons -

Azad Ayub Iain Bratchie Bernard J Bulkin John L Collins Stephen Corben James Cottam Paul Drake Francisco Freitas de Oliveira

Karen Hodson Jerry Horwood lan Laming Chris Lowe Gautam Mitra

Jaleh Namazi Martin Pidd Richard Pinch **Geoff Potter** Ralph Rayner E C Renton Gurjit Samra Robert Sansom Sir Richard Sykes

All of our Electric Circle patrons and all who wish to remain anonymous.



AWE plc Bayer **Environment Agency** Faraday Institution **KPMG** 

Medtronic

Roche Royal Society of Chemistry Schlumberger **UK Quantum Technologies** UK Research & Innovation

#### Trust & Foundations -

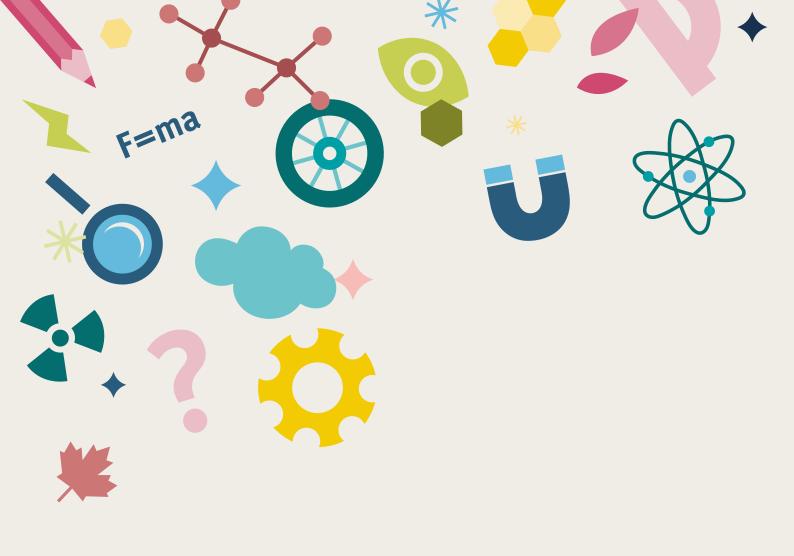
Company of Actuaries **Charitable Trust** John S Cohen Foundation Bernard Gold Foundation The Faraday Foundation **LG Harris Trust** AG Manly Charitable Trust Brian Mitchell Charitable Settlement

**GM Morrison Charitable Trust** National Centre for Nuclear Robotics Reece Foundation **Shears Foundation** DS Smith Charitable Foundation

#### Other partnerships -

The Genetics Society The National Education Union

**Above:** Membership ExpeRience



### Royal Institution of Great Britain 21 Albemarle Street London, W1S 4BS

ri@ri.ac.uk +44 (0)20 7409 2992

### rigb.org

Registered charity number: 227938

Image credits: Hana Ayoob, Paul Clarke, Luke Davies, Sarah Dick, Katherine Leedale, Tim Mitchell, Ri and Paul Wilkinson.

Design: Supple Studio

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Statistics in this review relate to either the 2019 calendar year or the 2018/19 financial year ending 30 September 2019.