

Trustees' report and financial statements

For the year ended 31 March 2016

Trustees

The Trustees of the Society are the members of its Council, who are elected by and from the Fellowship. Council is chaired by the President of the Society. During 2015/16, the members of Council were as follows:

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Sir Venki Ramakrishnan**

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Professor Anthony Cheetham

Physical Secretary

Professor Alexander Halliday

Foreign Secretary

Sir Martyn Poliakoff CBE

Biological Secretary

Sir John Skehel

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Professor Ian Stewart
Dame Janet Thornton DBE
Professor Cheryll Tickle**
Dr Richard Treisman**
Professor Simon White**

Executive Director

Dr Julie Maxton

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* Until 30 November 2015
** From 30 November 2015

Cover image

Tadpoles overhead
by Bert Willaert, Belgium.

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President's foreword



Having taken over as President of the Royal Society (the Society) in November 2015, I feel that I can offer something of an outsider's perspective on the Royal Society's work over the past year. It is our Fellowship that makes the Society's contribution to our culture unique. Our Fellows are the ones who are leading the science that allows us to better understand and change the world around us. They are also well placed to identify the people and ideas that will improve the lives of people in the UK and beyond.

V. Ramakrishnan

Venki Ramakrishnan
President of the
Royal Society

Tomas Lindahl FRS was awarded this year's Nobel Prize in Chemistry and Arthur B McDonald FRS was awarded the Nobel Prize for Physics. The Society's own Copley Medal, which dates back to 1731, was awarded to Peter Higgs FRS. These awards are just some of those given to Fellows over the past year reflecting their huge contribution to society.

The contribution of science and the Society covers a wide spectrum, from understanding the world around us, and indeed inside us, to the application of that knowledge to improving lives and driving the economy. This year the Society supported 425 of the most promising early career scientists through our University Research Fellowships, Sir Henry Dale Fellowships and Dorothy Hodgkin Fellowships. This long-term support, often at a pivotal point in their careers, gives these exceptional young people the best possible opportunity to fulfil their potential.

Translating ideas into innovation has been a key theme for the Society this year. With the Government conducting its five-yearly Spending Review, the Royal Society worked with the Academy of Medical Sciences, the British Academy, and the Royal Academy of Engineering to make the case for ongoing investment in research. The case was a compelling one and the Government's commitment to increased spending in this area through until 2020, when many parts of public spending face significant cuts, is a recognition of the crucial role of research to a successful innovation-based economy.

Beyond the Spending Review, the Society funded 43 Industry Fellowships to support knowledge transfer between academics and industry. We also launched the *Transforming our Future* conferences to address some of the major scientific and technical challenges of the next decade. We initiated a major project on machine learning to explore the roles machines may play in the future in transport, healthcare provision, the financial services sector and a range of other areas of our everyday lives. There was support too for a range of ideas through our innovation awards such as the Brian Mercer Awards for Innovation and Feasibility.

As a person who has lived and worked on four different continents, I appreciate how international the scientific endeavour is and the Royal Society remains a truly international player. Over the past year the Society has fought to protect European Union (EU) science funding as an investment in our future and sought to inform the debate on the EU referendum. We have also collaborated with the national science academies of the USA and China to examine the emerging issues around genome editing – a topic we expect to rise in global significance in the coming years.

The Society is one of several Newton Fund delivery partners tasked with supporting research collaborations that will establish a well-trained research community which will promote the economic development and welfare of developing countries. In the past year we have made 110 Newton Fund grants and awards. The Newton Fund was established in 2014 with £75 million a year shared among a number of delivery partners, and we look forward to continuing to be an active partner through until 2021 when the Fund will have increased to £150 million a year.

Whether it is tackling the problem of antibiotic resistance, helping industry and others attempt to curb pollution, increasing our understanding of and ability to treat cancers, understanding the workings of the human brain or the universe, Royal Society Fellows and Royal Society funded researchers are at the very forefront of improving our world.

The result of the referendum on UK membership of the EU, which resulted in a majority in favour of leaving, critically affects the science community. I have been and will continue to emphasise that in the challenging times ahead we must maintain the international focus of UK research and not short-change our investment in science.

Executive Director's report



A handwritten signature in black ink that reads "Julie Maxton".

Dr Julie Maxton
Executive Director
of the Royal Society

Convening meetings and instigating collaborative projects are among the Royal Society's greatest strengths and this year there have been many examples of such projects which have the potential to improve society.

In 2011, a Royal Society report, *Brain Waves*, explored developments in neuroscience and their implications for society and public policy and identified a gap between the current understanding of neuroscience and the day-to-day working of the justice system. To address this, the Society has put together a programme of seminars and meetings with senior judges to foster a deeper understanding of science by lawyers and vice versa. We held events on memory, uncertainty and probability and will hold a further one on mental capacity. In addition, with the Royal Society of Edinburgh, we have initiated a project to provide judges with a series of primers on specific areas of science. The first primer will be on DNA and the second on gait analysis.

As we move towards the goal set by the review of our scientific programme of increasing the number of scientific meetings we hold by 50%, this year we brought together 3,075 experts to share and discuss ideas and progress in 33 different areas of science.

In the summer of 2015, the Society convened many of the UK's leading scientific institutions with the BBC to plan a major new long-term project to engage the public with science. *New Age of Wonder* was launched by Lord Hall, Director General of the BBC, as part of the BBC's case for charter renewal. The Society will be working with the BBC and others to deliver this major initiative.

Our ability to mobilise people throughout the science community is central to our success. The best people to inspire an interest in science are those who are actually doing the science and our goal is to give people the opportunity to meet our scientists.

In education we help put practising scientists in the classroom and this year's Partnership Grants projects saw schools look at projects in solar physics, renewable energy, and conservation and plant science. In the coming year we will also be raising the importance of doing science in the classroom, rather than just reading about it, with the launch of a series of films and activities, fronted by Brian Cox FRS, the Royal Society Professor for Public Engagement in Science, that will focus on key experiments and their relevance to the real world.

Our public programme of events reached more than 23,000 people with 90% of feedback received being positive. For those who might not be able to make it to the events, our followers on Facebook and Twitter increased significantly over the year and now stand at around 120,000. Our *Objectivity* films, showcasing the historical archives of the Society, have had over 1.3 million views.

I was personally delighted to see the first solo female winner of the Royal Society Prize for Science Books in Gaia Vince. Science still has a big problem with women under-represented in many areas and this year the Society's diversity programme has included providing guidance for all our selection panels on unconscious bias. Our *Parent, Carer, Scientist* campaign also highlights the different ways scientists have combined their careers with everyday family responsibilities.

The UK is outstanding at science yet science still does not enjoy the central place in our culture that its importance deserves. In many ways the challenge of inspiring more people to engage with science mirrors the work of the scientists that we fund, in that it is a gradual process with many smaller successes building towards a greater goal. Having existed for over 350 years, the Royal Society is committed to a long-term programme of work that will both promote science and its benefits and celebrate its contribution to improving our lives.

Trustees' report

The Royal Society

The Royal Society of London for Improving Natural Knowledge, commonly known as The Royal Society, is a self-governing Fellowship of many of the world's most distinguished scientists drawn from all areas of science, technology, engineering, mathematics and medicine. It is the science academy of the UK and of the Commonwealth. The Society's fundamental purpose, reflected in its founding Charters of the 1660s, is to recognise, promote and support excellence in science and to encourage the development and use of science for the benefit of humanity.

Fellows are elected through a peer-review process on the basis of their excellence in science. At 31 March 2016 there were 1,419 Fellows and a further 167 Foreign Members, including 80 Nobel Laureates. It is from the eminence of its Fellowship and Foreign Membership and its independence from government and particular interests that the Society derives its authority in scientific matters. Fellows and Foreign Members fulfil a range of responsibilities for the Society on a voluntary basis. Many others, scientists and non-scientists, also contribute to the work of the Society on a voluntary basis. The Fellowship is supported by staff based in London.

Below
Summer Science
Exhibition, 2015.



The six strategic priorities detailed in the Society's Strategic Plan 2012 – 2017 are:

- Promoting science and its benefits
- Recognising excellence in science
- Supporting outstanding science
- Providing scientific advice for policy
- Fostering international and global cooperation
- Education and public engagement

The following six sections describe the Society's work under those headings. The Society undertakes a very broad range of activities that provide public benefit either directly or indirectly.

The current Strategic Plan ends in 2017 and in the year ahead the Society will develop a new plan to replace it, supporting the pursuit of its mission to recognise, promote and support excellence in science and to encourage the development and use of science for the benefit of humanity.



Public benefit

Research and innovation advance our economic, social and cultural well-being and health and are the key to sustainable long-term economic growth. The Society's mission is to recognise, promote and support excellence in science and to encourage the development and use of science for the benefit of humanity. As shown in this report, the Society undertakes a broad range of activities that provide public benefit either directly or indirectly. These include providing financial support for early career scientists to pursue outstanding research, organising discussion meetings to advance science, providing expert scientific advice to policy-makers including on science education, promoting the importance of science internationally and the staging of programmes to engage the public with science. The Society is concerned with excellent science, wherever and by whomever it is done and is committed to increasing diversity in science, technology engineering and mathematics (STEM).

Looking forward

We have budgeted to increase expenditure on our grants schemes through an expansion of our current programme, particularly the Dorothy Hodgkin Fellowships, and by developing new awards, including Interdisciplinary Awards and Theo Murphy Blue Skies Awards. The Society will also offer new grant programmes funded by the Government's Global Challenges Research Fund, which is part of the UK aid strategy funded by Overseas Development Assistance.

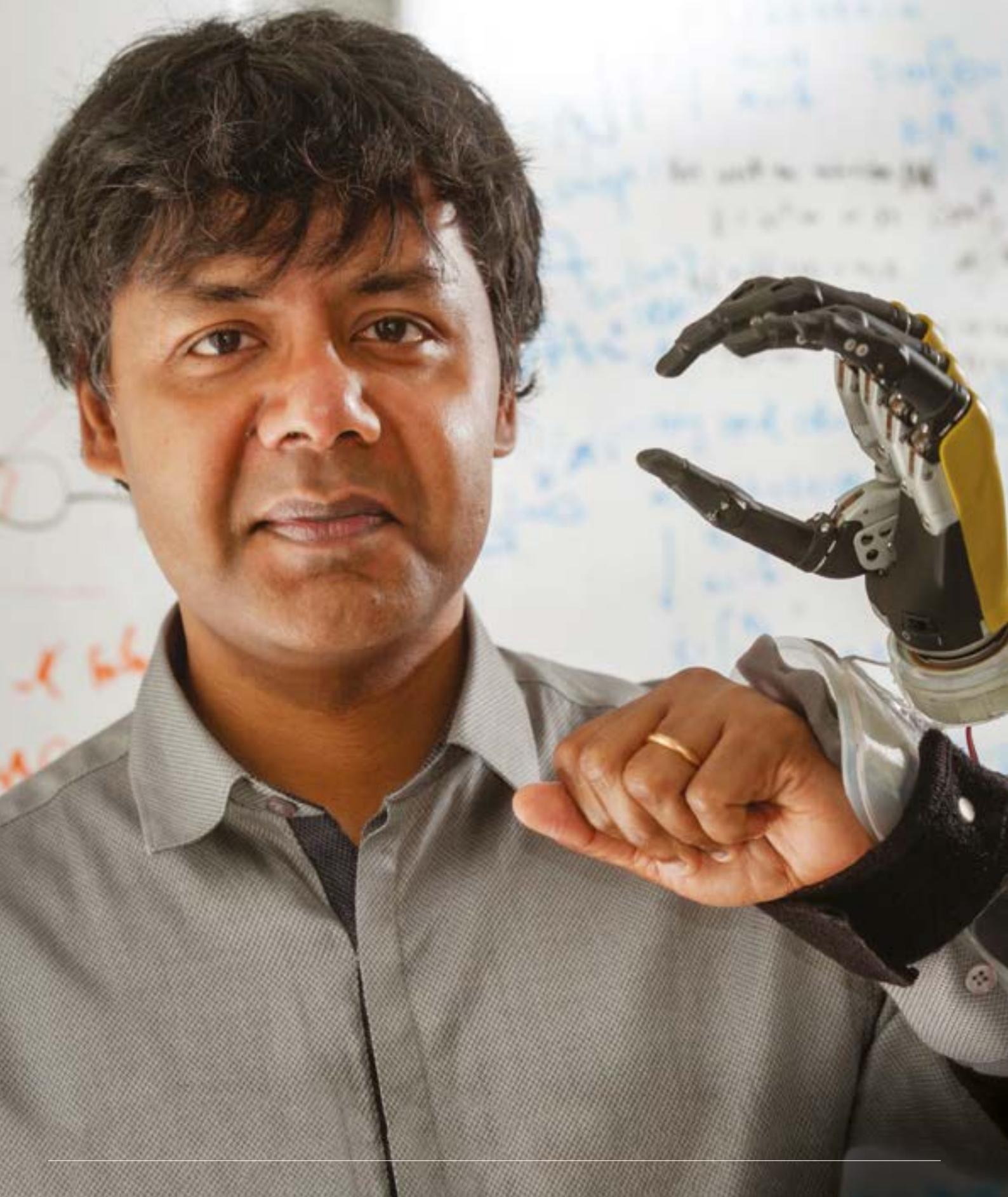
The Society will contribute to discussion of matters related to the Higher Education Bill, affecting teaching and research.

Our science policy work will be guided by a new strategy which will establish a step-change in the Society's engagement with policy-makers. We will deliver a policy report on cybersecurity and a question and answer document on genetic modification.

This will be complemented by increased public engagement activities, including partnerships with other organisations to facilitate increased public engagement with science. In particular we will work with the BBC on the *New Age of Wonder*, and expand our regional presence by exhibiting at the Manchester Science Festival.

In collaboration with senior members of the judiciary, we will publish the first judicial primer on DNA evidence, part of a major new programme on Science and the Law. Finally, following on from the success of the 2014 Commonwealth Science Conference in Bangalore, we have already begun working with the National Research Foundation of Singapore on the next Commonwealth Science Conference which will take place in Singapore in June 2017. The theme of the 2017 conference will be resilience including infectious diseases, low-carbon energy and sustainable cities.

On 23 June 2016, there was a referendum on UK membership of the European Union. The result was a majority in favour of the UK leaving the EU. This poses key questions for science funding generally and for aspects of the Society's grant schemes. The Society intends to continue the work it has started with others to secure the best outcome for the science community in these new circumstances.



Promoting science and its benefits

Outstanding science, technology and innovation are essential to improving health and well-being and advancing our cultural, social and economic lives. Working across the full spectrum of scientific disciplines, the Royal Society supports scientists working in industry and academia to encourage the development and use of science for the benefit of humanity.

Left

Professor Sethu
Vijayakumar speaking
at the *Robotics and
autonomous systems*
conference, 2015.

Promoting science and its benefits

Professor Sethu
Vijayakumar's lecture
on *Shared autonomy
for interactive
robotics: closing the
loop* reached over

32,000

people on Facebook
– our most watched
video on Facebook
to date.

Industry and translation

World-class industrial research is essential for transforming innovative ideas into commercially successful products and services. Our industry and translation programme aims to bring together industry, academia and government to advance ideas and support scientists who wish to develop their research into commercial products.

2015/16 saw the first full year's implementation of the Society's science, industry and translation strategy.

Areas of focus included:

Transforming our Future conferences

This conference series has been established to address the major scientific and technical challenges of the next decade. Our conferences feature cutting-edge science from industry and academia, bringing together leading experts from the wider scientific community, industry, government and charities to discuss these challenges. So far we have covered machine learning (feeding into our policy project on the same area, page 52) and robotics and autonomous systems. The series will also include an event on environmental observation in the agri-tech sector and future topics for 2016/17 include synthetic biology, energy storage, the internet of things and regenerative medicine.

What our participants say

Machine learning conference

"First class programme and venue, the right length and depth for its purpose, and a good balance of presentation versus networking time."

"The quality of the speakers and their presentation made this one of the best events I've ever attended."

"Very thought-provoking, a good top-line treatment of the issues and opportunities."

"The conference was excellent with a wide range of interesting and knowledgeable speakers. I thoroughly enjoyed it."

Robotics and autonomous systems conference

"It was a superb meeting with great speakers and some interesting conversations and possible future new collaborations"

"Awesome! Or as Brits would say 'Brilliant!'"

"The choice of speakers was really good as each speaker addressed a different aspect of RAS application in their area of interest. I thoroughly enjoyed being in a historically famous place of excellence."

Dr Catherine Cazin

University of St Andrews, University Research Fellow

Over half of researchers holding a Royal Society grant or Fellowship award have been involved in some form of commercialisation activity – here is a success story from one of them.

Greener, cheaper, more efficient: improving production through cutting-edge catalysts

Dr Catherine Cazin, University of St Andrews, University Research Fellow.

From pharmaceuticals to fragrances, dyes to agrochemicals, many products require catalysts in their manufacture. Many catalysts are expensive, require large quantities and high temperatures to work properly, and leave toxic residues in the final product. The result is inefficient production and higher costs for producers and consumers. Dr Cazin specialises in the discovery of new catalysts that need less energy to activate, are greener and generate less waste and residue.

Industry has great interest in obtaining alternative products in the supply chain, and large multinationals such as AstraZeneca and Syngenta support Dr Cazin's research through industrial CASE (Co-operative Awards in Science and Technology) studentships. This initiative offers an excellent opportunity for industry to learn about the latest academic research while training the next generation of industrial researchers.



Left

Dr Catherine Cazin,
University of St Andrews,
University Research Fellow.

Success stories

We commissioned research to investigate the commercialisation activities of individuals funded through our grants and Fellowships since 2009. In this period, half of the researchers holding a Society grant or Fellowship have been involved in commercialisation activities in some form.

Awards

Labs to Riches is our flagship celebration of industry and translation. This event recognises the talent of some of our leading innovative thinkers and entrepreneurs with the presentation of the Brian Mercer Awards for Innovation and Feasibility. In 2016 we welcomed Baroness Martha Lane-Fox CBE, founder of Lastminute.com, as the keynote speaker to talk about entrepreneurial risk and reward.

The Brian Mercer Award for Innovation, a £250,000 award for researchers who wish to develop an already proven concept or prototype into a commercial product, was awarded to Professor Kevin Homewood, Queen Mary University of London to help develop new technology that will enable silicon-based photodetectors to detect

wavelengths of light which previously could only be detected by devices using highly toxic materials. The future application of these photodetectors includes use in smart buildings and cities, reducing energy consumption, greenhouse emissions and pollution.

Brian Mercer Feasibility awards were made to Professor Paul French and Dr Teuta Pilizota. These £30,000 awards are for researchers to investigate the technical and economic feasibility of commercialising their scientific research. Professor French and his colleague Dr James McGinty are planning to commercialise new biomedical imaging technology that will be able to provide 3D images of larger samples of tissue at faster speeds than is possible with standard microscopes. Dr Pilizota's project aims to design a platform for automated imaging of individual bacterial cells during different stages of the bioindustry production process – addressing the lack of online information available to industrial biotechnologists when assessing product quality.

These awards are supported by the Engineering and Physical Sciences Research Council (EPSRC), the ERA Foundation (which funds awards in electro-technology) and the Lord Leonard and Lady Estelle Wolfson Foundation (which funds awards in biomedical science).



Right

Baroness Martha Lane-Fox CBE, founder of Lastminute.com at Labs to Riches.

We actively encourage links between industry and academia to ensure that research-based innovation thrives in the UK. We have a number of the schemes to promote this type of collaboration and as of 31 March 2016, supported:

- 43 Industry Fellows including seven new appointments made during the year. These awards support knowledge transfer between industry and academia and are funded by the Royal Society, the EPSRC and Rolls-Royce plc.
- 6 Paul Instrument Fund award holders. This award is for scientists who want to design and construct a novel instrument to measure phenomena in the physical sciences. This scheme was established through the will of the late R W Paul.

In the forthcoming year, we will introduce an expanded Royal Society translation and innovation awards programme and a new work stream looking at skills gaps including how to create a more entrepreneurial culture. We will also continue to develop our Industry Fellows College which brings together current and past Industry Fellows to network, share ideas and contribute to the Society's science, industry and translation strategy.

Scientific meetings programme

Discussion meetings bring together leading experts from across the world to present and discuss new areas of research in all fields of science. In 2014 the Society's Council approved an increase in the size of the programme in view of the number of high-quality submissions for meetings received. The next financial year will see the completion of this expansion.

In 2015/16:

- We welcomed 3,075 participants across 33 meetings, spread between our premises at Carlton House Terrace and the Kavli Royal Society International Centre at Chicheley Hall.
- Highlights included the *Bioinspiration of new technologies* meeting in May 2015, which was also available as a live stream online, with participants able to submit their questions in real-time for inclusion in the discussion at the meeting.
- In October the *Major transitions in human evolution* meeting brought conservationist Richard Leakey to the Society.
- The *new bacteriology* meeting in January 2016 saw the President of the Society, Sir Venki Ramakrishnan present on *Structural insights into ribosome-dependent activation of stringent control*.
- Other topics included *Supercritical fluids - green solvents for green chemistry?*, *Communications networks beyond the capacity crunch* and *Cells: from Robert Hooke to Cell Therapy – a 350-year journey*.

"This was a 'must go to' meeting that succeeded in every way."

"Great line up of speakers."

Feedback received from participants at the Royal Society scientific discussion meeting, *Biological and climatic impacts of ocean trace element chemistry*.

Royal Society scientific discussion meetings 2015/16

Supercritical fluids – green solvents for green chemistry?

Organised by Dr Peter Licence and Professor Andrew Cooper

13 – 14 April 2015

Communication networks beyond the capacity crunch

Organised by Professor Andrew Ellis, Professor Sir David Payne CBE FREng FRS and Professor David Saad

11 – 12 May 2015

Bioinspiration of new technologies

Organised by Professor Denis Noble CBE FMedSci FRS, Professor Richard Templer and Professor Clemens Kaminski

27 May 2015

Catalysis improving society

Organised by Professor Graham Hutchings FRS, Professor Richard Catlow FRS, Professor Christopher Hardacre and Professor Matthew Davidson

8 – 9 June 2015

The interaction of fire and mankind

Organised by Professor Andrew Scott, Professor William Chaloner FRS, Dr Claire Belcher and Professor Chris Roos

14 – 15 September 2015

Cells: from Robert Hooke to cell therapy – a 350-year journey

Organised by Professor Sir Ian Wilmut FRS, Professor Johan Hyllner and Professor Chris Mason

5 – 6 October 2015

Soft interfacial materials: from fundamentals to formulation

Organised by Professor Michael Cates FRS, Professor John Seddon, Dr Nicholas Brooks, Dr Paul Clegg and Professor Alex Lips

12 – 13 October 2015

Major transitions in human evolution

Organised by Professor Robert Foley FBA, Professor Chris Stringer FRS, Dr Marta Mirazón Lahr and Professor Lawrence Martin

22 – 23 October 2015

Dating species divergences using rocks and clocks

Organised by Professor Ziheng Yang FRS and Professor Philip Donoghue FRS

9 – 10 November 2015

Unifying physics and technology in light of Maxwell's equations

Organised by Professor Anatoly Zayats, Professor John Ellis CBE FRS and Professor Roy Pike FRS

16 – 17 November 2015

Biological and climatic impacts of ocean trace element chemistry

Organised by Professor Gideon Henderson FRS, Professor Ed Boyle, Professor Maeve Lohan, Dr Micha Rijkenberg and Dr Géraldine Sarthou

7 – 8 December 2015

Royal Society scientific discussion meetings 2015/16

The new bacteriology

Organised by Professor Stephen Busby FRS, Professor Pascale Cossart ForMemRS and Professor David Holden FRS
28 – 29 January 2016

Taking the temperature of phase transitions in cool materials

Organised by Professor Neil Mathur, Dr Xavier Moya and Dr Sohini Kar-Narayan
8 – 9 February 2016

Tackling emerging fungal threats to animal health, food security and ecosystem reliance

Organised by Professor Matthew Fisher, Professor Sarah Gurr and Professor Neil Gow
7 – 8 March 2016

One health for the real world: zoonoses, ecosystems and well-being

Organised in partnership with the Zoological Society of London and the Dynamic Drivers of Disease in Africa Consortium

17 – 18 March 2016

“A great opportunity to learn about specific issues.”

Feedback received from a participant at the Royal Society scientific discussion meeting, *Tackling emerging fungal threats to animal health, food security and ecosystem resilience*.

“This meeting was more than successful.”

Feedback received from a participant at the Theo Murphy meeting, *Towards implementing the new kelvin*.

Theo Murphy meetings at the Kavli Royal Society International Centre 2015/16

Nanostructured carbon membranes for breakthrough filtration applications

Organised by Professor Davide Mattia, Professor Jason Reese FREng FRSE, Dr Duncan Lockerby, Professor David Emerson and Dr Ben Corry
27 – 28 April 2015

Towards implementing the new kelvin

Organised by Professor Graham Machin, Professor Peter Hänggi, Professor John Saunders, Professor Martin Turner and Dr Joachim Fischer
18 – 19 May 2015

Elements, genomes and ecosystems: cascading nitrogen and phosphorus impacts across levels of biological organisation

Organised by Professor Andrew Leitch, Professor Maurine Neiman, Professor Dag Hessen, Professor Puni Jeyasingh, Professor Lawrence J Weider and Dr Ilia Leitch
1 – 2 June 2015

Long non-coding RNAs: evolution of new epigenetic and post-transcriptional functions

Organised by Professor Leonard Lipovich, Professor John Rinn, Professor Douglas Higgs FRS, Professor Nicholas Proudfoot FRS and Professor Lynne Maquat
28 – 29 September 2015

"Thoroughly worthwhile event, excellent talks and extremely positive outcome."

Feedback received from a participant at the Theo Murphy meeting, *Domain walls as new 2D functional materials*.

