

Royal Astronomical Society

Annual Report and Accounts

31 December 2017

Charity Registration Number 226545

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Reference and administrative details of the charity, its trustees and advisers DRAFT

Patron Her Majesty the Queen

Trustees The Council members who served during 2017 were:

Professor John Zarnecki (President from May 2016, G, Open University)
Professor Mike Cruise (President Elect from May 2017, A, University of Birmingham)
Professor Yvonne Elsworth (Vice President, G, University of Birmingham)
Professor Don Kurtz (Vice President until May 2017, A, University of Central Lancashire)
Professor Christine Peirce (Vice President until May 2017, G, University of Durham)
Professor Hiranya Peiris (Vice President, A, University College London)
Mr Charles Barclay (Vice President from May 2017, A)
Dr Nigel Berman (Treasurer from May 2016, A)
Professor Ian Crawford (Senior Secretary until May 2017 and Vice-President from May 2017, G, Birkbeck College)
Dr Mandy Bailey (Secretary, A, Open University)
Professor Mark Lester (Secretary from May 2017, G, University of Leicester)
Professor Lyndsay Fletcher (Secretary until May