"A very good and thought provoking meeting."

Feedback received from a participant at the Theo Murphy meeting, *The origin, history and role of water in the evolution of the inner Solar System*.

Theo Murphy meetings at the Kavli Royal Society International Centre 2015/16

Cutting science in biology and engineering

Organised by Professor Gordon Williams FREng FRS, Professor Tony Atkins FREng, Professor Peter Lucas and Dr Maria Charalambides

26 – 27 October 2015

Mass spectrometry imaging – challenges and opportunities for next-generation capabilities

Organised by Professor Ian Gilmore, Professor John Vickerman, Professor R Graham Cooks, Professor Richard Caprioli and Professor Anne Dell CBE FRS

23 – 24 November 2015

Multi-scale modelling of the structural integrity of composite materials

Organised by Dr Peter Beaumont and Professor Constantinos Soutis

25 – 26 January 2016

Interpreting BOLD: a dialogue between cognitive and cellular neuroscience

Organised by Dr Anusha Mishra, Professor David Attwell FRS, Dr Zebulun Kurth-Nelson, Dr Catherine N Hall and Dr Clare Howarth

28 – 29 January 2016

The origin, history and role of water in the evolution of the inner Solar System

Organised by Professor Monica Grady CBE, Professor Sara Russell and Professor Chris Ballentine

1 – 2 February 2016

Domain walls as new 2D functional materials

Organised by Professor Marty Gregg, Professor James Scott FRS and Professor Marin Alexe

22 – 23 February 2016

Evolution brings Ca²⁺ and ATP together to control life and death

Organised by Professor Ole Petersen CBE FRS and Professor Alexei Verkhratsky

16 – 17 March 2016

Stratified turbulence in the 21st century – new insights on an increasingly important problem

Organised by Professor Paul Linden FRS, Professor Richard Kerswell FRS, Dr Colm-cille Caulfield, Dr Stuart Dalziel and Dr John Taylor

21 – 22 March 2016

As part of the review of the scientific meeting programme, we will introduce a new series, called Science +, which will bring together scientists and experts from other fields such as policy-making or the humanities.

Science and the Law

The Society, in partnership with the Judicial College, is hosting a series of seminars on scientific topics relevant to court proceedings, such as memory in testimony, probability, and mental capacity, for senior judges. This project had its beginnings in our 2011 *Brain Waves* report on neuroscience and the law, which highlighted the lack of a forum in the UK for scientists, lawyers and judges to explore areas of mutual interest. In the coming year we will be working with the Royal Society of Edinburgh and senior members of the judiciary in England and in Scotland on a series of guides or 'primers' on scientific topics, designed to assist the judiciary, legal teams and juries when handling scientific evidence in the courtroom. The first primer document to be developed will cover DNA analysis.

"The Royal Society should be, as it now is, reaching out to the judiciary and the legal professions in order to ensure that judges and lawyers can obtain information and learn about techniques which will enable them to perform their duties more effectively and reliably – and, for our part, the lawyers and judges should be, as we are, welcoming you with open arms.

It is indeed fitting that one area to which the Society has been reaching out is another very successful UK endeavour, namely that of law. The rule of law has helped to ensure that the UK has had an unequalled peaceful and civilised history at home for over 300 years. And the international reputation of the common law and the English legal system and judiciary is such that that English law is the law of choice, and the courts in London are the tribunal of choice, for a large proportion of international commercial disputes. But, like science, law cannot afford to be complacent: we each have to strive to keep ahead. So, here in the UK, science and law should be reinforcing each other – excellence reinforcing and learning from excellence."

Lord Neuberger, President of the Supreme Court, in a speech at the Royal Society in November 2015.



Above
Lord Neuberger,
President of the
Supreme Court.

Right top

Royal Society Pairing scheme: Carol Monaghan MP (left) and her pair Dr Isabel Vincent, University of Glasgow.

Right bottom

Ed Vaizey MP (left) and his pair Dr Simon Clarke, University of Reading.



Pairing scheme

The Royal Society pairing scheme, co-funded by the Government Office for Science, gives Parliamentarians and civil servants the opportunity to spend time with research scientists in Westminster and in the scientists' institutions.

In 2015/16:

- 32 researchers were paired with 16 Parliamentarians and 16 civil servants. Parliamentarians taking part included George Freeman MP, Ed Vaizey MP, Lord Prior and Nicola Blackwood MP, chair of the Commons Science and Technology Committee. Jo Johnson MP, Minister for Universities and Science and Sir Mark Walport, Government Chief Scientific Adviser, attended the Society's Week in Westminster reception to talk to researchers.
- The Royal Society celebrated the 15th anniversary of the scheme which has paired 366 scientists, 154 MPs, 4 peers and 107 civil servants.

What scientists and MPs say

"Lilian had to work so rapidly, gaining familiarity with a concept, discussing it, making a decision and moving on to the next area. There was so much to get through and it looked like really hard work! The whole experience has really given me a flavour for the constraints policy makers are under. They really need scientists to provide clear, concise arguments at every stage of the process."

Rebecca Dewey, University of Nottingham paired with Lilian Greenwood MP

"We really enjoyed having Professor Baines with us, and learnt a lot from his expertise. In particular, his academic perspective on the underlying economics helped us think differently about the efficiency savings challenge faced by the NHS...We've already invited him back to see us again in January! I'd definitely recommend the pairing scheme to civil service colleagues."

Claire Stoneham, Department of Health paired with Professor Darrin Baines, University of Coventry

"I'm often required to learn about very technical things very quickly. Having access to experts who can explain the details and the way that my decisions would affect them in their field and in their profession is very valuable."

Nicola Blackwood MP, Chair of the House of Commons Science and Technology Committee, paired with Dr Matthew Levy, University of Oxford

Diversity

The Society is concerned with excellent science wherever and by whomever it is done. It is committed to increasing diversity in science, technology, engineering and mathematics (STEM) by seeking out participation from under-represented groups, in order to build and develop a world in which studying and working in science is open to all. This is important, for example, in order to increase UK competitiveness and prosperity.

We are finalising the first in a series of annual diversity reports which will provide diversity data across our activities to allow us to monitor progress in this area.

In 2014 the Society reported that an unusually small number of women had accepted its University Research Fellowships and published a review of actions it would take to address the issue. In 2015, 21% of the awards were given to women, in line with the numbers who applied. However, work continues to encourage more women and other under-represented groups to apply for our awards.

In 2015/16 we:

- Published our three-year diversity strategy for 2015 – 2018, setting out how the Society will use its convening power and leadership, in partnership with others, to increase diversity in STEM and build a more inclusive scientific community. This builds on the achievements of the four-year BIS-funded STEM Diversity Programme 2011 – 2015. It covers externally facing projects and activities as well as all major Society activities including, but not exclusively limited to: election to the Fellowship; recognising and supporting the work of outstanding scientists through our medals, awards and prizes, and grants schemes;

scientific discussion meetings; public engagement activities; and independent policy work including education policy and education outreach work.

- Introduced a briefing and animation on unconscious bias with the primary aim of alerting selection and appointment panel members to potential biases that can arise when making decisions. The guidance has been shared widely with over 30,000 views of the animation on our YouTube channel.
- Held our third annual diversity conference entitled *Pride and Prejudice – breaking down barriers in science*. The conference examined the barriers to entry and progression in STEM that impact under-represented groups. The keynote was delivered by renowned Harvard Professor Mahzarin R. Banaji, founder of Project Implicit.
- Announced a new award, the Royal Society Athena Prize, to recognise individuals and teams in the UK research community who have contributed towards the advancement of diversity in STEM in their organisation.
- Organised our first LGBT STEM event, *Out in STEM*, in partnership with Diversity Role Models. This was a panel discussion on how to include lesbian, gay, bisexual, transgender and other sexual identities (LGBT+) when creating inclusive environments in STEM.

**Above**

Diversity conference 2015.

**Above**

Dr Julius Hafalla, Royal Society University Research Fellow, took part in our *Parent, Carer, Scientist* campaign.

Parent, Carer, Scientist

We launched a new campaign *Parent, Carer, Scientist*, to illustrate that early career scientists and those considering a career in science do not have to choose between research and their aspirations and commitments outside the lab. Featuring 150 personal stories, the campaign has been widely promoted in the media and through social media using the hashtag #AndAScientist.

The work on improving diversity in science continues and we will work with partner organisations to support activities that aim to break down barriers to participation and success in STEM, and to recognise and champion the achievements of a wide range of scientists from under-represented groups.

Enterprise Fund

The Royal Society Enterprise Fund was created in 2008 from donations to the Society totalling approximately £7 million. The aim was for the Fund to become a financially successful contributor to early-stage science-based companies and a role model for the translation of excellent science for commercial and social benefit.

In 2014 the Society entered into a Limited Partnership Agreement with Amadeus Capital Partners to continue the charitable objectives of the Fund, under the new name of the Amadeus RSEF LP. Through the partnership, the Fund continues to make investments in early-stage science-based companies in the UK which also benefit from the commercial expertise of the team at Amadeus.

Up until January 2016 the Amadeus RSEF LP held investments in 17 early-stage companies. During the 2015/16 financial year, one company in which the Amadeus RSEF LP held shares was sold, raising funds which will be reinvested into the partnership to continue to support early-stage companies.

Dr Ainhoa Mielgo

Royal Society Sir Henry Dale Fellow 2013

Parent, Carer, Scientist celebrates the diversity of work-life patterns of 150 scientists across the UK with the aim of increasing the visibility of people combining a career in science with a family life.

My research

Pancreatic cancer is a devastating disease and is predicted to become the second biggest cause of cancer death by 2020. In pancreatic cancer, like in other solid cancers (ie breast, liver or lung), tumour cells are surrounded by a tumour microenvironment consisting of a large number of non-malignant cells, also known as stromal cells. Stromal cells play an important role in cancer progression and resistance to therapy but the molecular mechanisms by which stromal cells support cancer progression are not completely understood. My research focuses on understanding the complex interactions between tumour cells and stromal cells in order to identify new combination treatments targeting both the tumour cells and the tumour microenvironment.

My journey

I always wanted to become a researcher. I met my husband while we were PhD students and thus, we always experienced the two-body challenge. My two children were born during our postdoctoral training. This brought an additional challenge to my life, but being a mum also made me become more efficient and organised and did not stop me from pursuing my career in research. I always make the most out of my time, whether I am at work, or with my family, and I always pursue my dreams and persevere if they do not become true on my first attempt.



Above

Dr Ainhoa Mielgo,
Royal Society Sir Henry
Dale Fellow 2013.



Recognising excellence in science

The Society recognises the excellence and creativity of scientists by election to the Fellowship and Foreign Membership and gives awards to those scientists who are making a major contribution to society.

Left

Sir James Dyson CBE
FREng FRS, at the
Admission Ceremony
for new Fellows 2015.

Recognising excellence in science

The Fellowship

Forty-seven new Fellows, ten new Foreign Members and two Honorary Fellows were elected to the Society in April 2015, of whom twelve were women. New Fellows were admitted in July 2015 at the Admission Ceremony and a full list of those elected in 2015 can be found the following pages of this report.

Fellowship programme

We organise a Fellowship programme to enable our Fellows to participate more fully in the work of the Society. It also provides opportunities for Fellows to meet with each other in professional and social settings. In 2015/16, two research weekends were held at Chicheley Hall. The first, in September 2015, was hosted by Professor Paul O'Brien FRS and Professor Jenny Nelson FRS. In January, Professor Dianne Edwards FRS and Professor Richard Catlow FRS hosted the second weekend.



Right

Admission Ceremony 2015.

New Fellows 2015

Professor Mark
Achtman FRS



Professor Ali Alavi FRS



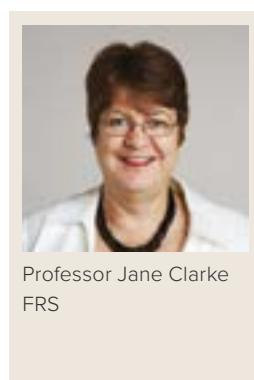
Professor Allan Balmain
FRS



Professor Kamal Bawa
FRS



Professor Stephen
David Macleod Brown
FRS



Professor Jane Clarke
FRS



Mr Clifford Christopher
Cocks FRS



Sir Rory Collins FRS



Professor Andrew Ian
Cooper FRS



Dr Stephen Anthony
Cusack FRS



Professor Anne Cutler
FRS



Professor Benjamin
Guy Davis FRS



Professor Annette
Catherine Dolphin FRS



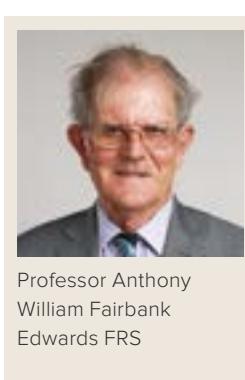
Professor Phillip C J
Donoghue FRS



Professor Daniel
Drucker FRS



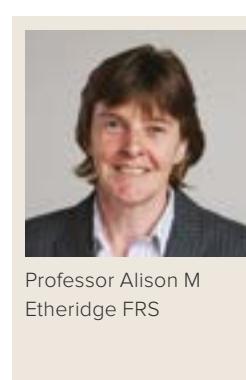
Sir James Dyson FRS



Professor Anthony
William Fairbank
Edwards FRS



Professor Yvonne
Patricia Elsworth FRS



Professor Alison M
Etheridge FRS



Professor Jeremy
James Farrar FRS



Professor Zoubin
Ghahramani FRS



Professor Michael
Edward Goddard FRS



Professor Michael
Andreas Häusser FRS



Professor Laurence
Daniel Hurst FRS



Professor Jane
Langdale FRS



Professor Andrew
Mackenzie FRS



Professor Philip
Maini FRS



Professor Jens
Marklof FRS



Professor Gero
Miesenböck FRS



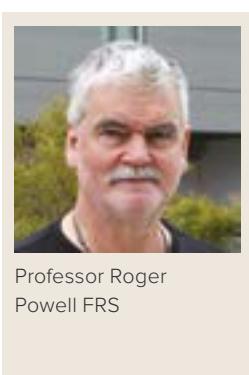
Dr Ketan Patel FRS



Professor David
Phillips FRS



Professor Jonathan
Pila FRS



Professor Roger
Powell FRS



Professor John Gilroy
Rarity FRS



Professor Andrew
Fraser Read FRS



Professor Alan Madoc
Roberts FRS



Professor John
Robertson FRS



Professor Roger Arthur
Sheldon FRS



Dame Julia Slingo FRS



Professor Scott William
Sloan FRS



Professor Henry James
Snaith FRS



Professor Ajay Kumar
Sood FRS



Professor Natalie
Catherine Jane
Strynadka FRS



Professor Richard Paul
Winsley Thomas FRS



Professor Bryan Michael
Turner FRS



Dr Frank Uhlmann FRS



Professor Colin James
Ness Wilson FRS

New Foreign Members 2015



Professor Alain Aspect
ForMemRS



Professor Zdeněk P
Bažant ForMemRS



Dr Linda Brown Buck
ForMemRS



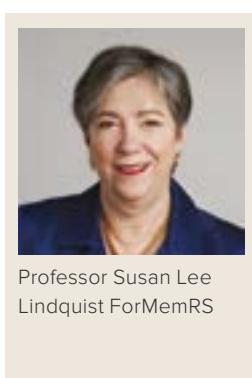
Professor Andrew
Herbert Knoll
ForMemRS



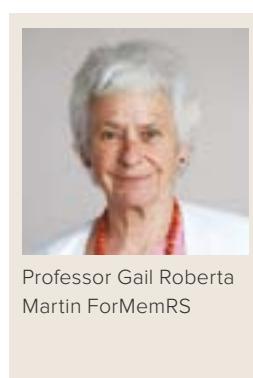
Professor John Kuriyan
ForMemRS



Professor Jiayang Li
ForMemRS



Professor Susan Lee
Lindquist ForMemRS



Professor Gail Roberta
Martin ForMemRS



Professor William
Hughes Miller
ForMemRS



Professor John Charles
Howarth Spence
ForMemRS

New Honorary Fellows 2015



Professor Lisa Jardine
FRS



Sir Robin Saxby FRS

Medals and Awards 2015/16

The Society's medals, awards and prize lectures provide a mechanism for the recognition and celebration of excellence within all aspects of science. The public recognition of leading scientists serves to inspire others to continue the advancement of science.



Copley A Medal
Professor Peter Higgs
CH FRS



Croonian Medal and Lecture
Professor Enrico Coen
CBE FRS



Bakerian Medal and Lecture
Professor Andrea Ghez



Royal A Medal
Dame Jocelyn Bell
Burnell DBE FRS



Royal B Medal
Professor Elizabeth
Blackburn AC FRS



Royal C Medal
Sir Christopher
Llewellyn Smith FRS



Buchanan Medal
Professor Irwin McLean
FMedSci FRS



Davy Medal
Professor Gideon
Davies FMedSci FRS



Gabor Medal
Professor Benjamin
Simons



Hughes Medal
Professor George
Efstathiou FRS



Michael Faraday Prize and Lecture 2015
Professor Katherine Willis



Wilkins-Bernal-Medawar Medal and Lecture
Professor Hasok Chang



Clifford Paterson Medal and Lecture
Professor Russell Cowburn FRS



Francis Crick Medal and Lecture
Dr Madan Babu Mohan



GlaxoSmithKline Prize and Lecture 2016
Professor Andrew Hattersley FRS



Pfizer Advanced Award
Professor Jean-Jacques Muyembe-Tamfum



Pfizer Early Career Award
Dr Gordon Awandare



Rosalind Franklin Award 2015
Professor Lucy Carpenter



Milner Award 2015
Professor Thomas Henzinger



Milner Award 2016
Dr Xavier Leroy

Medals and awards

Copley Medal



The Copley medal for outstanding achievements in scientific research was first awarded by the Royal Society in 1731, more than 170 years before the first Nobel Prize.

Professor Peter Higgs CH FRS was awarded the Copley Medal for his fundamental contribution to particle physics with his theory explaining the origin of mass in elementary particles, confirmed by the experiments at the Large Hadron Collider.

Modern physics suggests that matter consists of a set of particles that act as building blocks and that between these particles lie forces that are controlled by another set of particles. A fundamental property of the majority of particles is that they have a mass.

In 1964, Peter Higgs proposed a theory about the existence of a particle that explains why these other particles have a mass. At the same time, yet separately, François Englert and Robert Brout proposed the same theory. The existence of the Higgs boson was confirmed by two experiments carried out at the Large Hadron Collider in 2012. The Nobel Prize in Physics 2013 was awarded jointly to Peter Higgs and François Englert.

The Copley Medal was first awarded by the Royal Society in 1731, 170 years before the first Nobel Prize. It is awarded for outstanding achievements in scientific research and has been awarded to eminent scientists such as theoretical physicist Stephen Hawking, DNA fingerprinting pioneer Alec Jeffreys and Andre Geim, for his discovery of graphene.

"Peter Higgs is a most deserving winner of the Copley Medal. I congratulate him. His work, alongside that of François Englert, has helped shape our fundamental understanding of the world around us. The search for the Higgs boson completely ignited the public's imagination, hopefully inspiring the next generation of scientists. The Copley Medal is the highest honour the Royal Society can give a scientist and Peter Higgs joins the ranks of the world's greatest ever scientists."

Sir Paul Nurse, then President of the Royal Society.



Image

Professor Peter Higgs CH FRS.

**Image**

Dr Gordon A Awandare, awarded the 2015 Pfizer Early Career Award for his achievements in molecular and cellular studies of malaria.

Medals and awards

Royal Society Pfizer Award

Since 2006, with the support of Pfizer Inc, the Royal Society has offered the Pfizer Award to recognise research scientists based in Africa who are making an innovative contribution to the biological sciences, including basic medical science, which contributes significantly to capacity building in Africa. In 2015, to mark the tenth anniversary of the Royal Society Pfizer Award, the programme was expanded to allow two awards: an Early Career Award for a research scientist at an early stage of his or her career showing exceptional promise; and an Advanced Award for an experienced top-level researcher that has made a significant and sustained contribution in both research and leadership.

Dr Gordon A Awandare was awarded the 2015 Pfizer Early Career Award for his achievements in molecular and cellular studies of malaria, including how malaria parasites invade red blood cells and cause disease. Professor Jean-Jacques Muyembe-Tamfum was awarded the 2015 Pfizer Advanced Award for his seminal work on viral haemorrhagic fevers, including Ebola, generating the foundation of our understanding of the epidemiology, clinical manifestations and control of outbreaks of these viral infections.



The Royal society
Pfizer Award
recognises research
scientists based
in Africa who are
making innovative
contributions to the
biological sciences.

In 2015/16 we celebrated the following outstanding achievements of our Fellows:

Nobel winner

Tomas Lindahl FRS won the Nobel Prize in Chemistry 2015 for mechanistic studies of DNA repair, sharing the Prize with Paul Modrich and Aziz Sancar.

“Understanding the ways in which DNA repairs itself is fundamental to our understanding of inherited genetic disorders and of diseases like cancer. The important work that Royal Society Fellow, Tomas Lindahl, has done has helped us gain greater insight into these essential processes.”

Sir Martyn Poliakoff, Vice-President and Foreign Secretary of the Royal Society.

Nobel winner

Professor Arthur B McDonald FRS won the Nobel Prize in Physics 2015 for the discovery of neutrino oscillations, which shows that neutrinos have mass, sharing the Prize with Japanese physicist Takaaki Kajita.

“Neutrinos are one of the fundamental particles which make up our universe and the important work that Royal Society Fellow, Arthur B McDonald has done has helped us reach a greater understanding of them.”

Sir Martyn Poliakoff, Vice-President and Foreign Secretary of the Royal Society.

Abel Prize

Sir Andrew Wiles FRS, best known for proving Fermat's Last Theorem, was awarded the 2016 Abel Prize by the Norwegian Academy of Science and Letters.

“In proving Fermat's Last Theorem, Andrew Wiles not only made a major mathematical breakthrough but he also captured the imagination of the public. A problem that had remained unsolved for hundreds of years combined with one person's lifelong pursuit of the answer. This is an inspirational story of a highly creative pursuit of knowledge driven by fascination with the unknown and the satisfaction of solving deep issues of profound significance.”

Professor Alex Halliday, Vice-President of the Royal Society.

**Image**

Professor Andrea Ghez, awarded the 2016 Bakerian Lecture for her acclaimed discoveries using the techniques of optical astronomy, pictured with Professor Alex Halliday, Physical Secretary and Vice-President of the Royal Society.



Supporting outstanding science

Through our funding programmes, we work in partnership with universities and industry, both within the UK and internationally, to support excellent scientists. Our Fellowships support scientists by providing the stability, freedom and flexibility needed for researchers to develop their ideas.

Left

Dr Ashleigh Griffin,
University Research Fellow,
University of Oxford.

Supporting outstanding science

In 2015/16 we supported

102

Sir Henry Dale Fellowships which are jointly funded with the Wellcome Trust to support outstanding postdoctoral scientists wishing to address an important biomedical question.

"Mentoring is a fantastic learning experience all round: I've learnt easily as much as I've been able to pass on."

Claire Spottiswoode (former Dorothy Hodgkin Fellow and now a mentor to a current Sir Henry Dale Fellow).

Early career Fellowships

Our early career Fellowships provide the next generation of scientific leaders with long-term support at an often pivotal point in their career. We have a number of Fellowship programmes that help achieve this, and in the year ending 31 March 2016 supported the following:

- 288 University Research Fellowships (URF) which provide up to eight years' support to outstanding scientists with leadership potential including 39 new appointments. New appointments included three researchers funded by Science Foundation Ireland.
- 102 Sir Henry Dale Fellowships which are jointly funded with the Wellcome Trust to support outstanding postdoctoral scientists wishing to address an important biomedical question. There were 29 new appointments.
- 35 Dorothy Hodgkin Fellows, including nine new appointments. This scheme supports outstanding early career scientists for whom career flexibility is essential. This scheme continues to benefit from support from the EPSRC, which funded two of the new appointments.

In 2015/16 we:

Worked to build greater diversity among our early career Fellowship holders by participating in initiatives such as SUSTAIN, organised by the Academy of Medical Sciences to provide mentoring and career development training for women researchers.

Developed our own mentoring scheme for Research Fellows in the first year of their Fellowship – of which Claire Spottiswoode (former Dorothy Hodgkin Fellow and now a mentor to a current Sir Henry Dale Fellow), says: "Mentoring is a fantastic learning experience all round: I've learnt easily as much as I've been able to pass on".

Continued to promote the message that our Fellowships allow for part-time working, sabbaticals and secondments and there is provision for maternity, paternity, adoptive or extended sick leave. We shared guidance on unconscious bias with all grants panel members.

Dr Ashleigh Griffin

University Research Fellow, University of Oxford

Dr Ashleigh Griffin started her career with a PhD on cooperative breeding in meerkats which has developed into a research programme into novel methods of treating bacterial infections in the face of growing antibiotic resistance. The common thread throughout has been the drive to understand how selection favours the evolution of cooperative behaviour – why should an individual help others at a cost to their own reproductive success? With the support of the Royal Society through a Dorothy Hodgkin Fellowship, and now a University Research Fellowship, she has had “the freedom to develop my research in imaginative and often surprising directions.”

How was the flexibility of the Dorothy Hodgkin Fellowship beneficial to you?

The most important thing about the Dorothy Hodgkin Fellowship is the way it validates the part-time working model as a way of doing scientific research. The Royal Society is saying “We know you might not be putting in the same hours, but we believe in your research ideas and want to help you achieve them”. It’s hard to put into words how important that was at certain points in my career.

What made you decide to apply for the University Research Fellowship (URF) and how did you find that application process?

First and foremost was the positive experience I’d already had as a Royal Society Research Fellow – I didn’t want it to end. I also knew I wanted to start working on clinical isolates of my study organism – the bacteria, *Pseudomonas aeruginosa* – but I really didn’t know if it was going to work. However, my track record showed that I could deliver and the Royal Society trusts its Research Fellows to work out a way of making things happen, or switch to a more promising line of research.

What support has the URF provided you in continuing to develop your research career?

Probably the most important support the University Research Fellowship has given me is time. One of my primary lines of research has involved clinical isolates from patients with cystic fibrosis. Building up such a collection takes time and wouldn’t have been possible in a standard duration three-year grant. Now, it’s all starting to come together. I have five PhD students, an ERC grant, and my URF has given me the freedom to keep up my work on meerkats and birds as well as bacteria.



Above
Dr Ashleigh Griffin,
University Research Fellow,
University of Oxford.

What our scientists say

"The University Research Fellowship provides me with the freedom to think creatively."

**Dr David Payne, URF,
Imperial College London**

"My University Research Fellowship has given me the freedom to set up a team doing the science that most excites me."

**Dr Gavin Morley, URF,
University of Warwick**

"My University Research Fellowship has given me the freedom and leverage to develop a substantial research programme, along with providing the underpinning security needed to build long-term research plans."

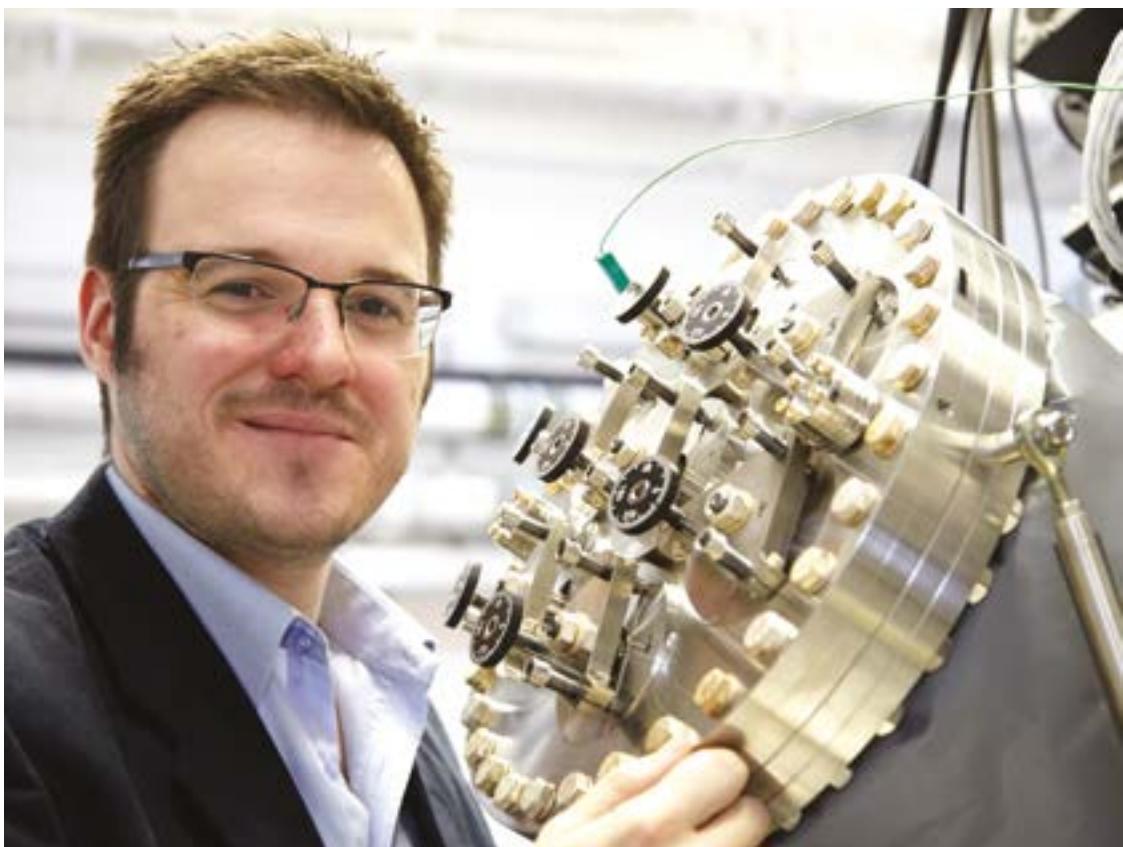
**Dr Michelle Moram, URF,
Imperial College London**

"Coming back from maternity leave can be daunting but having the support of the Fellowship and the Royal Society to be able to do the research and to be able to change my working hours has been invaluable. At some point I'm hoping that I'll have my own group and my agenda, so I do feel that this is the springboard to becoming an independent researcher."

Dr Elin McCormack, Dorothy Hodgkin Fellow, Rutherford Appleton Laboratory

Right

Dr David Payne, Royal Society University Research Fellow, Clean Energy Materials, Imperial College London.



Senior Fellowships

Our Senior Fellowships support established leaders in research with a view to retaining and recruiting outstanding scientific talent to the UK. As of 31 March 2016 we supported:

- 17 Research Professorships which provide up 10 years support for world-class scientists. There was one new appointment.
- 273 Royal Society Wolfson Research Merit Award holders, with 41 new appointments. These awards help universities attract or retain outstanding researchers in the UK through a salary enhancement.
- 7 Leverhulme Trust Senior Research Fellows were appointed. These seek to provide opportunities for academic researchers to be relieved of all their teaching and administrative duties, to enable them to concentrate on full-time research for up to one year.

Resources for research

We have a number of grants that help towards funding the equipment or facilities needed for excellent research to be carried out. In 2015/16 we awarded:

- 149 Research Grants of £15,000 to enable early career scientists to purchase small pieces of equipment and consumables to initiate new projects.
- 10 £150,000 Research Grants to University Research Fellows and Dorothy Hodgkin Fellows in the first year of their Fellowship.
- 6 Wolfson Laboratory Refurbishment Awards which provide up £250,000 to improve the existing physical infrastructure in UK laboratories. This scheme is funded by the Wolfson Foundation.

What our scientists say

"My Royal Society Research Professorship has allowed me to reduce my other academic commitments and refocus my research on a new and exciting topic at an internationally competitive level."

Professor Jean Beggs (Research Professor, University of Edinburgh)

"The [Wolfson Research Merit] Award is an excellent way for internationally based researchers to explore new research opportunities in the UK. The scheme helped me get established quickly and gives me a variety of both tangible and intangible benefits."

Professor Tetsuo Tomiyama who used a Wolfson Research Merit Award to support a move from Delft University of Technology, Netherlands to Cranfield University, UK

273

Royal Society
Wolfson Research
Merit Award
holders, with 41
new appointments.

In 2015/16 we awarded

149

Research Grants of
£15,000 to enable
early career scientists
to purchase small
pieces of equipment
and consumables to
initiate new projects.

Professor Gregory Hannon

Research Professor



Above

Professor Gregory Hannon,
Research Professor.

Professor Gregory Hannon is a world leader in the study of RNA interference (RNAi). RNA (ribonucleic acid), like DNA, is an important molecule vital to all living beings. Professor Hannon's research broadly focuses on how cells are able to turn genes on and off, and he has played an instrumental role in developing our understanding of how molecules known as small RNAs are involved in gene regulation. His research has important implications for cancer research as understanding RNAi mechanisms adds depth to our knowledge of how cancers develop and could potentially lead us towards identifying new therapeutic targets.

Professor Hannon was recently awarded a Royal Society Research Professorship which helped to bring him to the UK after over 20 years at Cold Spring Harbor Laboratory (CSHL) in the USA. He started his Professorship at the University of Cambridge in June 2015 where he is based at the Cancer Research UK Cambridge Institute. The institute provides an ideal environment for Professor Hannon to explore and develop lines of research relating to breast and pancreatic cancer, two current focuses of his work.

Why did you decide to move to the University of Cambridge?

I loved my time at CSHL. It was an incredible place to start my career and having stayed there for 23 years, I appreciate its unique features. It is nimble in a way that I have never seen at another institute and the leadership and functioning of the lab is all about promoting the science. But after such a long time in one place, I felt that I would benefit from new colleagues, new interactions, and new challenges. It's like pruning our fruit trees at our house near Cambridge, cutting some ties encourages new growth. I have found new colleagues and new directions here. But perhaps most importantly, my lab is smaller, both by legislation and design, and I have so much more time for thinking about each project, each person. Though I had to learn a lot regarding the practicalities of the move, I think it will have a transformational impact on our science.

Has your Royal Society Research Professorship enabled you to spend more time on your research than would have been possible without it?

To be completely honest, I'm not sure what would have happened without the Royal Society Professorship. It was certainly a validation by the community that I was welcomed. I have so much more time here for research, but that might have happened with or without this award – I simply don't know. What I can say for sure is that I am having much more fun doing science than I have had for a very long time. I always said that it had soaked into the mortar and the brick that built CSHL that only excellence mattered. But in Cambridge, I feel that can carry that understanding, that tradition forward and get my hands dirty again. I love the workmanlike aspects of science and I know how important that is to be in the lab – not disconnected from those doing the 'real' work. The Royal Society Professorship lets me engage my students, postdocs, and more senior researchers at a level of detail which was simply not possible before.

With regard to developing an even deeper understanding of small RNAs, what do you hope your lab will achieve over the course of your Professorship?

We, I think, have a broader research mission. Regarding small RNAs, we are intensely interested in how they function to protect germ cell genomes. We want to understand this entire pathway from the genetic level of how elements interact to the structural level of how elements act. This is a fundamental piece of biology, without which none of us would be here. But we are also interested in cancer, in the function of non-coding RNAs more broadly, and in the development of new technologies. I know that the Royal Society Professorship gives me the opportunity to pursue some of these aims, but my true hope is that exposure to my Royal Society Professorship colleagues will give me new insights, new resources. Jim Watson once told me that you never want to be the smartest person in the room. That's easy for me in Cambridge.

"To be completely honest, I'm not sure what would have happened without the Royal Society Professorship."

**Above**

Attendees at the *Future of Scholarly Scientific Communications* meeting, 2015.

Below

Royal Society journals.

Publishing

To coincide with the 350th anniversary of the publication of the world's first scientific journal, *Philosophical Transactions of the Royal Society*, we organised a series of meetings in early 2015 to look at the future of scholarly communications. This was in recognition of the fast-changing world of publishing including the ongoing development of digital technology and a move towards more open data. Our publishing activities continue to reflect these changes.

In 2015/16 Royal Society Publishing article downloads exceeded

24 million
for the year. This represents a growth of almost 50% on the previous year.

In 2015/16 we:

- Signed up to an international agreement to ensure everything published on the Zika virus in our journals will be openly available – part of a wide-ranging effort to make all data on the virus available to researchers as quickly as possible.
- Supported accessibility – 30% of our total published output is now open access.
- Began a programme to produce a complete, digital archive of the Society's journals – overseen by a steering group of Fellows and other experts in the history of science. For the first time we will hold a digital copy of these valuable assets, making them widely available for general readers and specialist researchers. The first phase (750,000 pages of published materials) is scheduled for completion in March 2017.

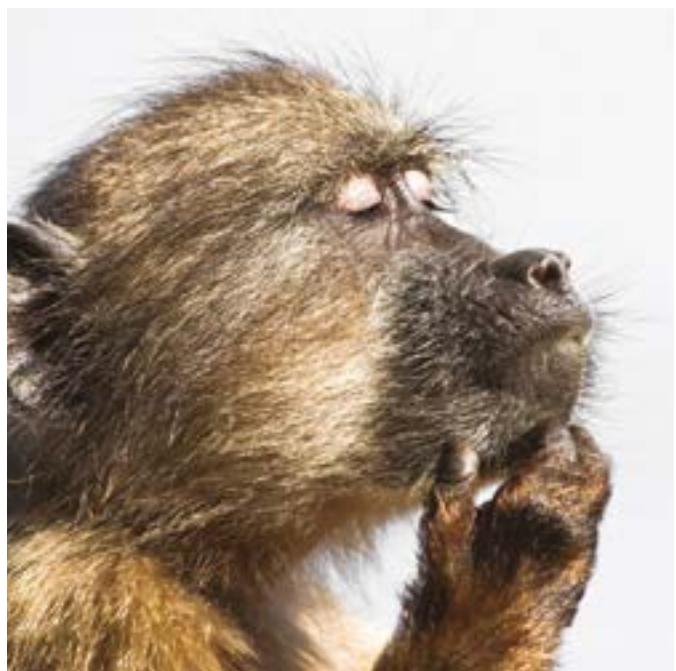
The Royal Society journals

For information on all our journals visit
royalsociety.org/journals



Life through a lens

Our first photography competition launched in 2015, highlighting the power of photography to communicate science and engage with a public audience. In 2016, the competition has been extended to all the Society's biological science journals.



Clockwise from top left
The Royal Society
photography competition:
Special commendation,
Fish louse by Steve
Gschmeissner, UK;
Category winner, *Going
with the flow: schooling
to avoid a predator*,
by Claudia Pogoreutz,
Germany; Overall winner,
Tadpoles overhead by
Bert Willaert, Belgium;
Special commendation,
*A baboon gets lost in
his thoughts* by Davide
Gaglio, South Africa.



Providing scientific advice for policy

We strive to ensure that policy-makers have access to expert, independent scientific advice, whilst extending the reach, impact and influence of our policy work with UK, European and international decision makers.

Left

Emma Woods of the Royal Society at the UN Framework Convention on Climate Change, Paris 2015.

Providing scientific advice for policy



Above
Resilience to extreme weather report, 2014.

In 2015/16 areas of focus included:

Machine learning

A powerful technology that allows machines to learn from data and self-improve, machine learning is the subject of our latest major policy project. Already used in internet search engines, email filters to sort spam and websites to make personalised recommendations, it has potential applications which could contribute to the UK economy and have a significant impact on society. The technology could provide us with readily available ‘personal assistants’ to help manage our lives, it could improve the transport system through the use of autonomous vehicles, and it could contribute to the healthcare system by personalising treatment or improving disease diagnosis. Our project aims to ensure that independent expert advice is available to inform policy-making as the technology and its applications, develop. As part of our efforts to involve the public more directly in influencing policy work, the project has sought from an early stage to establish an evidence base for public views on machine learning and is working with Ipsos MORI to conduct public dialogue around the subject.

Cybersecurity

We are looking at the cybersecurity research challenges emerging over the next five to ten years and the policy frameworks needed in the UK to tackle them. The recently published project report, delayed due to the wide-ranging and complex nature of the work, has brought to the fore issues related to data governance that will be treated in a separate policy project.

Genetically modified (GM) plants

We have developed a set of questions and answers and other materials to provide information about the science behind GM. We asked Ipsos MORI to run a series of focus groups to ascertain what questions should be covered and a group of experts was engaged to write the answers. The questions and answers are accompanied by a series of digital communications to support public understanding of the science behind GM plants and open up debate on the issue. All of the information is designed to be factual, neutral and appropriate for a non-expert audience.



Right
Caterpillars feeding on cabbages. Taken from GM questions and answers.
© Sophonibal.

Resilience

2015 saw the agreement of three major United Nations (UN) policy frameworks on disasters, sustainable development and climate change and we continued our work to increase people's resilience to extreme weather (following our *Resilience to extreme weather* report, published in November 2014), and to communicate the science of climate change to the public and policymakers.

Our work informed the development of the UN frameworks and will continue to support their implementation. Work around UK flooding and city resilience will continue in the coming year and some of the *Resilience to extreme weather* report's recommendations (such as advancing climate modelling) were intended to have long-term impact and we will see further developments into next year and beyond.

"It was very gratifying to see the work we did reflected in several scientific and policy reports that emerged over the year. Most notably, the report's recommendations were reflected in the text of the Sendai Framework for Disaster Risk Reduction, drawing out the importance of science in this ever-more crucial area of international policy. Our analyses have also been used in other research, for example in two recent Lancet Commission reports on environment and health.

It was very pleasing that at the end of 2015 we could look back and see these international frameworks in place: this was by no means a certain outcome at the beginning of 2015. These frameworks were always a focus for our work, and at times it seemed that it was going to be very hard for our science to influence them in any meaningful way. The frameworks collectively put in place a robust international vision for dealing with challenges like extreme weather. They acknowledge the important role of science, which is good to see."

Georgina Mace FRS, resilience project chair.

Genome editing

Genome editing could become one of the most talked about areas of science in the coming years as the speed, ease of use and accuracy of new techniques expand the horizons of where the method could be used. In December 2015 we joined with the American and Chinese national science academies to co-host an international summit that brought together the world's leading scientists in the field of human genome editing. We will continue to be active in ensuring that public views inform how genome editing techniques are used in practice, and how these applications are regulated to earn and maintain public trust.



© Tomáš Šereda

The Vatican was a new audience and partnered in our work on climate change in 2015. In June Pope Francis published an encyclical (a letter to Catholic bishops worldwide) on the environment and human responsibility. We prepared a set of 'FAQs' for the global network of Catholic bishops, to help them answer any questions that arose in response to the Pope's encyclical.

"The UK must not jeopardise its position as a world leader in science and the associated prospects for long-term prosperity in the name of short-term savings."

Sir Paul Nurse,
then President of
the Royal Society

Research landscape

The Royal Society's aim is to create the best possible environment for research and innovation in the UK. Together with our partner academies – the Academy of Medical Sciences, the Royal Academy of Engineering and the British Academy – the Society's work towards the UK Government's Spending Review helped to achieve a positive outcome for research: Government is protecting science resource funding at its current level of £4.7 billion per year, which will rise in cash terms every year, for the rest of this Parliament. There is also a new £1.5 billion investment over five years (2016/17 – 2020/21) in a new Global Challenges Research Fund, to ensure UK research takes a leading role in addressing the problems faced by developing countries. While this settlement does not meet the challenge set by the Society for the Government to commit to 0.67% (OECD average) of its budget to research and development by 2020, it is clear that the outcome for science compared favourably with most other areas of government spending.

"The UK must not jeopardise its position as a world leader in science and the associated prospects for long-term prosperity in the name of short-term savings. The Government is committed to making the UK the best place in the world for science and business, world-class research and innovation – in order to achieve this, the Government needs to increase investment in R&D over the next five years from 0.49% of GDP to at least matching the OECD average of 0.67% of GDP by 2020."

Sir Paul Nurse, then President of the Royal Society, reacting to publication of the House of Commons Science and Technology Select Committee report calling for increased UK science funding.

EU budget

In early 2015, the then President of the Royal Society, Sir Paul Nurse, led a group of Nobel Laureates in opposing the threat of cuts to the EU research budget. We contacted European Parliamentarians who were also opposed to the planned cuts. In June 2015 a delegation of the Nobel Laureates, including our President, met with Commission President Jean-Claude Juncker and Commissioners Katainen and Moedas and as a result a compromise was reached that saw €500 million of the planned cuts returned to the research budget. The outcome also saw the European Research Council protected from potential cuts.



UK research and the EU

Europe is home to world-class research and changes in the UK's relationship with the EU could impact on research. The Society is conducting a phased project gathering evidence about the influence of the UK's relationship with the EU on research to inform public debate.

High-quality science advice is essential for the development of effective policies in many areas and the Society is stepping-up significantly its work to provide such advice. Our work will be organised under broad themes including the research landscape, education, data, resilience, well-being and emerging technologies; working in this way will allow us to draw on the expertise of a greater number of our Fellows.

Above

Europe from space.
© MarcelC.



Fostering international and global cooperation

Science is an international activity and we are strengthening links with academies, funders and governments in Europe, the United States and beyond as well as supporting other countries who are building their own scientific strength.

Left

The Royal Society hosted a second bilateral conference with South Korea's Institute for Basic Science in September 2015.

Fostering international and global cooperation

In 2015/16 areas of focus included:

The Newton Fund

This year one of our main areas of work has been the Newton Fund. This programme allows us to develop science and innovation partnerships between the UK and Newton Fund countries, on the basis that through training and collaboration we can support a well-trained research community with the ability to conduct high-quality research. This will promote the economic development and welfare of developing countries and help ensure the UK engages with the world's most promising academics.

The Fund was launched in 2014 and originally consisted of £75 million each year for five years. In the 2015 UK Spending Review it was agreed to extend the Fund from 2019 to 2021 and expand it – doubling the £75 million investment to £150 million by 2021.

As one of several Newton Fund delivery partners we work with funding agencies overseas to secure partners that can provide a matched level of funding for further collaboration. We have reached agreements with the following partners:

- Brazil – CONFAP (The Brazilian Council of State Funding Agencies)
- China – Natural Science Foundation of China and Chinese Academy of Science
- India – Science and Engineering Research Board

- Malaysia – Academy of Sciences Malaysia and the Malaysian Industry Government Group for High Technology
- Mexico – CONACYT and the Mexican Academy of Sciences
- South Africa – National Research Foundation
- Thailand – Thailand Research Fund and Office of the Higher Education Commission (Thailand)
- Turkey – TUBITAK (Scientific and Technological Research Council of Turkey)

Through the Newton Fund we made the following awards in the year ending 31 March 2016:

- 23 Newton International Fellowships. These attract the best early-stage postdoctoral researchers from around the world to UK research institutions. They are run in partnership with the British Academy and cover the natural and social sciences, engineering and the humanities, and the Academy of Medical Sciences also contributes.
- 46 Newton Advanced Fellowships. These provide established international researchers with an opportunity to develop the research strengths and capabilities of their research group by providing up to £111,000 over three years towards training, collaboration and reciprocal visits with a partner in the UK.
- 41 Newton Mobility Grants which provide funding for scientists overseas who want to undertake a collaboration with a scientist in the UK and it offers funding for a one-off visit or bilateral travel.

In addition to those appointed with support from the Newton Fund, the Royal Society awarded a further 26 Newton International Fellowships from its core funding to individuals from 14 different countries and provided support for 39 Fellowship alumni in 22 different countries. Our Fellowship portfolio benefitted from additional support from the Kohn Foundation (in partnership with the Israel Academy of Sciences and Humanities) which has resulted in the first Royal Society Kohn International Fellow being awarded to an Israeli researcher.

We supported two additional awards for Chinese researchers thanks to support from The Sino-British Fellowship Trust (SBFT) and the K C Wong Foundation. The grant awardee of the SBFT for 2015 is Mr JiaWen Zhang who is undertaking research concentrating on 'Finite decomposition complexity and related topics' in collaboration with colleagues at the University of Southampton.

The Society, with the support of Professor Yuet Wai Kan FRS, also awarded three new Kan Tong Po Visiting Fellowships (established in memory of Mr Kan Tong Po), for visits between the UK/USA and Hong Kong.

What our scientists are doing

Research funded through the Newton Fund in the past year has ranged from the development of promising new approaches that could help in the protection of tooth decay (Newton Advanced Fellowship held by Professor Marília Buzalaf, University of São Paulo in collaboration with Professor John Michael Edwardson at the University of Cambridge), to laboratories tackling the formation, growth and ageing of atmospheric aerosol properties, with a view to helping to resolve air pollution issues in China (Newton Advanced Fellowship held by Professor Lin Wang, Fudan University, China and Professor Hugh Coe, University of Manchester).

It has also led to a collaboration supporting a combined textural and geochemical study of Popocatépetl volcano in Mexico (Newton Mobility Grant held by Dr Julie Roberge, ESIA- Ticomán, Instituto Politécnico Nacional (IPN) Mexico and Dr Alison Rust, University of Bristol) and investigations into novel approaches to the design of multitargeted drugs to treat endemic cancers (Dr Pingyu Zhang received a Newton International Fellowship to travel from China to work on this in the UK at the University of Warwick with Professor Peter Sadler FRS).

Dr Feyza Kazanc

Newton Advanced Fellow, Middle East Technical University, Turkey



Above
Dr Feyza Kazanc
Newton Advanced Fellow,
Middle East Technical
University, Turkey.

Clean combustion technologies are of extreme importance nowadays due to major environmental, energy consumption and economic concerns. To address some of these issues, I have established a research group as well as a laboratory in Middle East Technical University (METU), Turkey, to focus on the combustion of solid fuels on a low-medium scale. In particular, my group investigates how to utilise energy resources found in Turkey (such as lignite reserves) and we are looking into how to increase the burning efficiency of these resources and also decrease their pollution effects.

The Newton Advanced Fellowship has provided me with a good opportunity to establish a network with researchers in the UK in the field of Carbon Capture and Storage (CCS). The award has helped me to strengthen my collaboration with my colleague in the University of Edinburgh, Dr Juan Riaza.

I first met Dr Riaza during my doctoral studies in Northeastern University, Boston, USA and he later studied in my laboratory as a visiting researcher during his doctoral studies in Spain. This award has helped us to develop this collaboration further, and it has enabled me to go to Edinburgh to do research for a month during the first year of the Fellowship, where we had several fruitful discussions with both Dr Hannah Chalmers and Dr Riaza.

I am going to use the training budget in this award to visit an oxy-fuel pilot plant in the UK and be trained at a large scale oxy-fuel combustion facility. Moreover, I plan to build a data monitoring system for my laboratory and I would like me and my group to be trained on the use of control and data acquisition equipment and software.

In the next year, I plan to finish building the suggested experimental set-up proposed as part of this project in my laboratory at METU. I would also like to participate in the International Combustion Symposium in Korea to present data from this project.

I also hope to establish more collaborations with colleagues in the UK by visiting the University of Sheffield to meet research groups there working on clean combustion technologies, to whom I have been referred to by my collaborators in Edinburgh.

Other international awards

We have a number of other grants to support international collaborations and in the year ending 31 March 2016 these included:

- 171 International Exchanges for scientists in the UK who want to undertake collaboration with scientists overseas through either a one-off visit or bilateral travel. We have achieved greater benefit for recipients through cost share agreements that have been established with organisations in Russia (RFBR), China (NSFC), France (CNRS), Ireland (RIA) and Taiwan (MOST). Further funding has also been achieved for potential applicants in sub-Saharan Africa through a new collaboration agreement with the Royal Society of Chemistry. We also awarded four Colin Pillinger awards which are international exchanges providing additional funding for public engagement.
- 20 awards were made through the International Scientific Seminar Scheme that allows Royal Society Research Fellows to organise a small two-day scientific seminar at the Kavli Royal Society International Centre.
- 27 Commonwealth Science Conference follow-on grants to promote continued collaboration between participants of the conference, held in Bangalore in 2014 (see page 65 for more information).

What our scientists are doing

International Exchanges Scheme

Dr Ashley Cadby was awarded an International Exchange to support his proposal to bring together the complementary expertise of his research group at the University of Sheffield with the Jun group at the University of California, San Diego (UCSD). The Jun group have developed the 'Mother Machine' a microfluidics system capable of imaging single bacteria over many generations. The goal of this collaboration is to develop super resolution imaging and spectroscopy systems with the capability of studying large numbers of single bacteria.

The grant will support travel for up to three PhD students in Dr Cadby's group in order to gain expertise in the hardware and software development of various microscopy techniques with a leading group at UCSD with a view to employing similar technology in the UK. Dr Cadby and his group have planned for visits in the first half of 2016 and it is hoped that the funding will lead to a lasting collaboration. The super resolution techniques developed will provide new insights into how bacteria adapt to their environment at the single bacterial level.

Dr Cadby says: "This award allows me and my students to work closely with a world-leading group in the study of bacterial growth, we can now apply our imaging techniques to study colonies of bacteria growing over many days."

Right

Professor Martin Broadley's Royal Society-DFID programme grant supports research in sub-Saharan Africa.



Capacity strengthening

We continue our long history of promoting science in Africa through support of collaborations between UK and African scientists and other initiatives that support the strengthening of scientific capacity. In the year ending 31 March 2016, we supported:

- 10 Royal Society-DFID Africa Capacity Building Initiative Programme Grants, including five new awards that were made this year. These grants provide up to £1.243 million to support consortia consisting of three African research groups and one UK-based laboratory for a five-year award period. They are the result of support from the Department for International Development (DFID) that has provided £15.3 million towards this initiative.
- 17 Leverhulme Royal Society Africa Award holders. This scheme provides support for UK-Ghana and UK-Tanzania research collaborations but this scheme has reached the point where no new awards will be made.
- The Royal Society Africa Exchange Programme made five awards of £21,000. The awards will cover travel and subsistence to support training and research costs for collaborations between researchers in the UK and Africa.

What our scientists are doing

Royal Society-DFID Africa Capacity Building Initiative: programme grants

Professor Martin Broadley started his Royal Society-DFID programme grant in January 2015. This award provides over £1.2 million over five years towards the development of research consortia in sub-Saharan Africa. Professor Broadley is working with scientists in soil geochemistry, agriculture and nutrition from Malawi, Zambia, Zimbabwe, and the UK. This consortium aims to increase knowledge and strengthen capacity through three core PhD studentships that encompass analytical chemistry, geospatial sampling and data analysis, soil management and vocational skills, including research ethics. The studentships started in September 2015 and two further part-time PhD studentships are already linked to the network. Understanding soil geochemical processes is essential to support policies in agriculture and public health (including identifying people at risk of mineral deficiencies and toxicities). The consortium aims to build on its work over the next year and is looking towards its longer-term sustainability by attracting additional funding and students to register for doctoral studies in sub-Saharan Africa.

"The first year of this project has been a hugely rewarding experience", according to Professor Broadley. "A particular highlight was our first network meeting in Harare in September 2015. It was a major team effort, which saw students, technical staff, and academics from all of our University and Research Institute partners come together for training activities, supervisory meetings, project planning, and to engage with capacity strengthening activities. Scientific highlights to date include Muneta Grace Manzeke, studying for her PhD at the University of Zimbabwe, winning a prestigious international prize in the area of crop nutrition for her work on smallholder farming systems in Zimbabwe. Grace was also invited to present her research at an international conference in Brazil in October.

In a wider context, by seeking to strengthen doctoral training capacity in sub-Saharan Africa, the Royal Society-DFID programme is supporting what I believe is a fundamental component of sustainable international development. It is a privilege to have the opportunity to use our research and training interests to contribute to this wider process. In addition to our scientific research, we are immensely excited at the wider capacity strengthening opportunities for individuals and institutions from our network."



Above
The Biological and Toxin Weapons Convention report, 2015.

Other international activities in 2015/16 included:

- **President's visit to India**

In January 2016, Sir Venki Ramakrishnan, President of the Royal Society, delivered the Rutherford Memorial Lecture on *The use of recent advances in electron microscopy to study ribosome structure* in Delhi. The Society's ongoing aim is to help promote greater UK-India scientific collaboration and over the next three years we will focus on consolidating our partnership with Newton Fund delivery partners.

- **Royal Society and South Korean Institute for Basic Science conference**

In September 2015 we brought together leading UK scientists with their Korean counterparts in three research fields: nanoscience and nanotechnology, particle physics and astronomy, and genome science.

- **Launch of the Academy of Sciences of Hong Kong**

In December 2015 we participated in the launch of the world's newest science academy, the Academy of Sciences of Hong Kong.

- **Biological and Toxin Weapons Convention**

In September 2015 we joined the InterAcademy Panel (IAP), the US National Academy of Sciences and the Polish Academy of Sciences in Warsaw to discuss new developments in science and technology that impact the Biological and Toxin Weapons Convention.

- **2016 G-Science Academies meeting**

The Society participated in the G-Science academies meeting of the G7 and other countries at the Science Council of Japan in Tokyo in February 2016. We joined forces with the other academies in highlighting three global challenges that science ministers from the G7 countries needed to address at the G7 Heads of State summit in Japan in May 2016. They were understanding, protecting and developing global brain resources, ensuring sustainable development by strengthening disaster resilience, and nurturing scientists for the future.

As well as the potential expansion of the Newton Fund, the Society will be working with the Department for Business, Innovation & Skills (BIS) and our partner national academies to introduce activities to be funded through the new Global Challenges Research Fund. This new work will aim to tackle some of the major issues threatening the developing world.



We are also delighted to be working with the National Research Foundation of Singapore on the next Commonwealth Science Conference which will take place in Singapore in June 2017. The last Conference in Bangalore in 2014 saw more than 30 of the 53 Commonwealth states represented and our aim is to expand on that representation in 2017. The theme of the 2017 conference will be resilience and will embrace many common issues faced by Commonwealth countries including infectious diseases, low-carbon energy and sustainable cities.

In the coming year the President of the Royal Society, Sir Venki Ramakrishnan will visit countries including the USA, France, Germany, China, South Korea and Mauritius.

Above
Meeting on trends in Science and Technology relevant to the Biological and Toxin Weapons Convention Warsaw, September 2015.



Education and public engagement

Science is central to modern culture and the Society is committed to increasing opportunities for everyone to engage with science, both through the formal education system and in other ways.

Left

Fulford School, York,
recipient of a Royal
Society Partnership Grant.

Education and public engagement

This year we funded projects in solar physics, renewable energy, and conservation and plant science; awarding 39 grants to schools across the UK totalling

£88,037

(an increase from last year's 28 grants totalling £58,947).

In February 2016, we held a conference for secondary schools and colleges that were awarded their Partnership Grants in 2015. Students presented their projects orally and in a poster session, with the poster session attended by external visitors including MPs, Fellows and Research Fellows.

Education policy

The Society's *Vision for Science and Mathematics education* sets out how, over the next 20 years, we will work towards raising the general level of mathematical and scientific knowledge and confidence in the population. Our recommendations include: ensuring that young people study maths and science up to the age of 18 years; better management of curriculum change; supporting a strong supply of maths and science teachers; demonstrating the potential of science and maths careers and ensuring that exams are not the only measure of performance. While the Government has announced a commitment to extending maths education to 18 years, we recognise that there is still much to be done to ensure that the *Vision* recommendations are implemented.

In 2015/16 areas of focus included:

Working with leading figures in industry to develop a 'guide' for businesses wanting to work with schools and colleges to support the teaching of science, computing, engineering and mathematics in collaboration with the Confederation of British Industry.

- Our Education Research policy study with the British Academy will work to ensure education policy is better informed by evidence. It will analyse evidence on the structure, status and funding of education research in the sciences, mathematics, social sciences, arts and humanities to provide advice on ways in which education research in the UK can be strengthened.
- Together with the Education Endowment Foundation, we are investigating ways to improve science results for disadvantaged students in primary and secondary schools across England.

The Advisory Committee on Mathematics Education (ACME)

Recognising the increasing need for more mathematics teachers across all ages, ACME is working to support a shared understanding of what trainees need to become effective teachers.

In November 2015 ACME published a report on the initial teacher education (ITE) of maths teachers. *Beginning teaching: best in class?* looks at what is needed to ensure they receive high-quality training. ACME will hold a series of meetings and events over the coming year to encourage collaboration between ITE providers, learned societies and others in order to improve the supply of teachers of the subject.

Education outreach

Alongside our education policy work we have an active education outreach scheme which includes grant programmes and the provision of training for Royal Society funded researchers who wish to work with schools.

Partnership Grants

Our Partnership Grants scheme provides grants of up to £3,000 for science, engineering or mathematics projects run at a primary or secondary school or college in partnership with a STEM professional, and we awarded 39 in 2015/16. These grants aim to inspire young people by giving them the experience of being a practising scientist, mathematician, computer scientist or engineer. This is the flagship scheme of our wider work encouraging science to be taught as a creative, open-ended, investigative subject and takes forward the Society's *Vision* recommendation that the amount of time and money invested in practical and problem-solving work in science and mathematics should be increased.

Partnership Grants in action

Biotechnology – from gene to product, Fulford School, York



Students aged 16 – 17 from Fulford School, York worked with Adrian Harrison at the University of York to genetically modify bacteria to produce fluorescing bacteria and to investigate which growth conditions were the most effective.

They delivered a series of primary school sessions in their school to over 100 students from four different primary schools. They confidently taught students aseptic techniques, took them on a tour of the school to sample microbes in different areas, grew microbes from the natural environment, encouraged the primary students to select appropriate growth conditions for yeast and taught them how to use microscopes.

What our teachers and students say

“Without funding such as this these students would not have been able to participate in such an exciting project – it is one which only lasted days but they will remember all their life. While this sort of impact is not easily measurable the attitude of the students involved towards science will be a positive one and the hope is that while some may no longer study science, they will continue to engage with the science in the world around them.”

Holly Williams, teacher at Fulford School

“I enjoyed passing on the skills we had learnt to the primary students. I liked demonstrating the techniques we had learnt and helping them try them. I especially enjoyed taking them to take samples around the school, because I think they enjoyed choosing areas to take samples, as well as seeing how our school was different to their own.”

**Student at Fulford School
(from anonymous feedback)**

“The children really enjoyed coming to your school and working with the older students. They were very interested in the topic and enjoyed learning more about microbes and collecting the samples. We looked at the results yesterday and the children were fascinated with what they found, and this prompted a lot of good scientific discussion. It also made them think about washing their hands more often!”

**Teacher of local primary school
(from anonymous feedback)**

Left

Student from Fulford School, York, part of a Royal Society Partnership Grant.

What's the weather like?

The Mead Community Primary School, Trowbridge

Alex Purcell, a flood defence engineer from Black & Veatch, has been working with 9 – 11 year old students at the Mead Community Primary School, Trowbridge, to monitor their local weather and make predictions based on data analysis. Alex says the project is “Encouraging children to go out and engage with the weather and climate – come back in and assess the data and see the power of looking at a sea of numbers and spotting patterns and being able to forecast using patterns.”

The funding has provided the school with a weather station which produces plenty of data on rainfall, temperature and wind speed. They are tracking this data over a long period of time and looking at how predictions can improve with an increased quantity of data. For Mel Jacobs, a governor at the school, the data collection and analysis is key: “[A] snapshot in time doesn’t help you draw conclusions or could draw wrong conclusions, so we’ve worked with the children to get them to understand why we need so much data, why we can’t just collect it once.”



Left
Students from The Mead Community Primary School, Trowbridge, part of a Royal Society Partnership Grant.

Public engagement

Our public programme aims to inspire the nation about science – we organise a series of events, both at our London premises and across the country that are free and give the public the opportunity to hear from and engage with scientists about novel research, science issues and the history of science.

In 2015/16 our public programme:

- Reached more than 23,000 people
- Encouraged new visitors – 55% of visitors came for the first time
- Enjoyed a high level of satisfaction from its audience (90% of feedback is positive)
- Increased 30% since 2014.

2015/16 activities included:

Summer Science Exhibition

Our flagship public engagement event is held every year in the first week of July with 22 exhibits of cutting-edge science and technology on show from all around the UK. In 2015, 13,000 people visited the exhibition, with the opportunity to talk to the scientists doing the research, enjoy hands-on activities and attend interactive talks. The exhibits covered subjects as varied as face recognition technology, cancer research, the science behind Richard III's archaeological discovery and particle physics.

The Summer Science Exhibition embodies our public engagement approach to give members of the public the chance to engage with exceptional scientists – it displays the best of UK science and technology to a broad audience.

What our visitors say

- **81% of respondents** to our feedback survey strongly agreed or agreed that the exhibition had increased their interest in science.
- **85% of visitors** strongly agreed or agreed that the exhibition had given them the opportunity to discuss research with practising scientists.
- **80% of respondents** either strongly agreed or agreed that they now had an increased understanding of how science affects our daily lives.
- **62% of all visitors** attended for the first time and families were especially well represented this year.

“In 20 years, this is the best exhibition I have been to.

Fantastically organised and a real range of exhibitors and visitors.”

“In 20 years, this is the best exhibition I have been to. Fantastically organised and a real range of exhibitors and visitors.”

“I come here every year and every year, my jaw gets dropped.”

“That was the best day of my life for a long time!”

On leaving the school talk, one student said, “That's what I want to do with my life.”





Images
Summer Science
Exhibition, 2015.

3,500

attendees at the
Science Museum
'Lates' in June 2015,
a new audience for
the Royal Society.

Book Prizes

The Royal Society Winton Prize for Science Books

This Prize celebrates the very best in popular science writing and has grown to become one of the UK's most prestigious non-fiction literary prizes. It recognises books that make science accessible, that are a pleasure to read and that are enlightening, creative and stimulating.

Young People's Book Prize

Each year we celebrate the best books that communicate science to young people through our Young People's Book Prize – designed to inspire young people to read about science and promote the writing of excellent, accessible books for under-14s. This year we received 40 entries from 25 publishers and *Jake's Bones*, a shortlisted book from this year's Prize, was the first book in the competition's history written by a child. The anonymous donor that generously supported the Prize for the last five years has agreed to support it for a further five years and will be supporting an expansion of the Prize, which will include a more specific targeting of young people from under-privileged backgrounds.

Meet the scientists

We offer our Research Fellows training, opportunities and recognition for engaging the public with their research and with science through our *Meet the scientists* programme. This underpins our commitment to give the public the opportunity to engage with excellent scientists and allows us to work with scientists all over the UK. In 2015 we appointed our first Professor for Public Engagement in Science, Professor Brian Cox FRS, to work with us on a number of initiatives including a series of policy debates and a history of science series. This is part of our wider grass roots programme to involve the UK's best scientists in public engagement.

What our scientists say

"I would like to thank you and your team for organising this great event. I very much enjoyed the preparation and the interaction with the public. I can only recommend participating in such events."

"I'd like to thank you and the team at the Royal Society for the opportunity to take part in this event. It was a brilliant experience for everyone in my team, and very much a bonding experience for us all. We were bowled over by the interest shown in our research and the generally 'up for it' attitude of the 'Lates' audience."

"The whole experience has left us inspired about engaging the public more in our research and we're talking about adapting our exhibit for local school events."

Research Fellows talking about the 'Lates'

The Royal Society Winton Prize for Science Books



In 2015, Gaia Vince became the first woman to win the prize as a sole author in the Prize's 28-year history for *Adventures in the Anthropocene*, a close-up look at the most pressing ecological issues facing the planet, and the people who are using science to solve them.

Adventures in the Anthropocene explores how the Earth has been drastically affected by humans, but also the ways in which science and engineering are providing solutions, from islands built out of rubbish to artificial glaciers. Vince's research from around the world illustrates the increasingly popular argument that, due to human activity over just a couple of centuries, we have altered the planet so much that our geological period has rapidly changed. Having left the 12,000-year-long Holocene epoch we are entering into a distinctly new age, the Anthropocene.

"This is an under-reported area of science and a truly original story. We were all humbled by Vince's commitment to this book – she quit her job and spent 800 days on the global road to gather her evidence. She has captured the issue of the day in a way that is ultimately empowering without ever being complacent. We are very proud to recognise this ambitious and essential work."

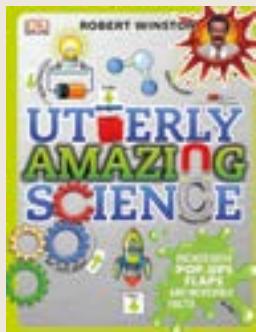
Chair of judges, Professor Ian Stewart FRS.



Above
Adventures in the Anthropocene
by Gaia Vince won the Royal Society Winton Prize for Science Books, 2015.

Left
Gaia Vince with Professor Brian Cox FRS, holding her book *Adventures in the Anthropocene*, winner of the Royal Society Winton Prize for Science Books.

Young People's Book Prize



Above
Utterly Amazing Science by Robert Winston won the Royal Society Young People's Book Prize, 2015.

Right
Students at the award ceremony for the Young People's Book Prize at the Eden Project in Cornwall.



Our Young People's Book Prize's award ceremony was traditionally held at the Royal Society and aimed at adults and publishers.

Two years ago we decided to transform it to a celebration for young people, which would be held outside London. This year, the award ceremony, hosted by Children's BBC presenter Katie Thistleton, was held at the Eden Project in Cornwall in November 2015. The winning book was announced in front of an audience of 175 students from six different schools from the local area.

"It truly was a fantastic day and was so well planned and very child appropriate. The workshops were fun and informative. I also really liked the opportunity for the children to have the chance of a very professional awards ceremony. The children really enjoyed the day and got lot of positive things out of it."

Teacher and ceremony attendee

"This book is scientifically awesome! Even my 15 year-old sister liked it!"

Alma, 12

"This book is an absolute winner. I enjoyed reading it from cover to cover as its well written yet easy to read, colourful and full of interesting information."

Chrystabellie, 12

As well as expanding our current range of activities, we are working with partners in science communication to try and reach new and more diverse audiences. This includes developing the *New Age of Wonder* initiative announced in September 2015 by Lord Hall, the Director General of the BBC and the Society's Professor of Public Engagement, Professor Brian Cox FRS. *New Age of Wonder* is a partnership between the BBC and the wider scientific community to bring science to a broader audience through a series of campaigns commencing in 2017. The Society has played an important role in convening this project and will continue to do so 2016/17.

Brian Cox will also be leading the Society's work to promote the importance of experimental science. This will include the development of a series of films and activities focused on key experiments and how they translate into real world situations.

Involving the public in its policy work is an important aim of the public engagement strategy and progress on this has been slower than we would have liked. While some work has already begun, with examples shown in the policy section of this report (see page 52), we are planning to increase our public engagement activities alongside the planned growth of our policy work.

Digital communications are the principal means through which audiences around the world engage with our work. In 2015/16 we enjoyed significant growth across our digital channels:

- **Facebook** 125,000 followers, an increase of 76% (gaining on average 1,030 followers a week).
 - In February 2016 a Facebook post on gravitational waves was our first to reach over 100,000 people with 9,000 clicks, reactions and shares.
 - A test post of a short 'Robotic Hand' video became our most watched Facebook video to date, reaching over 33,000 people with over 9,000 video views.
- **Twitter** 116,000 followers, an increase of 28% (gaining on average 480 followers a week).
 - As part of the *Parents, Careers, Scientist* launch, our #AndAScientist campaign, reached over 1 million people with over 2.8 million impressions in its first week.
- **YouTube** over 4.2 million minutes of our content was watched, with over 600,000 individual video views.
- Our *Objectivity* videos in partnership with Brady Haran have had 1,348,616 views – over five million minutes of video content watched.

History of science programme

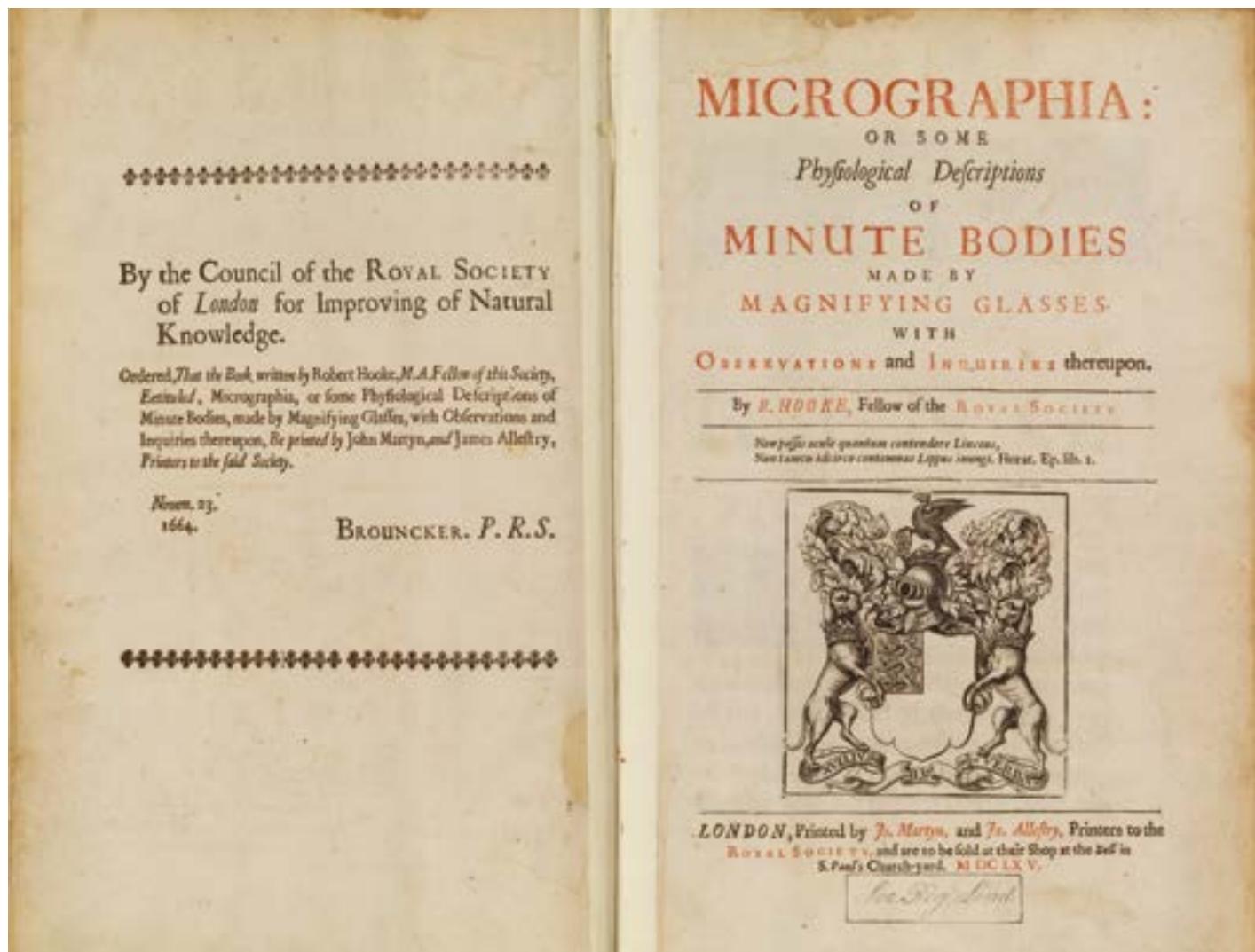
Our focus is to preserve, disseminate and develop the Royal Society's history of science collections, to further the academic study of history of science and to use the collections to excite audiences about science.

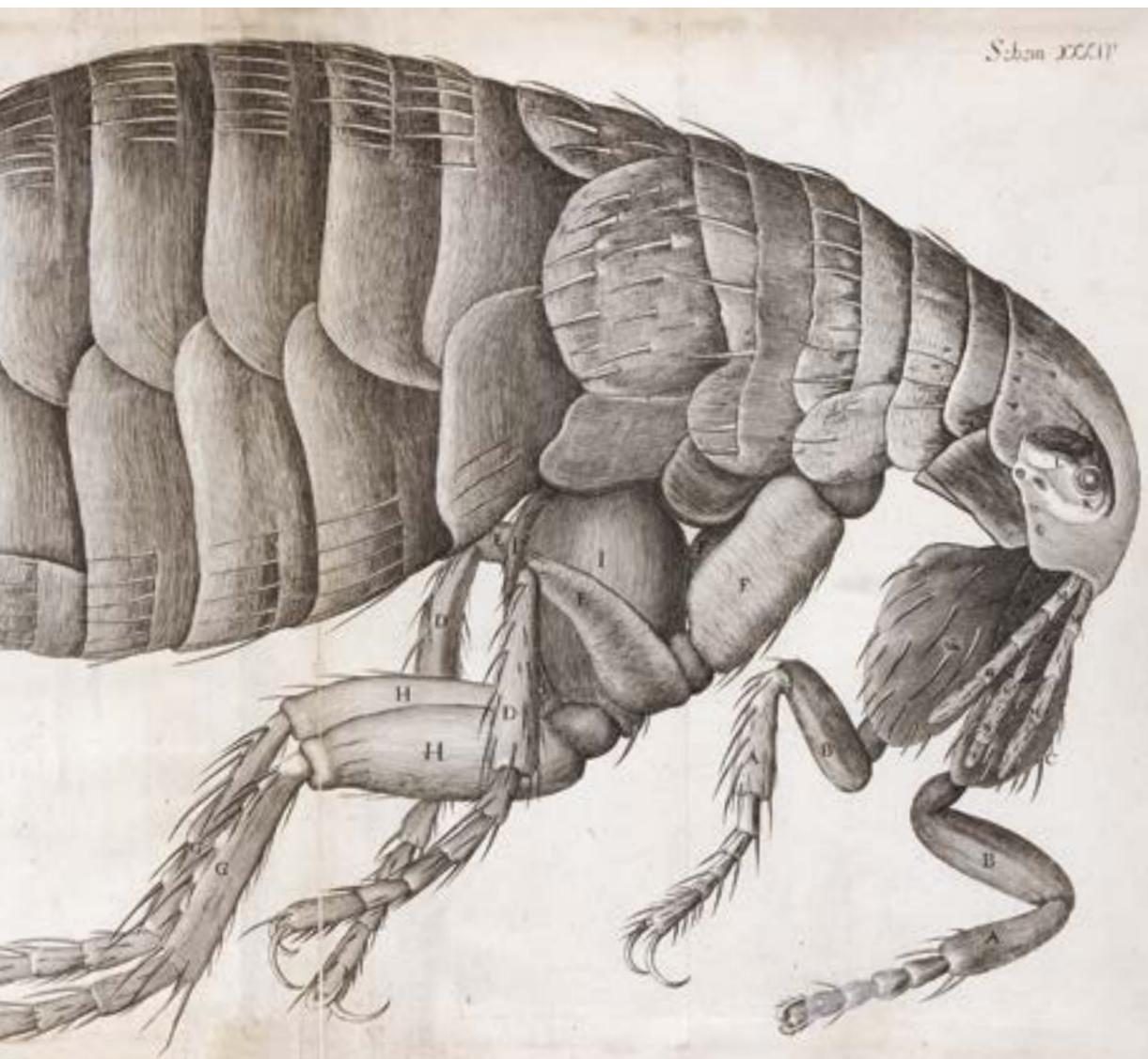
This year we have made exhibition loans to local, national and overseas museums including a unique partnership with the Science Museum and Science and Innovation Network South Korea. In November 2015 the National Science Museum of Korea opened the *10 Great Experiments and Science and Splendour* exhibition, showcasing nearly 200 artefacts and documents on display for the first time outside of the UK.

Below

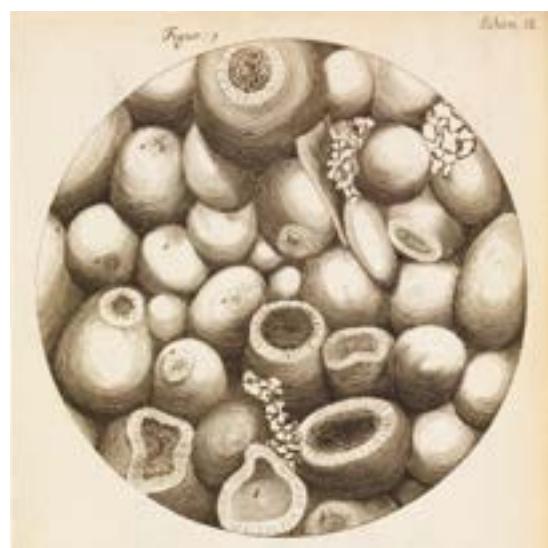
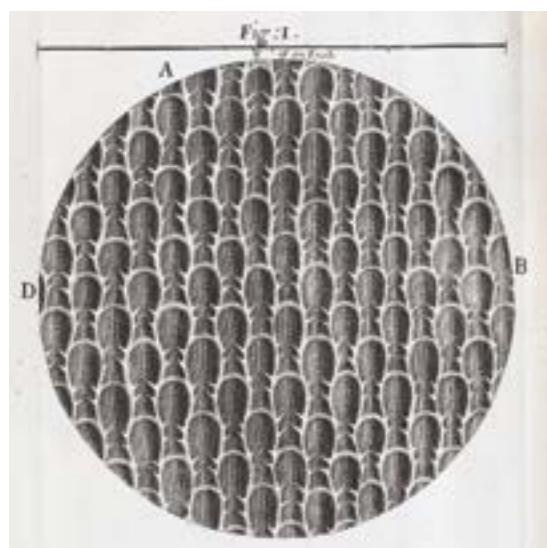
Imprimatur and title page of *Micrographia: or some physiological descriptions of minute bodies made by magnifying glasses with observations and inquiries thereupon*, by Robert Hooke (London, 1665).

In 2015 we celebrated the 350th anniversary of the publication of *Micrographia*. Written by Robert Hooke and published by the Royal Society in 1665, it was the first major book to examine the world of the very small and is credited with coining the term 'cell'. Hooke's sumptuously illustrated volume went on to become a scientific bestseller, capturing the imagination of a wide audience.





Hooke's sumptuously illustrated volume went on to become a scientific bestseller, capturing the imagination of a wide audience.



Top
Illustration of a flea from *Micrographia*, by Robert Hooke, 1665.

Far left
Illustration of the surface of a piece of seaweed from *Micrographia*, by Robert Hooke, 1665.

Left
Illustration of stone quarried in Kettering, Northamptonshire from *Micrographia*, by Robert Hooke, 1665.



Fundraising and development: support for the Royal Society

Left

Professor Jean-Jacques Muyembe-Tamfum, awarded the 2015 Pfizer Advanced Award for his seminal work on viral haemorrhagic fevers, including Ebola (see page 37).

Fundraising and development: support for the Royal Society

The Society is most grateful to all of those who support its work, whether through long-term commitments as friends of the Society or through relationships established more recently, and including donors who wish to remain anonymous.

Throughout its history, the Society's work has benefited from the generosity of philanthropists. During the year the Society was supported by trusts, foundations, companies, and individuals. The Society is most grateful to all of those who support its work, whether through long-term commitments as friends of the Society or through relationships established more recently, and including donors who wish to remain anonymous.

2015 marked the tenth anniversary of the formation of a partnership between Pfizer Inc and the Society. The purpose of the partnership was to promote scientific capacity strengthening in Africa, something of great importance for the economic development of the continent. The Royal Society Pfizer Award recognises research scientists based in Africa who are making innovative contributions to the biological sciences. Pfizer generously provided extended funding to mark the anniversary and two awards were presented in 2015 (see page 37 for information about this year's awards).

The Sino-British Fellowship Trust is one of the longest continuous supporters of the Society's work, contributing to high-quality international collaborations between the science communities in the UK and in China. The partnership between the Society and the Sino-British Fellowship Trust was established in 1986 when the Trust funded the first Royal Society Sino-British Fellowship Trust Incoming Fellowships. The Trust's gift continues to support Chinese scientists at early stages in their careers who wish to conduct research in the UK (see page 59).

In 2015/16 we continued to strengthen our international links and to forge new ones. Supporters of the Society in the United States provided further generous support, including via the American Friends of the Royal Society for activities in areas including climate change.

Right

The Raymond and Beverly Sackler USA-UK Scientific Forum took place in November 2015 on *Trends in Synthetic Biology and Gain of Function Research, and Regulatory Implications*. © iLexx.



The Raymond and Beverley Sackler USA-UK Scientific Forum was established in 2008 with the support of the Raymond and Beverley Sackler Foundation. This programme serves to sustain an enduring and productive partnership between the scientific leaderships of the UK and of the USA on pressing topics of worldwide scientific concern. These meetings are jointly organised by the Society and the US National Academy of Sciences and are alternately held in the UK and in the USA. In November 2015 the forum took place at the Kavli Royal Society International Centre at Chicheley Hall and was entitled *Trends in Synthetic Biology and Gain of Function Research, and Regulatory Implications*.

The Kan Tong Po Visiting Fellowship Programme enables scientists in the UK to undertake collaborations with scientists overseas. In 2015, three awards were made and linked scientists in the UK and scientists in Hong Kong (see page 59).

During the year Sir Ralph Kohn FRS provided further generous support to the Society, on this occasion towards the Royal Society Kohn International Fellowships, which encourage collaborations between scientists in the UK and in Israel.

During the year we received several valuable bequests from Fellows, Foreign Members, and others. The Society received additional amounts in respect of a bequest from physicist Michael Crowley-Milling. The generosity of the Crowley-Millings had led to the establishment a fund that promotes research in the physical sciences and their application, especially in the support of young scientists.

A bequest of £250,000 was received from Professor Jan Anderson FRS. Professor Anderson was an international expert in photosynthetic research, and held the post of Adjunct Professor at the Research School of Biological Sciences at the Australian National University. The Society also received a significant bequest from Dr Marjorie England a distinguished member of the University of Leicester Medical School.

During the year we received several valuable bequests from Fellows, Foreign Members, and others.

Thank you

The Society is truly grateful for the outstanding level of support from all our donors listed below and those who have chosen to remain anonymous over the last financial year.

President's Circle Members

The EPA Cephalosporin Research Fund
The Gatsby Charitable Foundation
The Kavli Foundation
Sir Ralph Kohn FRS
The Leverhulme Trust
Pfizer Inc
Rolls-Royce Group plc
Sino-British Fellowship Trust
Wellcome Trust
Winton Capital Management
K. C. Wong Education Foundation
The Wolfson Foundation
The Worshipful Company of Actuaries

Companies

Microsoft UK
IBM United Kingdom Trust

Trusts and Foundations

The Dana Foundation
The Grantham Foundation for the Protection of the Environment
The Royal Society of Chemistry's Pan Africa Chemistry Network
Society of Chemical Industry
The Lord Leonard and Lady Estelle Wolfson Foundation

Fellows and Foreign Members

Sir Geoffrey Allen FREng FRS
Professor Grigory Barenblatt ForMemRS
Sir Tom Blundell FMedSci FRS
Sir Walter Bodmer FMedSci FRS
Professor Harry Bryden FRS
Sir John Enderby CBE FRS
Sir James Gowans CBE FMedSci FRS
Professor Ian Grant FRS
Professor Antony Hewish FRS
Professor Veronica Van Heyningen CBE FMedSci FRS
Professor Bruce Joyce FRS
Professor Steven Ley CBE FMedSci FRS
Professor Robert Lloyd FRS
Sir Ravinder Maini FMedSci FRS
Professor Jeremiah Ostriker ForMemRS
Sir Martyn Poliakoff CBE FRS
Professor Susan Rees FRS
Professor Ian Smith FRS
Professor Robin Weiss FMedSci FRS
Dr Ian Young OBE FREng FRS

Individuals

Mrs Judith Gibson
Dr Malcolm Gray
Mr H James Hunt
Mrs Helen Paige
Mrs Brenda Osborne
Mrs Tracey Olsen
Mr Reinalt Vaughan-Williams
Lady Fiona Wilson

Legacies

The Society is grateful for the following bequests and for donations received in memory of others.

Professor Jan Anderson FRS
Dr Marjorie Ann England
Dr John Lund CBE FRS
Professor Norman Sheppard FRS



Financial review

Left

The Big Draw Festival is the world's biggest celebration of drawing. The Royal Society opened its doors for a day of art and science in October 2015.

Financial review

Income

In the year to 31 March 2016, the Royal Society's income increased from £75.1m to £77.7m, an increase of 3%. The majority of the Society's income comes from grants for charitable activities, which increased by 5% during the year to £58.1m (2015: £55.1m). Included in this is the Society's core grant from the Department for Business, Innovation & Skills (BIS) which was £47.1m (2015: £46.8m). In addition to this, the Society received income from BIS of £4.0m (2015: £2.3m) in support of the Newton Fund Academies' Programme which aims to develop science and innovation partnerships that promote the economic development and social welfare of partner countries.

Income from donations and legacies decreased in the year from £4.2m in 2014/15 to £3.6m in 2015/16. Gifts and donations fell by £3.6m on the prior year when a new endowment of £3.5m from the EP Abraham Cephalosporin Fund was recognised. The reduction in gifts and donations income was offset by increased income from legacies, which was £3.2m for the year (2015: £0.2m).

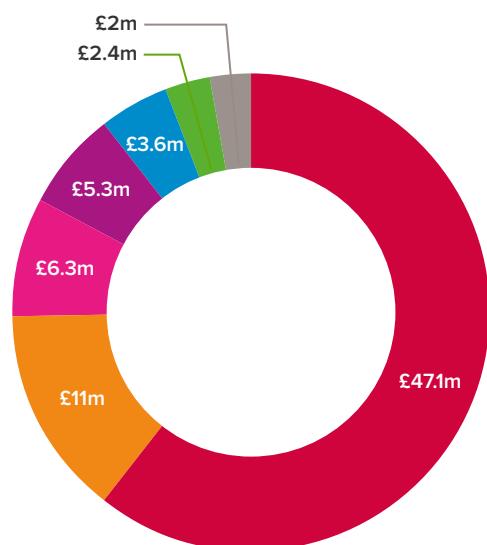
Trading in furtherance of charitable objectives income also fell by £0.3m during the year, from £9.3m in 2015 to £9.0m in 2016. This was due to a decline in conferencing income at Carlton House Terrace, caused by a reduction in the number of events sold and lower delegate rates. This has been attributed to economic uncertainty affecting our main customer groups caused by the government comprehensive spending review.

Income from investments increased by £0.6m in the year, from £4.7m in 2015 to £5.3m in 2016.

Expenditure

Total expenditure increased by £6.2m on the prior year, from £71.3m in 2015 to £77.5m in 2016, an increase of 9%. This was in line with the charity's objective of expanding its charitable programme. Expenditure on charitable activities increased from £67.7m to £73.4m, and remains around 95% of total expenditure. The majority of the Society's charitable expenditure is grant awards, which this year accounted for £53.5m (2015: £50.1m). This year the Society increased expenditure across many grant programmes, in particular the Newton Advanced Fellowships, Royal Society Research Professorships and DFID Africa awards.

Income

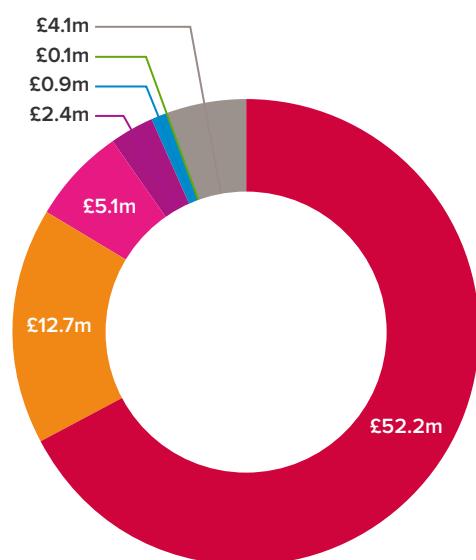


Total Income £77.7m

(2015: £75.1m)

- Core BIS grant
- Grant income
- Publishing income
- Investment income
- Donation income
- Conferencing income
- Trading and other income

Expenditure



Expenditure £77.5m

(2015: £71.3m)

- Supporting outstanding science
- Fostering international and global cooperation
- Education and public engagement
- Providing scientific advice for policy
- Promoting science and its benefits
- Recognising excellence in science
- Other

Grants

The grants made by the Society fall into two broad classes: (1) Fellowships and (2) research grants. They can be further classified into: (1) early-career Fellowships, Professorships and Senior Fellowships, and support for innovation and (2) research grants, collaboration and travel grants, capacity-building grants, and education-related grants. Grants applications are assessed by means of a peer-review process and consideration by a panel of experts comprising Fellows of the Royal Society and other senior scientists. Each panel is chaired by a Fellow of the Society.

Further information is available at royalsociety.org/grants/applications.

The primary purposes of the Society's grant-giving activities are to support the work of outstanding individual scientists at various stages of their careers, primarily in the UK, and to encourage collaborations between UK scientists and scientists throughout the world.

Chicheley Hall – Royal Society Trading Limited

The Society acquired Chicheley Hall in 2008 with the aim of operating the property as a centre for scientific and academic conferences. In addition to holding mission related activities, the Hall is available for conferences and other events, and Royal Society Trading Limited was established to process the activities of the Hall. Since February 2013, the management of the property has been outsourced to De Vere Venues, with the objective of breaking even after three years. The subsidiary fell short of achieving its objective of breaking even by 2016, and recorded a loss of £20,000 for the year. The Society will conduct a review of operations at Chicheley Hall in the coming year to determine a longer-term strategy for the property.

Pension and Life Assurance Plan of the Royal Society

The Society operates a defined benefit pension scheme which was closed to new members in 2014. The valuation of the scheme at 31 March 2016 showed a deficit of £8.6m (2015: £10.7m). This represents the difference between the assets and the obligations of the fund rather than an immediate cash liability. In accordance with FRS 102, the actuarial gains on the scheme of £1.7m (2015: losses of £6.2m) have been charged to unrestricted funds. A triennial valuation of the scheme will be undertaken in the current financial year, which will determine the long-term liability of the scheme for the coming years, but under the current valuation, the Society will make deficit contributions to the pension scheme of £0.7m during the next financial year. Current budget and forecasts indicate that the Society will be able to meet these contributions as they arise.

Investment Policy and Performance

On 23 March 2016, Council resolved to move to a total return investment strategy, and in line with this a new investment policy has been approved for 2016/17. Prior to this, and during the financial year 2015/16, the Society's investment policy was to hold assets to maximise overall return with an appropriate level of risk, when considered alongside the Society's Strategic Plan and its level of reserves.

The investment objectives during the year were to:

- provide long-term growth in the Society's endowment in excess of underlying inflation;
- provide a source of cash and liquidity to support the Society's operations to an appropriate sustainable level.

The value of the Society's investment portfolio reduced in the period, from £211.8m in 2015 to £200.1m in 2016 including unrealised losses of £11.2m (2015: unrealised gains of £13.1m). The fall in the value of investments is largely due to the relatively high weighting of equities in the portfolio, which were subject to difficult market conditions in the year. Despite the fall in investment values during the current year, over the longer term, the portfolio has met its objectives of providing long term real growth to the endowments, and has provided cash and liquidity. Income from investments was £5.3m (2015: £4.7m), an increase of 12% on the prior year.

Remuneration Policy

The aim of the Royal Society's remuneration policy is to maintain sustainable, fair levels of pay at the same time as attracting and retaining the right people to deliver our charitable objectives. In setting appropriate levels of senior management pay, the Society considers the skills, experience and competencies required for each role, and the remuneration level for those roles in sectors where suitable candidates would be found. Remuneration packages for all staff are benchmarked using proprietary pay surveys and external advisers.

In accordance with the Charities' Statement of Recommended Practice (SORP), the Royal Society discloses all payments to trustees (no trustees are remunerated) and the number of staff with a total remuneration of £60,000 and above.

Reserves

The total funds of the Society decreased by £8.9m to £256.4m, mostly due to decreases in endowment funds caused by falling investment values. Unrestricted funds also fell during the period from £84.2m to £83.8m, in line with the Society's plan to reduce reserves.

The Society holds free reserves so that it can respond to unforeseen charitable opportunities and continue to honour existing commitments in the event of a shortfall of income. The Society's policy is to review its income streams and expenditure commitments on an annual basis, assess the main financial risks faced by the Society and their associated likelihood in order to develop a risk-based reserves level.

Freely available reserves are calculated by taking total unrestricted funds and deducting unrestricted tangible fixed assets and the heritage assets. At the balance sheet date the value of the Society's free reserves was £18.6m (2015: £18.3m), which was above the target level of £11.0m. The Society continues to develop longer-term strategies to increase its charitable activities in a sustainable way which will reduce the reserves level.

Governance

The Royal Society was founded in 1660 and incorporated by Royal Charter. The Society was granted a Supplemental Charter in 2012 and that now serves as its governing document. The governing body of the Society is its Council, whose members are elected by and from the Fellowship. Under the Charter, Council 'shall and may have full authority, power, and faculty from time to time to draw up, constitute, ordain, make, and establish such laws, statutes, acts, ordinances, and constitutions as shall seem to them, or to the major part of them, to be good, wholesome, useful, honourable, and necessary, according to their sound discretions, for the better government, regulation, and direction of the Royal Society aforesaid, and of every Member of the same, and to do and perform all things belonging to the government, matters, goods, faculties, rents, lands, tenements, hereditaments, and affairs of the Royal Society aforesaid.' Council may have between 20 and 24 members, and there were 23 in the year. Council is chaired by the President of the Society, and among its members are four Officers: the Biological Secretary, the Foreign Secretary, the Physical Secretary, and the Treasurer. The President and the Officers serve five-year terms and the other members serve three-year terms.

The Society is a registered charity and Council is the trustee body under charity law. Fellows are not remunerated for serving as trustees. Council has complied with its duty to have due regard to the Charity Commission's public benefit guidance when exercising any powers or duties to which that guidance is relevant. Information about the public benefit provided by the Society is presented in this Report. Changes in the membership of Council took place as usual on 30 November (Anniversary Day). The new members attended an induction session at which a partner in a leading charity-law practice and the Internal Audit Engagement Partner gave presentations on trustee duties and internal control. During the year, Council also received a presentation on developments in the charity sector from a partner in another leading law firm and guidance from professional advisors on specific matters.

Council is supported by a range of committees, whose members include Fellows, other scientists, and other individuals with relevant expertise. Among the committees that report directly to Council are the following:

- Audit Committee, which advises Council on the adequacy and effectiveness of the Society's arrangements for governance, risk management, internal control, and value for money.
- The Board, whose remit encompasses fundraising and international affairs and consideration of urgent matters on behalf of Council.
- Diversity Committee, which advises Council on diversity strategy and oversees associated programmes.
- Education Committee, which advises Council on education-policy strategy and oversees associated programmes.
- Grants Committee, which advises Council on grants strategy and oversees associated programmes.
- Hooke Committee, which assesses proposals for scientific meetings to be held under the Society's auspices.
- Investment Committee, which advises Council on investment policy, determines investment strategy, and oversees implementation of the strategy and the performance of the Society's investment managers.
- Nominations Committee, which advises Council on candidates for election as members of Council and for appointment as chairs of committees and as members of Sectional Committees (see below).
- Planning and Resources Committee, which is concerned with planning and allocation and use of resources, including recommending budgets and monitoring performance against them and overseeing provision of services.
- Premier Awards Committee, which makes recommendations to Council on award of prizes by the Society.
- Public Engagement Committee, which advises Council on public engagement strategy and oversees associated programmes.
- Publishing Board, which is responsible for the policy and strategy of the Society's publishing programme, within scientific and financial objectives set by Council.
- Science, Industry, and Translation Committee, which advises Council on science and industry strategy and oversees associated programmes.
- Science Policy Advisory Group, which advises Council on the Society's work in science policy.
- Sectional Committees, of which there are ten spanning the scientific disciplines, which determine shortlists of candidates for election to the Fellowship and the Foreign Membership for consideration by Council.

As of 31 March 2016, the Society had 162 staff. Council delegates responsibility for day-to-day management of the Society to the Executive Director. The Society's staff are organised into sections concerned with programmes, services, and charitable trading operations.

Related parties and relationships with other organisations

The Royal Society had three wholly-owned trading subsidiaries during the year, Royal Society Enterprise Fund Limited 06480372, Royal Society Trading Limited 06967016 and Royal Society (London) Ltd 08808518.

Royal Society Enterprise Fund was dissolved on 1 March 2016 after management of the Enterprise Fund was taken over by Amadeus Capital, and Royal Society (London) Ltd, set up in 2013 to process certain trading activities that occur at Carlton House Terrace, is dormant.

The Society owns 100% of the £1 called-up and issued share capital of Royal Society Trading Limited which was set up to process the activities that occur at Chicheley Hall.

Royal Society (Australia) Pty Limited ACN 126112678 is the Trustee of the Royal Society Theo Murphy (Australia) Fund, an Australian company the shares of which are owned by the Society.

Details of related party transactions, including with Trustees, can be found in note 12 to the financial statements.

Details of the remuneration of key management personnel are disclosed in note 9 to the financial statements.

Details of the two pension schemes operated by the Royal Society are disclosed in note 25 to the financial statements.

Going concern

The Trustees consider that there are no material uncertainties about the Society and its subsidiaries to continue as a going concern.

Statement of Trustees' responsibilities

The Council members (who are the trustees of the Society) are responsible for preparing the trustees' annual report and the financial statements in accordance with applicable law and United Kingdom Accounting Standards (United Kingdom Generally Accepted Accounting Practice), including FRS 102 "The Financial Reporting Standard applicable in the UK and Republic of Ireland".

Charity law requires Council to prepare financial statements for each financial year that give a true and fair view of the state of affairs of the group and the parent charity and of the incoming resources and application of resources of the group for the year.

In preparing those financial statements the trustees are required to:

- select suitable accounting policies and then apply them consistently
- observe the methods and principles in the Charities SORP
- make judgements and accounting estimates that are reasonable and prudent
- state whether applicable accounting standards have been followed
- prepare the financial statements on the going concern basis unless it is inappropriate to presume that the charity will continue in business.

Council is responsible for keeping proper accounting records that disclose with reasonable accuracy at any time the financial position of the group and parent charity and enable them to ensure that the financial statements comply with the Charities Act 2011 and regulations made thereunder. Council is also responsible for safeguarding the assets of the group and the parent charity, and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

Council is responsible for the maintenance and integrity of the charity and financial information included on the charity's website. Legislation in the United Kingdom governing the preparation and dissemination of the financial statements and other information included in annual reports may differ from legislation in other jurisdictions.

Risk management

Council is responsible for ensuring that proper arrangements are in place for risk management. Council relies principally on Audit Committee, supported by the Internal Auditors PricewaterhouseCoopers LLP, to assess those arrangements and to advise it accordingly. Audit Committee considered regular reports on risk-management systems and management of major risks, and Council considered regular reports from Audit Committee and also reviewed management of major risks, including using its own risk register. The risk registers of the Society's sections were also updated periodically and used in monitoring management of risks and communicating information about risks across the organisation.

The Society's fundamental purpose is to promote, recognise, and support excellence in science and to encourage the development and use of science for the benefit of humanity. Its Strategic Plan and subsidiary strategies and implementation plans outline how it will do those things. The Society reflects frequently on continuing risks to achieving its purpose and the effectiveness of the various means it employs to mitigate them. It is also vigilant in identifying new risks and taking steps to address them. Actions and processes often contribute to mitigation of several risks simultaneously. The Society works assiduously to develop and maintain relationships in order to ensure that its activities remain relevant, that its contributions are effective, and that the value of its work is recognised. The main risks identified by Council and action taken to manage them are described below.

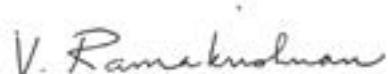
During the year the Department for Business, Innovation, and Skills confirmed that the Society's main grant for 2016/17 and the following three years would be the same in cash terms as in 2015/16, that the Newton Fund would be extended beyond its original five years, and that the Society would also receive support from the new Global Challenges Research Fund. The Society strengthened its arrangements for financial planning, adopted a new investment policy, further increased its fundraising activity, restructured its Conferencing business (one of its main sources of unrestricted income), and ran a major programme to inform consideration of the Society's future role in publishing (its other main source of unrestricted income but one in a business that is undergoing major transformation generally).

Further to the closure to new members of the Pension and Life Assurance Plan of the Royal Society in 2014/15, the Plan's trustees adopted a new investment strategy and the Society is identifying new independent expert employer-nominated trustees. The Kavli Royal Society International Centre at Chicheley Hall continues to be a successful venue for scientific events but also consumes considerable resources and a review of future options is being undertaken. The Society is considering the possibility of a new lease on its home at Carlton House Terrace. This is a complicated question and in this as in other matters Council is provided with professional advice of high quality. Council is also provided with training on governance generally and is kept up to date on developments in the charity sector.

The Society, like many organisations, depends on IT to be able to function and it has significantly strengthened its systems, infrastructure, and security. The Society continues to work closely with its external IT-services provider with the goal of ensuring that those services meet the Society's needs. Two major current projects are receiving careful attention: one to procure a new IT system to support administration of the Society's grant-giving programmes and the other to implement a new organisation-wide data strategy. The Society is completing a major review of its HR policies and procedures and implementing a series of improvements to HR processes and systems.

During the year the Society appointed a new Director of Science Policy and initiated a restructuring of the Science Policy Centre, one of the key parts of the organisation. The Society continued to expand its programmes and activities across a wide span, including in collaboration with many partners. Council was attentive to the associated additional demands on senior management and on those concerned with governance of the Society.

Work continues to ensure that the roles of Officers are properly defined and appropriate to the Society as it now is and to the evolving environment, and that there are adequate means for Officers to be held to account by Council and the Fellowship. Council considered whether Officers ought to be offered remuneration but having taking professional advice concluded that the status quo (no remuneration) should continue and that further consideration should be given to how the load on Officers could be shared among more Fellows. Council decided to establish working groups to examine questions concerning criteria for eligibility for election to the Fellowship, the election process, and the Society's role as the science academy of the Commonwealth, those being topics of recurrent interest to the Fellowship over many decades as the scientific landscape and the world of which it is a part have changed.



Venki Ramakrishnan

President of the Royal Society

Independent auditor's report to the Trustees of the Royal Society

We have audited the financial statements of The Royal Society of London for Improving Natural Knowledge, commonly known as the Royal Society, for the year ended 31 March 2016 which comprise the Consolidated Statement of Financial Activities, the Comparative Consolidated Statement of Financial Activities, the Consolidated and Charity Balance Sheets, the Consolidated Cash Flow Statement, the Accounting Policies and the related notes 1 to 28. The financial reporting framework that has been applied in their preparation is applicable law and United Kingdom Accounting Standards (United Kingdom Generally Accepted Accounting Practice) including FRS 102 "The Financial Reporting Standard applicable in the UK and Republic of Ireland.

This report is made solely to the charity's trustees, as a body, in accordance with section 144 of the Charities Act 2011 and regulations made under section 154 of that Act. Our audit work has been undertaken so that we might state to the charity's trustees those matters we are required to state to them in an auditor's report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the charity and the charity's trustees as a body, for our audit work, for this report, or for the opinions we have formed.

Respective responsibilities of trustees and auditor

As explained more fully in the Trustees' Responsibilities Statement, the trustees are responsible for the preparation of the financial statements which give a true and fair view.

We have been appointed as auditor under section 144 of the Charities Act 2011 and report in accordance with regulations made under section 154 of that Act. Our responsibility is to audit and express an opinion on the financial statements in accordance with applicable law and International Standards on Auditing (UK and Ireland). Those standards require us to comply with the Auditing Practices Board's Ethical Standards for Auditors.

Scope of the audit of the financial statements

An audit involves obtaining evidence about the amounts and disclosures in the financial statements sufficient to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or error. This includes an assessment of: whether the accounting policies are appropriate to the group's and the parent charity's circumstances and have been consistently applied and adequately disclosed; the reasonableness of significant accounting estimates made by the trustees; and the overall presentation of the financial statements. In addition, we read all the financial and non-financial information in the annual report to identify material inconsistencies with the audited financial statements and to identify any information that is apparently materially incorrect based on, or materially inconsistent with, the knowledge acquired by us in the course of performing the audit. If we become aware of any apparent material misstatements or inconsistencies we consider the implications for our report.

Opinion on financial statements

In our opinion the financial statements:

- give a true and fair view of the state of the group's and of the parent charity's affairs as at 31 March 2016, and of the group's incoming resources and application of resources, for the year then ended;
- have been properly prepared in accordance with United Kingdom Generally Accepted Accounting Practice; and
- have been prepared in accordance with the requirements of the Charities Act 2011.

**Opinion on other matter as required
by BIS grant letter**

In our opinion, in all material aspects, the core grant payments received from the Department for Business, Innovation and Skills (BIS) has been applied for the purposes set out in the Grant Letter and in accordance with the terms and conditions of the core grant.

**Matters on which we are required
to report by exception**

We have nothing to report in respect of the following matters where the Charities Act 2011 requires us to report to you if, in our opinion:

- the information given in the Trustees' Annual Report is inconsistent in any material respect with the financial statements; or
- sufficient accounting records have not been kept by the parent charity; or
- the parent charity financial statements are not in agreement with the accounting records and returns; or
- we have not received all the information and explanations we require for our audit.

**Deloitte LLP**

Chartered Accountants and Statutory Auditor
Reading

7 July 2016

Deloitte LLP is eligible to act as an auditor in terms of section 1212 of the Companies Act 2006 and consequently to act as the auditor of a registered charity.

Consolidated statement of financial activities

(Incorporating an income and expenditure account)

For the year ended 31 March 2016

	Notes	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2016 Total funds £'000	2015 Restated total funds £'000
Income and endowments from donations and legacies	1	3,290	54	–	240	3,584	4,238
Income from charitable activities							
Grants for charitable activities	4	992	57,089	–	–	58,081	55,111
Trading in furtherance of charitable activities	3	8,730	257	–	–	8,987	9,272
		9,722	57,346	–	–	67,068	64,383
Other trading activities	3	1,710	–	–	–	1,710	1,635
Income from investments	2	1,494	3,800	–	–	5,294	4,737
Other income	5	17	37	–	–	54	79
Total income		16,233	61,237	–	240	77,710	75,072
Expenditure on raising funds	6	3,463	317	77	264	4,121	3,604
Expenditure on charitable activities							
Promoting science and its benefits		433	473	–	–	906	758
Recognising excellence in science		120	6	–	–	126	124
Supporting outstanding science		7,203	45,030	–	–	52,233	50,611
Providing scientific advice for policy		1,304	1,070	–	–	2,374	2,435
Fostering international and global cooperation		978	11,685	–	–	12,663	9,740
Education and public engagement		3,086	2,013	–	–	5,099	4,069
Total expenditure		16,587	60,594	77	264	77,522	71,341

	Notes	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2016 Total funds £'000	2015 Restated total funds £'000
Net (expenditure)/ income before net (losses)/ gains on investments		(354)	643	(77)	(24)	188	3,731
Net (losses)/ gains on investments	18	(2,489)	(1,035)	(1,574)	(5,650)	(10,748)	13,678
Net (expenditure)/ income for the year		(2,843)	(392)	(1,651)	(5,674)	(10,560)	17,409
Gross transfers between funds	23	742	(742)	–	–	–	–
Gains on heritage assets revaluation	17	–	–	–	–	–	371
Actuarial gains/ (losses) on defined benefit pension scheme	25	1,700	–	–	–	1,700	(6,236)
Net movement in funds		(401)	(1,134)	(1,651)	(5,674)	(8,860)	11,544
Total funds brought forward		84,180	42,792	30,487	107,813	265,272	253,727
Total funds carried forward		83,779	41,658	28,836	102,139	256,412	265,271

All of the above results are derived from continuing activities. There are no other gains or losses other than those stated above.

The Charity's income for the year of £75,998,000 (2015: £73,437,000) less expenditure of £74,515,000 (2015: £69,196,000) led to a surplus of £1,485,000 (2015: £3,614,000). All income and expenditure and resulting net movements in funds are derived from continuing activities.

The notes that follow form part of the financial statements.

Comparative consolidated statement of financial activities

(Incorporating an income and expenditure account)

For the year ended 31 March 2015

	Notes	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2015 Restated total funds £'000
Income and endowments from donations and legacies	1	337	205	–	3,696	4,238
Income from charitable activities						
Grants for charitable activities	4	992	54,119	–	–	55,111
Trading in furtherance of charitable activities	3	8,942	330	–	–	9,272
		9,934	54,449	–	–	64,383
Other trading activities	3	1,635	–	–	–	1,635
Income from investments	2	1,317	3,420	–	–	4,737
Other income	5	3	76	–	–	79
Total income		13,226	58,150	–	3,696	75,072
Expenditure on raising funds	6	2,732	568	68	236	3,604
Expenditure on charitable activities						
Promoting science and its benefits		280	478	–	–	758
Recognising excellence in science		115	9	–	–	124
Supporting outstanding science		6,481	44,130	–	–	50,611
Providing scientific advice for policy		1,276	1,159	–	–	2,435
Fostering international and global cooperation		493	9,247	–	–	9,740
Education and public engagement		2,352	1,717	–	–	4,069
		10,997	56,740	–	–	67,737
Total expenditure		13,729	57,308	68	236	71,341
Net (expenditure)/ income before net (losses)/ gains on investments		(502)	842	(68)	3,460	3,731
Net (losses)/ gains on investments	18	3,010	2,595	1,888	6,185	13,678
Net (expenditure)/ income for the year		2,508	3,437	1,820	9,645	17,409
Gross transfers between funds	23	739	(739)	–	–	–
Gains on heritage assets revaluation	17	371	–	–	–	371
Actuarial gains/ (losses) on defined benefit pension scheme	25	(6,236)	–	–	–	(6,236)
Net movement in funds		(2,618)	2,698	1,820	9,645	11,544
Total funds brought forward		86,797	40,095	28,667	98,168	253,727
Total funds carried forward		84,179	42,793	30,487	107,813	265,271

This comparative statement of financial activities has been restated. See accounting policies for further information.

Consolidated balance sheet

As at 31 March 2016

Notes	Group 2016 £'000	Group 2015 £'000	Charity 2016 £'000	Charity 2015 £'000
Fixed assets				
Tangible assets	15	15,904	16,632	15,904
Heritage assets	17	49,277	49,206	49,277
Investments	18	200,099	211,858	200,099
	265,280	277,696	265,280	277,696
Current assets				
Stocks	21	42	44	21
Debtors receivable within one year	19	6,338	5,377	6,798
Debtors receivable after one year	19	1,000	1,750	1,000
Cash at bank and in hand	21	4,049	2,439	3,281
	11,429	9,610	11,100	8,951
Creditors: amounts falling due within one year	20	(11,633)	(11,293)	(10,821)
Net current (liabilities) / assets	(204)	(1,683)	279	(1,220)
Total assets less current liabilities	265,076	276,013	265,559	276,476
Creditors: amounts falling due after more than one year	20	(51)	(76)	(51)
Net assets before pension scheme liability	265,025	275,937	265,508	276,400
Defined benefit pension scheme liability	25	(8,613)	(10,665)	(8,613)
Total net assets	256,412	265,272	256,895	265,735
Permanent endowment funds	23	102,139	107,813	102,139
Expendable endowment funds	23	28,836	30,487	28,836
Restricted funds	23	41,658	42,792	41,658
				42,792
Unrestricted Funds				
Revaluation reserve	23	47,856	47,856	47,856
Defined benefit pension reserve	23	(8,613)	(10,665)	(8,613)
Unrestricted income funds	23	44,536	46,989	45,019
Total funds	256,412	265,272	256,895	265,735

The financial statements were approved and authorised for issue by Council and signed on its behalf by:

Professor Anthony Cheetham
Treasurer

on 7 July 2016

Consolidated statement of cash flows

For the year ended 31 March 2016

	Notes	2016 £'000	2016 £'000	2015 Restated £'000
Net cash (used in) / provided by operating activities	A		(3,073)	(2,247)

Cash flows from investing activities:

Investment income	2	5,294	4,737
Purchase of tangible fixed assets	15	(1,022)	(2,944)
Purchase of heritage assets	17	(56)	(27)
Purchase of investments	18	(19,681)	(24,804)
Proceeds from sale of investments	18	19,908	22,417
Net cash provided by / (used in) investment activities		4,443	(621)

Cash flows from financing activities:

Receipt of endowment	240		3,696
Net cash provided by / (used in) financing activities	240		3,696
Increase in cash and cash equivalents		1,610	828
Cash and cash equivalents at 1 April		2,439	1,611
Cash and cash equivalents at 31 March		4,049	2,439

A. Reconciliation of net (expenditure) / income to net cash flow from operating activities

	Notes	2016 £'000	2015 £'000
Net (expenditure) / income as per the statement of financial activities		(10,560)	17,410
<i>Adjustments for:</i>			
Depreciation charges	15	1,732	1,541
Losses / (gains) on investments	18	10,748	(13,678)
Investment income	2	(5,294)	(4,737)
Loss on the disposal of fixed assets	15	17	333
Investment management fees charged to portfolio	18	785	981
Decrease / (increase) in stocks		2	(2)
(Increase) / decrease in debtors		(211)	1,411
Increase in creditors		315	896
Donated heritage assets	17	(15)	(27)
Increase in endowment investments		(240)	(3,696)
Difference between pension charge and cash contributions	26	(352)	(2,679)
Net cash (used in) / provided by operating activities		(3,073)	(2,247)

Accounting policies

For the year ended 31 March 2016

The principal accounting policies adopted in the preparation of these financial statements are as follows:

Accounting convention

The financial statements have been prepared in accordance with the Statement of Recommended Practice: Accounting and Reporting by Charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) issued on 16 July 2014 and the Financial Reporting Standard applicable in the United Kingdom and Republic of Ireland (FRS 102) and the Charities Act 2011 and UK Generally Accepted Practice as it applies from 1 January 2015, and the Companies Act 2006.

The financial statements have been prepared to give a true and fair view and have departed from the Charities (Accounts and Reports) Regulations 2008 only to the extent required to provide a true and fair view. This departure has involved following Accounting and Reporting by Charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) issued on 16 July 2014 rather than the Accounting and Reporting by Charities: Statement of Recommended Practice effective from 1 April 2005 which has since been withdrawn.

Assets and liabilities are initially recognised at historical cost or transaction value unless otherwise stated in the relevant accounting policy or note.

These financial statements consolidate the results of the Royal Society and its active wholly-owned subsidiary, Royal Society Trading Limited on a line by line basis. Transactions and balances between the charity and its subsidiary have been eliminated from the consolidated financial statements. Balances between the entities are disclosed in the notes of the Society's balance sheet. A separate statement of financial activities for the charity itself is not presented.

The charity meets the definition of a qualifying entity under FRS 102 and has therefore taken advantage of the disclosure exemption in relation to presentation of a cash flow statement in respect of its separate financial statements, which are presented alongside the consolidated financial statements.

The Royal Society is a Public Benefit Entity under FRS 102.

Reconciliation with previous Generally Accepted Accounting Practice (GAAP)

In preparing the accounts the Trustees have considered whether in applying the accounting policies required by FRS 102 a restatement of comparative items was required. The transition date was 1 April 2015 and adjustments on transition relate to the following items:

- Governance costs are now allocated to activities on the same basis as support costs. This has no impact on the funds position or net income and expenditure previously reported.
- The comparatives for pensions in note 26 have been restated in line with FRS 102 in order to provide appropriate comparatives to the current year disclosures. However, the accounting entries in the statement of financial activities have not been restated on the basis of materiality (and there is no overall impact on the balance sheet valuation of the liability).

On the basis of materiality, there has been no other prior period adjustment of comparative items relating to any other requirements of FRS 102.

Critical accounting judgements and key sources of estimation uncertainty

In the application of the group's accounting policies the trustees are required to make judgements, estimates and assumptions about the carrying amounts of assets and liabilities that are not readily apparent from other sources. The estimates and associated assumptions are based on historical experience and other factors that are considered to be relevant. Actual results may differ from these estimates.

The estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised in the period in which the estimate is revised if the revision affects only that period, or in the period of the revision and future periods if the revision affects both current and future periods.

Critical judgements and sources of estimation uncertainty include income recognition, cost allocation, depreciation, provisions and actuarial assumptions relating to the defined benefit pension scheme.

Fund accounting

Unrestricted funds comprise accumulated surpluses and deficits on general funds that are available for use at the discretion of the trustees in furtherance of the general objectives of the charity.

Restricted and endowment funds are subject to specific restrictions imposed by the donor.

Transfers between funds may arise when there is a charge from unrestricted funds to other funds or there is a release of restricted funds to unrestricted funds.

Income

Donated goods and services are included at the value to the Society where these can be quantified. No amounts are included in these financial statements for the services donated by volunteers or Fellows.

Income from trading in subsidiary undertakings is transferred to the Society by gift aiding the profits of those undertakings.

Donations are accounted for as soon as their amount and receipt is certain. Donations include Gift Aid based on amounts recoverable at the accounting date.

Legacy income is recognised on a receivable basis when there is sufficient evidence to provide necessary probability that it will be received and the value of the incoming resources can be measured with sufficient reliability.

Fellows' Annual Contributions are recognised in the year in which they become due. Fellows' Annual Contributions may be compounded into a single payment which is fully recognised in the year it is paid.

Investment income and interest on deposits is recognised on an accruals basis. Investment income arising on endowment funds is credited to the appropriate fund in accordance with the prescribed conditions.

Grants are credited as income in the year in which they are receivable. Grants are recognised as receivable when all conditions for receipt have been complied with. Where donor-imposed restrictions apply to the timing of the related expenditure as a precondition of its use the grant is treated as deferred income until those restrictions are met. Grants received for specific purposes are accounted for as restricted funds. Grants receivable in respect of expenditure on tangible fixed assets are treated as income of a restricted fund.

Expenditure

Expenditure, including irrecoverable VAT, is accounted for on an accruals basis. Expenditure is allocated to the particular activity where the cost relates directly to that activity. However, the cost of the overall direction and administration of the charity, comprising salary and overhead costs, is apportioned, based on the costs of staff engaged in direct activities.

Charitable expenditure includes all expenditure incurred on grants awarded and on other schemes run in pursuance of the Society's objectives under its Charter, including Fellowship activities and primary purpose trading. The Society adopted a five year strategy in 2012 and the charitable activities of the Society have been reported under the six main strategic objectives.

Costs of raising funds include those costs incurred in raising donations and legacies.

The direct costs of supporting these activities, including staff and other overhead costs, are separately analysed and shown as support costs under this heading.

Governance costs are incurred in relation to the running of the Society. These include the costs of strategic planning and attending to the Society's statutory affairs. Support services and governance costs are allocated on a pro-rata basis using departmental salary costs as a base.

Grants are recognised as a liability when the Society is under a legal or constructive obligation to make a transfer to a third party. As the Society retains the discretion to terminate grants only the grant expenditure in the current financial year is recognised in the financial statements. Grant commitments in future periods are treated as liabilities of those periods and not as liabilities at the balance sheet date. Such grants are disclosed as future commitments.

Foreign currency

Transactions in foreign currencies are translated into sterling using a weekly rate of exchange ruling at the date of the transaction. Assets and liabilities in foreign currency are translated into sterling at the rate of exchange ruling on the balance sheet date.

Leased assets

All operating leases and rental expenses are charged to the statement of financial activities as incurred over the term of the lease on a straight line basis.

Tangible fixed assets

Expenditure on tangible fixed assets is capitalised if the cost of the total asset exceeds £5,000. Additions of smaller value may be capitalised if forming part of a larger asset. The cost of other items is written off as incurred.

Depreciation is calculated on all assets, excluding freehold land and assets under development, to write off the cost of tangible fixed assets on a straight-line basis over their expected useful lives as follows:

Freehold property and improvements	20 – 50 years
Freehold fixtures and fittings	3 – 10 years
Leasehold improvements	20 – 30 years
Leasehold fixtures and fittings	3 – 10 years
Computers and AV equipment	3 – 5 years
Other equipment	10 – 20 years

Fixed assets are subject to review for impairment when there is an indication of a reduction in their carrying value. Any impairment is recognised in the statement of financial activities in the year in which it occurs.

Heritage assets

Heritage assets comprise:

- Printed books
- Archives
- Pictures
- Sculptures and other works of art
- Other artefacts

Printed books and archives are included on the balance sheet at cost using a valuation performed in 2003 as a proxy for cost. Pictures, sculptures and other works of art, and other artefacts are included on the balance sheet on a valuation basis. The valuation reflects the fair market / replacement value and is performed every five years.

Impairment reviews are carried out at the end of each reporting period to ensure that the carrying value of the heritage assets reflect their carrying amounts.

Additions to heritage assets are made by purchase or donation. Purchases are initially recorded at cost and donations are recorded at a current value where available. The cost of obtaining an annual value outweighs the value of any resultant benefit. The Society holds and retains these assets as a long-term policy for use in its charitable purposes and has no intention of disposing of any of these items.

The trustees do not consider that reliable cost or valuation information can be obtained for a large part of the archives collection and the Society does not therefore recognise these assets on its balance sheet. The Society was founded in 1660 and the collection has been built up throughout its existence. Reliable and relevant information on the cost of many of the assets is therefore not readily available. The number of un-capitalised assets held in the collection is extensive and their nature diverse; accordingly efforts to obtain costs or values would be prohibitively expensive compared with any benefits arising from the exercise. Added to this, there is a lack of comparable market values. Therefore any value attributed to these assets would be purely speculative and of limited practical use.

Investments

Investments listed on a recognised stock exchange, including Investment and Unit Trusts, are stated at mid-market value at the balance sheet date.

Net investment gains/ losses for the year are credited/ charged in the statement of financial activities. Unlisted investments comprise directly held investments and Private Equity and Venture Capital funds managed by third party investment fund managers. These investments are held at fair value (market value) in accordance with the International Private Equity and Venture Capital Valuation Guidelines. Where a reliable estimate of fair value is not available investments are held at cost. Investments held at cost are reviewed annually for impairment. No adjustment for impairment of the value of unlisted investments was considered necessary in the year.

Investment management fees are charged proportionally against the funds under investment. The investments in subsidiary undertakings are held at cost on the Society's balance sheet.

Financial instruments

Financial assets and financial liabilities are recognised when the company becomes a party to the contractual provisions of the instrument. All financial assets and liabilities are initially measured at transaction price (including transaction costs). With the exception of fixed asset investments, basic financial instruments are initially recognised at transaction value and subsequently measured at their settlement value.

Trade and other debtors are recognised at the settlement amount due after any discount offered and net of the bad debt provision. Prepayments are valued at the amount prepaid net of any trade discounts due. Creditors and provisions are recognised where the company has a present obligation resulting from a past event that will probably result in the transfer of funds to a third party and the amount due to settle the obligation can be measured or estimated reliably. Creditors and provisions are normally recognised at their settlement amount after allowing for any trade discounts due.

Pension costs

The Society contributes to three pension schemes on behalf of its employees: the Pension and Life Assurance Plan of the Royal Society, a defined benefit scheme; the Universities Superannuation Scheme (USS), a defined benefit scheme; and the Royal Society Group Personal Pension Plan, a defined contribution scheme.

The assets of the Pension and Life Assurance Plan of the Royal Society scheme are held separately from those of the Society in separate trustee-administered funds. Pension Scheme assets are measured at fair value and liabilities on an actuarial basis using the projected unit method and discounted at a rate equivalent to the current rate of return on a high-quality corporate bond of equivalent currency and term to the Scheme liabilities. The actuarial valuations are obtained triennially and updated under FRS 102 rules at each balance sheet date. Any surplus or deficit is shown in the balance sheet as an asset or liability.

The charge to the statement of financial activities is calculated so as to spread the cost of pensions over employees' working lives with the Society. The charge comprises the administration costs of running the scheme, the current service cost computed by the actuary under FRS 102 and gains and losses on settlements and curtailments. Past service costs/ credits are recognised immediately if the benefits have vested. If the benefits have not vested immediately, the costs are recognised over the period until vesting occurs. The interest on the assets and liabilities for the period are shown as a net amount of other finance costs or credits charged or credited to the statement of financial activities. Actuarial gains and losses are recognised immediately under the description 'Actuarial losses on defined benefits pension scheme'.

USS is a multi-employer scheme and it is not possible to identify the Society's share of the underlying assets and liabilities. As required by FRS 102, the contributions are charged directly to the income and expenditure account as if it was a defined contribution scheme. In addition, for the first time, a provision for a liability under the deficit recovery plan for the USS multi-employer pension scheme has been charged to the income and expenditure account in 2016. This provision has been calculated using the modeller developed by the British Universities Finance Directors Group (BUFDG), with the support of the USS trustee company, to provide a tool for estimating the liability under the recovery plan for accounting purposes. No transition adjustment to the comparative has been made on the basis of materiality.

USS is a 'last man standing' scheme which means that in the event that another member institution becomes insolvent the other participating members will pick up any funding shortfall. Further details about USS information about the latest informal valuations of the scheme and proposed rule changes can be found at uss.co.uk

The defined contribution scheme came into existence on 1 October 2013 and is open to all employees. The pension charge in relation to this scheme is based upon employer's contributions payable in the year.

Taxation

The Society is a registered charity and as such is entitled to certain tax exemptions on income and profit from investments and surpluses on any trading activities carried out in furtherance of the charity's primary objectives. These profits are applied solely for charitable purposes.

Notes to the financial statements

For the year ended 31 March 2016

1. Income from donations and legacies					
	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2016 Total funds £'000
					2015 Total funds £'000
Gifts and donations	184	21	—	—	205
Legacies	2,883	33	—	240	3,156
Fellows' contributions	223	—	—	—	223
Total	3,290	54	—	240	3,584
					4,238

2. Income from investments					
	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2016 Total funds £'000
					2015 Total funds £'000
Dividends – UK equities	992	2,555	—	—	3,547
Dividends – Overseas equities	400	1,030	—	—	1,430
Interest – UK fixed interest securities	38	97	—	—	135
Interest – Overseas fixed interest securities	41	105	—	—	146
Bank deposit interest	23	13	—	—	36
Total	1,494	3,800	—	—	5,294
					4,737

3. Trading					
	External income £'000	Recharged internal lettings £'000	Gross expenditure £'000	2016 net surplus/(deficit) £'000	2015 net surplus/(deficit) £'000
Other trading activities					
Lettings through subsidiary – Kavli Royal Society International Centre	1,710	452	(2,182)	(20)	(55)

Trading in furtherance of charitable activities					
	External income £'000	Recharged internal lettings £'000	Gross expenditure £'000	2016 net surplus/(deficit) £'000	2015 net surplus/(deficit) £'000
Publishing	6,259	—	(2,624)	3,635	3,502
Lettings in furtherance of objectives – Carlton House Terrace	2,443	1,140	(2,479)	1,104	1,427
Other	285	—	—	285	357
	8,987	1,140	(5,103)	5,024	5,286
Total	10,697	1,592	(7,285)	5,004	5,231

The costs of the Society's publishing operation and the costs associated with the lettings in furtherance of charitable objects are included in 'Supporting outstanding science' on the face of the statement of financial activities. The costs of lettings through the subsidiary are included in expenditure on raising funds.

The Society was exempt from income tax, corporation tax and capital gains tax on income derived from its primary purpose trading and charitable activities.

4. Grants for charitable activities

	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2016 Total funds £'000	2015 Total funds £'000
From Government and other public bodies						
Grant from the Department for Business, Innovation and Skills	992	46,109	–	–	47,101	46,801
Other grants from government and public bodies	–	6,016	–	–	6,016	4,136
From other external bodies						
Contribution to charitable activities	–	4,964	–	–	4,964	4,174
Total	992	57,089	–	–	58,081	55,111

Details of the income to and movement of individual funds are disclosed in note 23.

5. Other income

	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2016 Total funds £'000	2015 Total funds £'000
Other Income	17	37	–	–	54	79
Total	17	37	–	–	54	79

6. Expenditure on raising funds

	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2016 Total funds £'000	2015 Total funds £'000
Expenditure on raising funds	1,154	–	–	–	1,154	482
Cost of trading	2,182	–	–	–	2,182	2,141
Investment management fees	127	317	77	264	785	981
Total	3,463	317	77	264	4,121	3,604

7. Expenditure on charitable activities					
	Staff costs £'000	Grant costs £'000 (Note 10)	Other direct costs £'000	Support costs £'000 (Note 8)	2016 Total £'000
					2015 Restated total £'000
Charitable activities					
Promoting science and its benefits	140	200	351	215	906
Recognising excellence in science	—	—	126	—	126
Supporting outstanding science	2,379	42,643	3,562	3,649	52,233
Providing scientific advice for policy	849	—	221	1,304	2,374
Fostering international and global cooperation	615	10,287	818	943	12,663
Education and public engagement	1,333	329	1,392	2,045	5,099
Total costs of charitable activities	5,316	53,459	6,470	8,156	73,401
					67,737

8. Support costs					
	Media relations and public engagement £'000	Facilities and building management £'000	Support services £'000	Governance costs £'000	2016 Total £'000
					2015 Restated total £'000
Expenditure on raising funds	25	147	426	40	638
Charitable activities					
Promoting science and its benefits	8	49	144	14	215
Recognising excellence in science	—	—	—	—	—
Supporting outstanding science	142	839	2,439	229	3,649
Providing scientific advice for policy	51	300	871	82	1,304
Fostering international and global cooperation	37	217	630	59	943
Education and public engagement	80	470	1,367	128	2,045
Total support costs	343	2,022	5,877	552	8,794
					6,662

Facilities and building management comprises the rent and running costs (depreciation, insurance, cleaning and security) of 6 – 9 Carlton House Terrace.

Support services comprises finance, IT, HR, pension costs and corporate management.

Support services and governance costs are allocated on a pro-rata basis using departmental salary costs as a base.

9. Staff costs

	2016 £'000	2015 £'000
Costs by type		
Salaries	7,347	6,685
Social Security costs	667	606
Pension costs	(78)	(1,978)
Total	7,936	5,313

As required by FRS 102, included in 2016 staff costs is an amount of £76,236 relating to holiday pay owed to staff at 31 March 2016. Also required by FRS 102 and included within staff costs 2016 is an amount of £186,125 relating to the costs of the provision arising as a result of the deficit recovery plan for the Universities Superannuation Scheme (USS) multi-employer pension scheme (note 25). No transition adjustment to the comparative has been made for either requirement on the basis of materiality.

Pension costs include employer contributions to two Royal Society pension schemes, a defined contribution scheme and a defined benefit scheme, and the USS pension scheme as follows:

- The Royal Society Group Personal Pension Plan (defined contribution): £184,000 (2015: £140,000)
- The Pension and Life Assurance Plan of the Royal Society (defined benefit): £374,000 (2015: £509,000)
- USS: £79,000 (2015: £70,000)

These costs are net of a service credit arising as a result of the changes to Plan benefits during the previous financial year. Detailed information is provided in note 25.

The following numbers of employees of the Royal Society earning £60,000 per annum or more received total emoluments within the bands shown:

	2016	2015
£60,001 – £70,000	2	6
£70,001 – £80,000	7	2
£90,001 – £100,000	2	4
£100,001 – £110,000	3	–
£110,001 – £120,000	2	1
£130,001 – £140,000	1	–
£140,001 – £150,000	–	1
£160,001 – £170,000	1	–
£200,001 – £210,000	–	1
£230,001 – £240,000	–	1
£280,001 – £290,000	1	–

Of the above 19 employees earning £60,000 per annum or more, 13 are key management personnel (2015: 13), with total remuneration of £1,577,141 (2015: £1,515,273).

9. Staff costs (continued)**Average number of employees, analysed by function:**

	2016	2015
Expenditure on raising funds	7	4
Expenditure on charitable activities	113	102
Support (including governance)	43	45
Total	163	151

The average full time equivalent was 162 (2015: 150).

Redundancy and termination payments were made to 6 employees during the year (2015: 3).

Total redundancy and termination payments in respect of these employees were £402,507 (2015: £109,160).

10. Grants		Grants to institutions £'000	Grants to individuals £'000	2016 Total £'000	2015 Total £'000
Fellowships					
University Research Fellowships	—	25,477	25,477	27,004	
Dorothy Hodgkin Fellowships	—	2,339	2,339	2,481	
Newton Advanced Fellowships	—	3,052	3,052	1,558	
Newton International Fellowships	—	2,522	2,522	2,228	
Professorship of Public Engagement	—	36	36	21	
Wolfson Research Merit Award	3,199	—	3,199	3,307	
Leverhulme Trust Senior Research Fellowships	—	307	307	298	
Royal Society Research Professorships	—	6,346	6,346	2,405	
Industry Fellowships	—	1,530	1,530	1,756	
International Fellowship Grants	—	188	188	192	
Sir Henry Dale Fellowships	—	2,200	2,200	1,680	
Education schemes					
Education Research Fellowships	—	30	30	135	
Partnership Grants scheme	90	—	90	55	
Other Education grants	—	121	121	67	
Other grant programmes					
Australian Academy of Science Think Tank	—	159	159	—	
Brian Mercer Awards	—	200	200	319	
Commonwealth Science	—	51	51	188	
Paul Instrument Fund	—	112	112	247	
Research Grants	—	—	—	2,187	
Awards and Prizes	—	202	202	251	
Leverhulme Royal Society Africa Awards	—	652	652	919	
The Royal Society Mullard Award	—	—	—	2	
Newton International Exchanges	—	640	640	500	
India-UK Scientific Seminars	—	(18)	(18)	79	
International Exchanges	—	1,501	1,501	1,314	
DFID Africa Awards	—	1,433	1,433	444	
Athena SWAN Charter Award	20	—	20	25	
DAIWA joint projects	—	29	29	66	
Royal Society Africa Exchanges	—	33	33	—	
Foundation for Science and Technology	36	—	36	—	
International Council for Scientific Unions	25	—	25	36	
South Africa Seminars	—	(6)	(6)	68	
Kavli Scientific Seminars	—	91	91	—	
Wolfson Laboratory Refurbishment Grants	862	—	862	279	
Total	4,232	49,227	53,459	50,111	

10. Grants (continued)

	Number of grants awarded	2016 Total £'000	2015 Total £'000
Recipients of institutional grants			
University College London	23	429	227
University of Cambridge	16	377	170
Imperial College London	18	244	242
University of Oxford	17	215	319
University of Warwick	18	196	154
University of Southampton	17	179	147
Institute of Cancer Research	4	179	–
University of Bristol	16	175	164
University of Nottingham	11	163	60
University of Glasgow	14	131	175
University of Edinburgh	11	124	112
University of Leeds	12	118	105
University of St Andrews	11	115	96
University of York	8	111	94
University of Exeter	9	96	84
University of Manchester	12	92	80
King's College London	4	90	55
University of Bath	6	87	76
University of Birmingham	8	84	–
University of Leicester	7	75	108
University of Surrey	5	61	63
University of Durham	5	51	–
Swansea University	–	–	53
Aston University	–	–	26
University of Strathclyde	–	–	51
Other organisations	145	840	1,041
Total	397	4,232	3,702

Grants are generally awarded to particular individuals, although the actual award is made to the host organisation.

Details of individual grants awarded during the year analysed by organisation are available from the Royal Society Finance Department on request.

11. Reconciliation of grants payable

	2016 Total £'000	2015 Total £'000
Liability at 1 April	1,323	1,278
New grants awarded in year	54,858	51,743
Grants paid in year	(53,310)	(50,060)
Grants refunded to the Society	(1,398)	(1,638)
Liability at 31 March	1,473	1,323

All grants payable fall due within one year.

12. Payments to Trustees and related party transactions

	2016 Total £'000	2015 Total £'000
Remuneration	—	—
Expenses: travel and subsistence	103	111

Expenses were reimbursed to or paid on behalf of 24 Trustees (2015: 25 Trustees).

Indemnity insurance

With the consent of the Charity Commission, the Society has taken out Trustees' indemnity insurance. The cost of this insurance for the year was £2,500 (2015: £2,500). No claims have been made under this policy.

Grants and awards

Professor Michael Cates FRSE FRS is a holder of a Royal Society Research Professorship. The award was transferred from University of Edinburgh to the University of Cambridge in July 2015. The amount paid in respect of the award in the 2015/16 financial year to the University of Edinburgh was £41,000 (2015: £166,000) and to the University of Cambridge was £118,000 (2015: £nil).

Dame Wendy Hall DBE FREng FRS is currently a co-applicant on a Newton Advanced Fellowship awarded to Dr Jie Tang in the previous year and ongoing to 2018. Total value of award is £111,000. This was awarded and taken up before the 2015/16 financial year. The amount paid to the University of Southampton in 2015/16 was £37,000 (2014/15: £37,000).

Professor Carlos Frenk FRS is currently a co-applicant on a Newton Advanced Fellowship awarded to Dr Liang Gao. The total value of award is £111,000. This was awarded and taken up before the 2015/16 financial year. The amount paid to Durham University in 2015/16 was £37,000 (2014/15: £37,000).

Professor John Wood FMedSci FRS was a holder of a Wolfson Research Merit Award in 2015. The amount paid to the University College London in respect of the award for 2015 was £25,000 (2014: £25,000).

Other

Sir Venki Ramakrishnan, President of the Royal Society, has use of the President's flat at Carlton House Terrace. In 2015, Sir Paul Nurse, former President of the Royal Society, had use of the flat.

Related party transactions

Dr Hermann Hauser KBE FREng FRS is a partner of Amadeus Capital Partners Limited. The Society has entered into a Limited Partnership Agreement with Amadeus to manage and administer the Enterprise Fund, a restricted fund of the Society which invests in early-stage science-based companies. Amadeus Capital Partners Limited received £199,938 in 2015/16 in relation to the operation of the fund (2014/15: £355,000 for set up and operation).

13. Total resources expended include the following amounts:

	2016 Total £'000	2015 Total £'000
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Operating lease rentals

Plant and machinery	26	46
Rent	490	490
Total	516	536

Fees payable to the Charity's auditors for:

The audit of the Charity and Group accounts	32	30
The audit of the Charity's subsidiaries accounts pursuant to legislation	5	4
The audit of the Charity's pension scheme	7	8
Grant audits	3	7
(Over) / under provisions for the prior year fees	(4)	(12)
Total audit fees	43	37

Charges on owned assets

Depreciation	1,732	1,350
Impairment – Revaluation of Chicheley Hall	–	191
Total	1,732	1,541

Trustees' expenses

Trustee travel and other expenses	103	111
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14. Financial memoranda**Income and expenditure relating to government grants during the year was as follows:**

	2016 Total £'000	2015 Total £'000
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Department for Business, Innovation and Skills Grant

Income	47,101	46,801
Expenditure	(47,101)	(46,801)
Total	–	–

Department for International Development Grant

Income	1,757	733
Expenditure	(1,757)	(733)
Total	–	–

15. Tangible fixed assets – Group and Charity

	Chicheley Hall freehold and property improvement £'000	Chicheley Hall computers and other equipment £'000	Leasehold improvements £'000	Computers and other equipment £'000	Assets under development £'000	2016 £'000	2015 £'000
Cost							
At 1 April	17,488	681	18,667	4,234	1,306	42,376	39,766
Additions	62	14	521	82	343	1,022	2,944
Disposals	–	(6)	(19)	(2,037)	–	(2,062)	(333)
Transfers	–	–	461	745	(1,206)	–	–
At 31 March 2016	17,550	689	19,630	3,024	443	41,336	42,377
Depreciation							
At 1 April	13,907	415	7,474	3,949	–	25,745	24,204
Charge for year	65	65	1,273	329	–	1,732	1,350
Revaluation	–	–	–	–	–	–	191
Disposals	–	(6)	(19)	(2,020)	–	(2,045)	–
At 31 March 2016	13,972	474	8,728	2,258	–	25,432	25,745
Net book value at 31 March 2016	3,578	215	10,902	766	443	15,904	16,632
Net book value at 31 March 2015	3,581	266	11,193	285	1,307	16,632	

All tangible fixed assets are used for the support of charitable activities within the Society.

The Group and the Charity have freehold property with a net book value of £3,578,000 (2015: £3,581,000).

16. Capital commitments – Group and Charity

	2016 £'000	2015 £'000
Authorised and contracted for	1,568	106
Authorised but not contracted for	1,341	1,755
Total Commitment	2,909	1,861

At the balance sheet date, £1,350,000 of capital commitments was authorised for refurbishment of 6 – 9 Carlton House Terrace, of which £471,000 had been contracted for by the year end. A further spend of £1,289,000 had been authorised on IT projects, of which £956,619 had been contracted for by the year end. £128,000 had been authorised for the historic maintenance of Chicheley Hall, of which £40,000 had been contracted for by the year end. Other general capital items total £142,000, of which £100,000 had been contracted for by the year end.

17. Heritage assets

The Society holds an extensive collection of heritage assets relating to the history of the Society itself and the wider history of scientific endeavour. The collection has four main components:

Printed works: The Library contains over 70,000 titles, published from the 1470s to the present day. The main strength of the collections is in the 17th and 18th centuries: from the 1680s to the mid-19th century, the policy of the Library was to acquire every important scientific publication.

Archives: These comprise an extraordinary and unrivalled record of the development of science that spans nearly 350 years. The archive collection is a unique resource for historians, particularly historians of science, containing over 250,000 items.

Pictures, sculptures, and other works of art: The collection includes over 6,000 photographs, engravings, and paintings of past and present Fellows.

Other artefacts: The collection comprises approximately 150 items and includes scientific instruments, furniture and furnishings, and the Society's Charter Book.

The collections are accessible to scholars and the wider public through the Royal Society's History of Science Centre, which includes a reference library and an extensive on-line presence, including fully searchable catalogue and image library.

Summary of heritage asset transactions

	Assets held at cost £'000	Assets held at valuation £'000	2016 £'000	2015 £'000
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Purchases/donations

At 1 April	36,125	13,081	49,206	48,720
Revaluation	—	—	—	371
Additions	56	15	71	115
Valuation or cost at 31 March	36,181	13,096	49,277	49,206

The heritage assets comprise:

Printed books	13,260	13,249
Archives	22,877	22,873
Pictures, sculptures and other works of art	9,369	9,314
Other artefacts	3,771	3,770
Total	49,277	49,206

The Printed Books and Archives were valued in August 2003 by Roger Gaskell, a rare book dealer and the pictures and other artefacts by Weller King, Fine Art Dealers, in May 2004. The valuations are on a fair market / replacement basis on those parts of the collection where it is felt such a valuation can be reasonably made. Assets are held at valuation as a proxy for cost.

The paintings and furniture at Chicheley Hall were valued in March 2015 by Weller King, Fine Art Dealers. The valuations are on a fair market / replacement basis on those parts of the collection where it is felt such a valuation can be reasonably made. The Trustees consider there to be no material impairment on the present market values / replacement values compared to those stated.

17. Heritage assets (continued)

Five year financial summary of heritage asset transactions

	2016 £'000	2015 £'000	2014 £'000	2013 £'000	2012 £'000
Purchases/donations					
Printed books	13	3	3	1	4
Archives	4	–	–	30	18
Pictures, sculptures and other works of art	54	–	19	–	7
Other artefacts	–	112	–	–	–
Total purchases/ donations	71	115	21	31	29

Donated heritage assets are recognised in the year they are received. There have been no disposals of heritage assets within the last five years.

Preservation and Management

Expenditure which in the Trustees' view is required to preserve or clearly prevent further deterioration of individual collection items is recognised in the Income and Expenditure account when it is incurred.

The Society has an ongoing cataloguing project and the Society's major strategic facilities for the long-term preservation of its historic archives, manuscripts and printed books are environmentally-controlled store rooms (conforming to British Standard 5454 ("Preservation of archival documents")).

The Society's modern records have been subject to a full audit, completed in April 2011. This process enabled the full-life management, destruction and permanent archiving of pertinent files. Conservation of damaged items is now underway.

Each of the Society's major collections (archives, modern records, printed books, pictures, journals, objects) has a designated member of curatorial staff and exhibited materials are looked after by an exhibitions manager. Collections are managed and recorded in discrete databases and according to the prevailing standard in each area (for example, International Standard Archival Description (ISAD) for archival cataloguing, SPECTRUM for museum standards and picture control).

18. Investments

	2016 £'000	2015 £'000
Valuation at 1 April	211,859	196,835
Additions of investments	18,076	20,687
Disposal of investments	(19,833)	(20,164)
Net change in cash invested for trades within portfolio	1,605	4,117
Investment management costs	(785)	(981)
Net cash added to portfolio	366	(1,500)
Net unrealised (losses)/ gains on valuation at 31 March	(11,243)	13,117
Exchange rate gains/ (losses) on valuation at 31 March	54	(253)
Valuation at 31 March 2016	200,099	211,858
Total historical cost at the end of the year	153,640	154,288

The valuation at 31 March 2016 comprises:

Investments listed on a recognised stock exchange including investments and unit trusts:		
UK	102,933	116,314
Overseas	71,405	71,314
Other unlisted securities:		
UK	4,406	3,683
Overseas	8,131	9,631
Cash:		
UK	7,084	7,412
Overseas	6,140	3,504
Total	200,099	211,858

Overseas investments comprise equities, unit/investment trusts and fixed interest funds.

The Society owns 100% of the issued share capital of The Royal Society Trading Limited (note 26).

The principal activity of the company is conferencing activities at Chicheley Hall.

The Society owns 100% of the issued share capital of the Royal Society (London) Ltd (note 26).

No business activity was undertaken from the date of incorporation to 31 March 2016.

Funds are invested as follows:

	2016 £'000	2015 £'000
Specific investments – Enterprise Fund	–	2,235
Specific investments – Amadeus RSEF	7,634	4,965
Specific investments – Theo Murphy Australia Fund	3,155	3,482
Pooled investments	189,310	201,176
Total	200,099	211,858

Reconciliation of investment gains

Unrealised gains / (losses)	(11,229)	13,119
Realised gains	427	753
Exchange rate gains / (losses) on valuation	54	(194)
Net (losses) / gains on investments as per statement of financial activities	(10,748)	13,678

19. Debtors

	2016 Receivable within one year £'000	2016 Receivable after one year £'000	2015 Receivable within one year £'000	2015 Receivable after one year £'000
Trade debtors	1,806	—	2,018	—
Grants receivable	750	1,000	500	1,750
Legacy receivable	2,325	—	1,446	—
Other debtors	125	—	178	—
Accrued income	989	—	983	—
Prepayments	343	—	252	—
Total	6,338	1,000	5,377	1,750

Included in the Group debtors are debtors of £92,000 (2015: £183,000) of Royal Society Trading Ltd.
All other debtors relate to the Charity.

The Charity holds a loan in respect of the Royal Society Trading Ltd of £647,000 (2015: £436,000).

20. Creditors

	2016 Due within one year £'000	2016 Due after one year £'000	2015 Due within one year £'000	2015 Due after one year £'000
Trade creditors	1,209	—	246	—
Publications advanced sales	3,319	—	3,109	—
Chicheley Hall advanced sales	206	—	228	—
Grants payable	1,472	—	1,323	—
Other creditors	391	51	965	76
Accruals and provisions	1,090	—	1,128	—
Deferred income	3,946	—	4,294	—
Total	11,633	51	11,293	76

Included in the Group creditors are creditors of £764,000 (2015: £706,000) relating to Royal Society Trading Ltd.
All other creditors relate to the Charity.

As at 31 March 2016, the charity owed Royal Society Trading Limited £48,000.

As required by FRS 102, included within accruals and provisions 2016 is a provision for a liability under the deficit recovery plan for the Universities Superannuation Scheme (USS) multi-employer pension scheme. A total amount of £184,000 has been provided for, comprising £12,000 due within one year and £173,000 due within more than one year. This provision has been calculated using the modeller developed by the British Universities Finance Directors Group (BUFDG), with the support of the USS trustee company, to provide a tool for estimating the liability under the recovery plan for accounting purposes. No transition adjustment to the comparative has been made on the basis of materiality.

Reconciliation of deferred income

	2016 £'000	2015 £'000
Deferred income brought forward	4,294	3,845
Amount released from previous year	(4,294)	(3,845)
Incoming resources deferred in the year	3,946	4,294
Total	3,946	4,294

21. Other assets

	2016 £'000	2015 £'000
Stock on hand		
Conference and catering	33	35
Bio fuel	9	9
Total	42	44
Cash at Bank		
Pounds Sterling	2,804	2,209
Foreign currency	1,245	230
Total	4,049	2,439

22. Analysis of net assets between funds – Group

	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2016 Total funds £'000	2015 Total funds £'000
Funds balances at 31 March 2016 are represented by:						
Tangible fixed assets	15,904	–	–	–	15,904	16,632
Heritage assets	49,277	–	–	–	49,277	49,206
Investments	27,466	41,658	28,836	102,139	200,099	211,858
Net current liabilities	(204)	–	–	–	(204)	(1,683)
Creditors: Due after one year	(51)	–	–	–	(51)	(76)
Defined benefit pension scheme liability	(8,613)	–	–	–	(8,613)	(10,665)
Net assets	83,779	41,658	28,836	102,139	256,412	265,272

The net current liabilities in 2016 are funded by investments, which could be realised to meet the net liabilities as they fall due.

22. Analysis of net assets between funds – Group (continued)
Comparative analysis of net assets between funds

	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2015 Total funds £'000
Funds balances at 31 March 2015 are represented by:					
Tangible fixed assets	16,632	–	–	–	16,632
Heritage assets	49,206	–	–	–	49,206
Investments	30,766	42,792	30,487	107,813	211,858
Net current liabilities	(1,683)	–	–	–	(1,683)
Creditors: Due after one year	(76)	–	–	–	(76)
Defined benefit pension scheme liability	(10,665)	–	–	–	(10,665)
Net assets	84,180	42,792	30,487	107,813	265,272

23. Movements on Trust and specific funds in year – Group

	Brought forward at 1 April 2015 £'000	Income £'000	Expenditure £'000	Transfers £'000	Investment and actuarial gain / (loss) £'000	Carried forward at 31 March 2016 £'000
Permanent endowment funds						
General Trust Fund	2,092	–	(5)	–	(108)	1,979
International Trust	1,380	–	(4)	–	(71)	1,305
Life Sciences Trust	12,633	–	(33)	–	(653)	11,947
Maths and Physical Sciences Trust	11,588	–	(30)	–	(599)	10,959
RW Paul Instrument Fund	12,426	–	(32)	–	(642)	11,752
Crowley-Milling Fund	1,875	240	(5)	–	(97)	2,013
Other	6	–	–	–	–	6
Theo Murphy – UK	59,558	–	(155)	–	(3,078)	56,325
Theo Murphy – Australia	2,574	–	–	–	(272)	2,302
Royal Society Pensioners Relief Fund	181	–	–	–	(9)	172
EPA Cephalosporin Research Fund	3,500	–	–	–	(121)	3,379
Total permanent endowment funds	107,813	240	(264)	–	(5,650)	102,139

23. Movements on Trust and specific funds in year – Group (continued)

	Brought forward at 1 April 2015 £'000	Income £'000	Expenditure £'000	Transfers £'000	Investment and actuarial gain / (loss) £'000	Carried forward at 31 March 2016 £'000
Expendable endowment funds						
General Trust Fund	11,651	–	(30)	–	(602)	11,019
International Trust	331	–	(1)	–	(17)	313
Life Sciences Trust	7,404	–	(19)	–	(383)	7,002
Maths and Physical Sciences Trust	4,032	–	(10)	–	(208)	3,814
Science Policy Endowment	2,344	–	(6)	–	(121)	2,217
Kenneth Murray Fund	2,109	–	(5)	–	(108)	1,996
Education Endowment	1,339	–	(3)	–	(69)	1,267
GSK Endowment	1,277	–	(3)	–	(66)	1,208
Total expendable endowment funds	30,487	–	(77)	–	(1,574)	28,836
Restricted funds						
International Trust	1,095	69	(287)	(118)	(62)	697
Life Sciences Trust	9,020	718	(1,187)	(105)	(479)	7,967
EPA Cephalosporin Research Fund	–	55	(6)	(4)	1	46
Maths and Physical Sciences Trust	7,857	583	(614)	(79)	(408)	7,339
Science Policy Endowment	(35)	55	(80)	59	1	–
Education Endowment	(11)	32	(40)	19	–	–
GSK Endowment	74	32	(2)	(5)	(3)	96
RW Paul Instrument Fund	151	297	(129)	(44)	(5)	270
Crowley-Milling Fund	58	45	–	(4)	(2)	97
Royal Society Pensioners Relief Fund	34	5	–	(1)	(2)	36
Enterprise Fund	7,346	8	(202)	(17)	639	7,774
Andrew Fund	1,750	74	(4)	(4)	(89)	1,727
Noreen Murray Fund	2,462	59	(130)	(9)	(129)	2,253
Forrest Fund	2,268	53	(6)	(5)	(116)	2,194
Nutrition in Old Age Fund	4,763	112	(12)	(11)	(244)	4,608
Project Funds	–	–	–	–	–	–
DFID Africa Awards and Grants	–	1,757	(1,668)	(89)	–	–
Industry Programme	(1)	582	(1,536)	955	–	–
Leverhulme Africa Awards	437	813	(693)	(32)	–	525
Wolfson Research Merit Grants	–	1,199	(3,199)	2,000	–	–
Other	1,474	2,739	(2,786)	244	–	1,671
BIS Science and Research	6	46,109	(43,127)	(2,982)	–	6
BIS Newton Fund	–	4,044	(3,901)	(143)	–	–
Theo Murphy – UK	1,620	1,584	(657)	(345)	(68)	2,134
Theo Murphy – Australia	1,128	131	(185)	(10)	–	1,064
The Wolfson Research Professorship of the Royal Society	1,284	32	(143)	(7)	(69)	1,097
Kenneth Murray Fund	12	50	–	(5)	–	57
Total restricted funds	42,792	61,237	(60,594)	(742)	(1,035)	41,658

23. Movements on Trust and specific funds in year – Group (continued)

	Brought forward at 1 April 2015 £'000	Income £'000	Expenditure £'000	Transfers £'000	Investment and actuarial gain / (loss) £'000	Carried forward at 31 March 2016 £'000
Unrestricted funds						
General Trust Fund	13,890	680	(494)	(67)	(715)	13,294
BIS Science and Research	–	992	(992)	–	–	–
Revaluation Reserve	47,856	–	–	–	–	47,856
Defined Benefit Pension Reserve	(10,665)	–	352	–	1,700	(8,613)
Other	–	–	–	–	–	–
General Purpose	33,099	14,561	(15,453)	809	(1,774)	31,242
Total unrestricted funds	84,180	16,233	(16,587)	742	(789)	83,779
Total for all trusts						
General Trust Fund	27,633	680	(529)	(67)	(1,425)	26,292
International Trust	2,806	69	(292)	(118)	(150)	2,315
Life Sciences Trust	29,057	718	(1,239)	(105)	(1,515)	26,916
Maths and Physical Sciences Trust	23,477	583	(654)	(79)	(1,215)	22,112
RW Paul Instrument Fund	12,577	297	(161)	(44)	(647)	12,022
Crowley-Milling Fund	1,933	285	(5)	(4)	(99)	2,110
Theo Murphy – UK	61,178	1,584	(812)	(345)	(3,146)	58,459
Theo Murphy – Australia	3,702	131	(185)	(10)	(272)	3,366
Royal Society Pensioners Relief Fund	215	5	–	(1)	(11)	208
EPA Cephalosporin Research Fund	3,500	55	(6)	(4)	(120)	3,425
Science Policy Endowment	2,309	55	(86)	59	(120)	2,217
Kenneth Murray Fund	2,121	50	(5)	(5)	(108)	2,053
Education Endowment	1,328	32	(43)	19	(69)	1,267
GSK Endowment	1,351	32	(5)	(5)	(69)	1,304
Enterprise Fund	7,346	8	(202)	(17)	639	7,774
Andrew Fund	1,750	74	(4)	(4)	(89)	1,727
Noreen Murray Fund	2,462	59	(130)	(9)	(129)	2,253
Forrest Fund	2,268	53	(6)	(5)	(116)	2,194
Nutrition in Old Age Fund	4,763	112	(12)	(11)	(244)	4,608
Project Funds						
DFID Africa Awards and Grants	–	1,757	(1,668)	(89)	–	–
Industry Programme	(1)	582	(1,536)	955	–	–
Leverhulme Africa Awards	437	813	(693)	(32)	–	525
Wolfson Research Merit Grants	–	1,199	(3,199)	2,000	–	–
Other	1,480	2,739	(2,785)	243	–	1,677
BIS Science and Research	6	47,101	(44,119)	(2,982)	–	6
BIS Newton Fund	–	4,044	(3,901)	(143)	–	–
The Wolfson Research Professorship of the Royal Society	1,284	32	(143)	(7)	(69)	1,097
Revaluation Reserve	47,856	–	–	–	–	47,856
Defined Benefit Pension Reserve	(10,665)	–	352	–	1,700	(8,613)
General purpose	33,099	15,549	(16,442)	810	(1,774)	31,242
Total	265,272	77,710	(77,522)	–	(9,048)	256,412

23. Movements on Trust and specific funds in year (continued)

Purposes of funds

The objects of the **General Fund** are to promote and advance for the general benefit of the public, including the scientific (science, medicine, engineering and technology) community, the efficiency and effectiveness of the Royal Society and its Fellowship. This shall be done in particular by establishing, promoting, supporting and maintaining, for the general benefit of the public and the scientific community, its activities, premises, fixtures and fittings, equipment, libraries and archives, general publications and the history of science.

The objects of the **International Fund** are to promote and advance for the general benefit of the public, including the scientific (science, medicine, engineering and technology) community, the study and investigation of, and research into all areas of science internationally. This shall be done in particular by promoting and carrying out international scientific collaboration, encouraging international interchange between scientists, advancing the engagement of the public in matters related to such international science, and providing the best possible scientific advice and information on international scientific policy.

The objects of the **Life Sciences Fund** are to promote and advance for the general benefit of the public, including the scientific (science, medicine, engineering and technology) community, the study and investigation of, and research into all areas of life sciences and other science at the interface between this area and other areas of science. This shall be done in particular by supporting scientists working in this area, advancing engagement of the public in all matters relating to such science and providing the best possible scientific advice and information to those making policy in the area of life science.

The objects of the **Mathematics and Physical Sciences Fund** are to promote and advance for the general benefit of the public, including the scientific (science, medicine, engineering and technology) community, the study and investigation of, and research into all areas of mathematics and physical sciences and other science at the interface between this area and other areas of science. This shall be done in particular by supporting scientists working in this area, advancing engagement of the public in all matters relating to such science and providing the best possible scientific advice and information to those making policy in the area of mathematics and physical science.

Following the Deed of retirement of the other trustees the property and investments of the **RW Paul Instrument Fund** were transferred to the sole remaining trustee being the Royal Society. The application of the income from the portfolio is restricted to the provision of grants under the Paul Instrument Grants Scheme.

The **Crowley-Milling Fund** was established following a generous legacy from Gladys and Michael Crowley-Milling. The income from this fund is restricted to the promotion and encouragement of research in the physical sciences and their application especially for the support of young scientists.

The **Theo Murphy Funds** (in the UK and Australia) were created through a bequest from the estate of the late Theo Murphy. The funds "shall be used or applied to further scientific discovery in the fields of medicine, science, technology and engineering". The Australia Fund will carry out activities in Australia in accordance with the will.

The **Royal Society Pensioners Fund** was founded in 1919. By the wish of the original donors the capital is to remain intact and the income to be applied to the payment of pensions for servants of the Society and to make lump sum payments to Royal Society pensioners in need.

The **Royal Society EPA Cephalosporin Research Fund** was established following a generous donation from The EPA Cephalosporin Research Fund. The income from this fund will permanently endow a research professorship in the biological and medical sciences. It will be awarded every 10 years and the holder will be named the Royal Society EP Abraham Professor.

The **Science Policy Endowment** was established following donations received from Sir Tom McKillop FRS and the Kohn Foundation to support the Science Policy Centre.

The **Kenneth Murray Fund** was established following a generous legacy from Sir Kenneth Murray FRS to be held as an expendable endowment for a Royal Society Professorship.

The **Education Policy Endowment** was established from a generous donation from the Gatsby Foundation to support the Society's education policy work.

23. Movements on Trust and specific funds in year (continued)

The **GSK Endowment** was established from donated funds to be held as an expendable endowment for the advancement of research in the field of medical science by the establishment of a Royal Society Professorship.

The **Enterprise Fund** was created by generous donations in support of the Society in making equity investments in innovative early-stage businesses emerging from the science base in the UK and elsewhere.

The **Andrew Fund** was established following a generous legacy from Dr Sydney Percy Smith Andrew FREng FRS to be used for the purpose of promoting and establishing research for the advancement of natural knowledge particularly in interdisciplinary fields of understanding.

The **Noreen Murray Fund** was established following a generous legacy from Lady Noreen Murray FRS for the support of research in neurological science.

The **Forrest Fund** was established following a generous legacy for the support of British post doctorate electrical research in memory of Professor John Samuel Forrest.

The Society has accepted a donation to be applied to the study of **nutrition in old age**.

Other project funds comprise monies received to fund separate restricted projects in line with our charitable activities and are held as separate individual funds in our accounts.

The **DFID Africa Awards and Grants** are a programme for scientists who wish to develop collaborative research consortia between scientists in sub-Saharan Africa and a research institution in the UK.

The **Industry Programme** is for academic scientists who wish to work on a collaborative project with industry and for scientists in industry who wish to work on a collaborative project within an academic organisation.

The **Leverhulme Africa Awards** are for scientists who wish to develop a collaborative research project between the UK and research institutions in either Ghana or Tanzania.

The **Wolfson Research Merit Grants** is a scheme to enhance over a five-year period the salaries of outstanding scientists in order to recruit and retain them in the UK. £2m of funding received from the Department for Business, Innovation and Skills (BIS) was transferred into the fund this year to support the scheme.

The Society receives a grant from **BIS**. This supports work on scientific excellence and innovation, science and mathematics education, international activities and science communication activities. £2.98m of BIS funding appears in transfers this year. This mainly comprises the £2m contribution to Wolfson Research Merit Grants as described above as well as a £955,000 contribution to Industry Fellowships.

The **Newton Fund** is a programme to develop science and innovation partnerships between the UK and Newton Fund countries to enable a well-trained research community with the ability to conduct high quality research.

Following the deed of retirement of the other trustees the investments of the **Wolfson Research Professorship of the Royal Society** were transferred to the sole remaining trustee being the Royal Society. The application of the income from the portfolio is restricted to support the Wolfson Research Professorship.

The **Revaluation Reserve** relates to the revaluation of the heritage assets.

The **transfers** between projects and funds include administration charges of the investments held in the trusts, administration costs reclaimed from projects where applicable, notional interest paid to projects in respect of income held during the year and any income released to the general reserves at the end of projects (where allowed under the gift or grant agreement).

24. Financial Commitments – Group and Charity

At 31 March 2016 the Society had the following commitments:

Total future minimum lease payments under a non-cancellable operating lease in respect of occupation of 6 – 9 Carlton House Terrace, London is as follows for each of the following periods:

	2016 £'000	2015 £'000
Less than one year	490	490
One to five years	1,960	1,960
Over five years	21,070	21,560
Total	23,520	24,010

The lease is due to expire on 5 January 2064 however the next 10 yearly rent review is due on 5 January 2025.

Agreements and commitments to fund research professorships / fellowships and other grants totalling £120,000,000 (2015: £110,000,000). Of these, £47,000,000 (2015: £42,000,000) are due in less than one year, and £73,000,000 (2015: £67,000,000) in between two and five years. There are no grants payable in more than five years. As the Society retains the discretion to terminate these grants they are treated as liabilities of future periods and will be financed by specific grants or other income receivable in those periods.

The Society has entered into investment contract commitments totalling £724,000 (2015: £831,000) payable at dates yet to be agreed.

25. Pension obligations – Group and Charity

The Royal Society (“the Employer”) operates two pension schemes and contributes to the Universities Superannuation Scheme (USS).

The Royal Society Group Personal Pension Plan is a defined contribution scheme which came into existence on 1 October 2013 and is open to all employees. During the year ended 31 March 2016 employer contributions to this scheme totalled £184,000 (2015: £140,000).

Three members of the Society’s staff are active members of **USS**, a defined benefit scheme (2015: three members). During the year ended 31 March 2016, employer contributions to this scheme totalled £79,000 (2015: £70,000). There are also three deferred members of the scheme (2015: three members).

USS is a defined benefit scheme which is externally funded and contracted out of the State Second Pension (S2P) and valued every three years by professionally qualified independent actuaries using the Projected Unit Method. The scheme is a “last man standing” scheme which means that in the event that another member institution becomes insolvent the other participating members will pick up any funding shortfall.

It is not possible to identify the Society’s share of the underlying assets and liabilities of the USS and hence contributions are accounted for as if it was a defined contribution scheme. However, FRS 102 requires that deficit recovery plans for multi-employer pension schemes such as USS need to be recognised as a provision for a liability. As a result of this change, an initial liability of £184,000 has been charged to the Statement of Financial Activities during 2015/16 and recorded as a liability on the balance sheet to be unwound over time (initially over the period to 2031) as the liability is discharged. This provision has been calculated using the modeller developed by the British Universities Finance Directors Group (BUFDG), with the support of the USS trustee company, as a tool for estimating the liability under the recovery plan for accounting purposes. Each triennial valuation will result in an adjustment to the value of the provision recorded on the balance sheet.

The rates of contribution for the USS are determined on the advice of actuaries, the cost recognised for the year in the Statement of Financial Activities being equal to the contribution to the scheme.

25. Pension obligations – Group and Charity (continued)

The latest actuarial valuation of the scheme was at 31 March 2011 using the Projected Unit Method. The assumption and other data which have the most significant effect on the determination of the contribution levels are as follows:

	Past service	Future service
Investment returns per annum	6.10%	6.10%
Salary scale increases per annum – short term	3.65%	3.65%
Salary scale increases per annum – long term	4.40%	4.40%
Pension increases per annum – for three years following valuation	3.40%	3.40%
Pension increases per annum – thereafter	2.60%	2.60%
Market values of assets at last actuarial valuation date	£32,434m	£32,434m
Proportion of members' accrued benefits covered by the actuarial value of assets	92.00%	92.00%
Current Employers contribution rate	16.00%	16.00%

As a result of an ongoing consultation concerning the assumptions underlying the technical provisions of the scheme, the triennial valuation as at 31 March 2014 is still pending. An estimate based on updated assumptions and provisions indicated that the deficit at the valuation date of 31 March 2014 would have been £5.4bn. The estimate for 31 March 2015 indicated that this deficit had increased to £8.3bn. Further information can be found at uss.co.uk

The Royal Society operates a defined benefit pension arrangement in the UK called the **Pension and Life Assurance Plan of the Royal Society** ("the Plan"), with assets held in a separately administered fund. The Plan provides retirement benefits on the basis of members' final salary. The Plan is closed to new members, although remains open to future benefit accrual, and provides benefits on a defined benefit basis.

The most recent valuation of the Plan under FRS 102 was an approximate update carried out as at 31 March 2016. The valuation of the Plan used the projected unit method and was carried out by Barnett Waddingham LLP, professionally qualified actuaries.

The FRS 102 liability does not include any allowance for discretionary benefits. The Employer expects to make contributions to the Plan during the year to 31 March 2017 of around £1,213,000.

The Plan is subject to the Statutory Funding Objective under the Pensions Act 2004. A valuation of the Plan is carried out at least once every three years to determine whether the Statutory Funding Objective is met. As part of the process the Employer must agree with the trustees of the Scheme the contributions to be paid to address any shortfall against the Statutory Funding Objective and contributions to pay for future accrual of benefits.

The full actuarial valuation at 1 January 2013 showed an increase in the deficit from £2,791,000 to £4,744,000. It has been agreed with the Trustees that contributions to make good the deficit will be payable as follows:

- £236,000 on or before 31 December 2013;
- £500,000 on or before each 30 April 2014, 31 October 2014, 30 April 2015 and 31 October 2015; and
- £358,500 on or before each 30 April and 31 October in the years 2016 to 2020 inclusive.

Contributions payable by the Employer in respect of future benefit accrual are at the rate of 13.2% of pensionable salaries. The Society also pay £1,420 per month to the Plan in respect of expenses. Members' contributions are 7% of pensionable salaries. Life cover and dependants' pensions in respect of death in service are provided by additional insurance premiums.

25. Pension obligations – Group and Charity (continued)

The actuarial valuation as at 1 January 2016 is currently in progress. The Principal assumptions used to calculate Plan liabilities include:

	2016 % pa	2015 % pa
Inflation (RPI)	3.3	3.3
Inflation (CPI)	2.3	2.3
Salary escalation	2.0	2.3
Increase to pensions in payment* – subject to LPI minimum 4%	4.1	4.1
Increase to pensions in payment* – subject to LPI	3.3	3.3
Statutory revaluation	2.3	2.3
Discount rate (pre- and post-retirement)	3.7	3.4
Pre-retirement mortality table	S1NA	S1NA
Post-retirement mortality table	S1NA	S1NA
Post-retirement mortality projection	CMI 2014 projections with LTR of 1.5	CMI 2014 projections with LTR of 1.5
Tax free cash	15% of pension	15% of pension
Withdrawals	None	None

*Pensions in payment increase by the lesser of the annual increase in the retail price index or 5%. For service prior to 1 November 2001 this is subject to a minimum increase of 4%.

Under the mortality tables and projections adopted, the assumed future life expectancy at age 60 is as follows:

	2016	2015
Male currently aged 40	29.8 years	29.7 years
Female currently aged 40	32.6 years	32.5 years
Male currently aged 60	27.5 years	27.4 years
Female currently aged 60	30.2 years	30.1 years

The assets in the Plan were:

	Value at 31 March 2016 £'000	Value at 31 March 2015 £'000
Equities	15,898	26,889
Bonds	7,247	3,015
Gilts	–	1,001
Property	–	339
Cash	124	1,305
Diversified growth	8,845	–
Annuity policies	7,186	7,584
Total market value of Plan assets	39,300	40,133
Present value of scheme liabilities	(47,913)	(50,798)
Net pension liability	(8,613)	(10,665)

The assets do not include any investment in shares of the Employer.

25. Pension obligations – Group and Charity (continued)

Reconciliation of present value of scheme liabilities

	Value at 31 March 2016 £'000	Value at 31 March 2015 £'000
Defined benefit obligation at 1 April	50,798	42,795
Current service cost	632	1,319
Contributions by Plan participants	190	235
Past service cost	–	(2,524)
Interest cost	1,704	1,906
Benefits paid	(1,567)	(1,122)
Change due to settlements or curtailments	–	–
Experience (gain) /loss on liabilities	(656)	2,431
Changes to demographic assumptions	–	(1,666)
Changes to financial assumptions	(3,188)	7,424
Defined benefit obligation at 31 March	47,913	50,798

Reconciliation of fair value of scheme assets

	Value at 31 March 2016 £'000	Value at 31 March 2015 £'000
Fair value of scheme assets at 1 April	40,133	35,687
Interest on assets	1,364	1,619
Contributions by the Employer	1,524	1,578
Contributions by Scheme participants	190	235
Benefits paid	(1,567)	(1,122)
Administration costs	(200)	(121)
Return on Plan assets less interest	(2,144)	2,257
Change due to settlements or curtailments	–	–
Fair value of scheme assets at 31 March	39,300	40,133

The actual return on Plan assets in the year was (£0.78m) (2015: £3.76m).

Analysis of the amount charged to the statement of financial activities – operations

	Value at 31 March 2016 £'000	Value at 31 March 2015 £'000
Current service cost	632	1,319
Administration costs	200	121
Interest cost	1,704	1,906
Interest on assets	(1,364)	(1,619)
(Gain) /Losses on settlements or curtailments	–	–
Past service credit	–	(2,524)
Total charge / (credit)	1,172	(797)

25. Pension obligations – Group and Charity (continued)

Actuarial gains and losses

	Value at 31 March 2016 £'000	Value at 31 March 2015 £'000
Losses / (gains) on scheme assets in excess of interest	2,144	(2,257)
Experience (gains) / losses on liabilities	(656)	2,431
Gains from changes to demographic assumptions	–	(1,666)
(Gains)/ losses from changes to financial assumptions	(3,188)	7,424
Actuarial losses / (gains)	(1,700)	5,932

26. Subsidiary undertakings

The Society owns 100% of the £1 called-up and issued share capital of Royal Society Enterprise Fund Limited 06480372. The Company was dissolved on 1 March 2016 after management of the Enterprise Fund was taken over by Amadeus Capital.

The Society also owns 100% of the £1 called-up and issued share capital of Royal Society Trading Limited 06967016. Royal Society Trading Limited company has been set up to process the activities that occur at Chicheley Hall.

The Society also owns 100% of the £1 called-up and issued share capital of The Royal Society (London) Ltd 08808518. The Royal Society (London) Ltd company was incorporated on 10 December 2013, has been set up to process certain trading activities that occur at 6 – 9 Carlton House Terrace and has had no activity in the year.

	2016 £'000	2015 £'000
Results of Royal Society Trading Limited for the year ended 31 March 2016:		
Trading income	2,161	2,086
Cost of sales	(2,118)	(2,079)
Gross profit	43	7
Administrative expenses	(51)	(50)
Operating loss	(8)	(43)
Interest on loan account	(12)	(12)
Result for the period	(20)	(55)
Total funds brought forward at 1 April	(463)	(408)
Total funds carried forward at 31 March	(483)	(463)

26. Subsidiary undertakings (continued)
Balance Sheet of Royal Society Trading Limited as at 31 March 2016:

	2016 £'000	2015 £'000
Current assets		
Stock	21	25
Debtors	140	183
Cash at bank and in hand	768	477
	929	685
Creditors: amounts falling due within one year	(1,412)	(1,148)
Net Current Liabilities	(483)	(463)
Capital and reserves		
Called up share capital	—	—
Profit & loss reserve	(483)	(463)
Shareholder's funds	(483)	(463)

Royal Society Trading Limited has called up share capital of £1.

Royal Society (Australia) Pty Limited ACN 126112678 is the Trustee of the Royal Society Theo Murphy (Australia) Fund. It is an Australian company the shares of which are owned by the Society.

27. Other funds – Group and Charity

The Society is the beneficiary of the following funds:

	2016 investment market total £'000	2015 investment market value total £'000
Curl Fund The investments for this fund are held and managed by the New Zealand Public Trust Office	112	115
Horace Le Marquand And Dudley Bigg Trust The investments of the permanent endowment of the Trust are held and managed by Salamanca Group Trust (Jersey) Ltd. The Trustees are Investec Trust (Jersey) Limited.	476	507

28. Post balance sheet events

On 23 June 2016 the UK electorate voted to leave the European Union. The impact of this decision is not yet fully understood but it is likely to affect the Royal Society's activities for the foreseeable future. The Society will continue to work with its partners and stakeholders to ensure that the interests of science are protected as the UK transitions into new arrangements with Europe. The volatility and uncertainty created by the result of the referendum may also have implications for future funding streams and the Society will continue to monitor its financial position to ensure any emerging risks are mitigated as far as possible and that the charity continues to meet its charitable aims.



Image

Royal Society Science
Museum 'Lates': The
next big thing event,
June 2015.



ROYAL SOCIETY

SCIENCE MUSEUM



The Royal Society is a self-governing Fellowship of many of the world's most distinguished scientists drawn from all areas of science, engineering, and medicine. The Society's fundamental purpose, as it has been since its foundation in 1660, is to recognise, promote, and support excellence in science and to encourage the development and use of science for the benefit of humanity.

The Society's strategic priorities emphasise its commitment to the highest quality science, to curiosity-driven research, and to the development and use of science for the benefit of society.

These priorities are:

- Promoting science and its benefits
- Recognising excellence in science
- Supporting outstanding science
- Providing scientific advice for policy
- Fostering international and global cooperation
- Education and public engagement

For further information

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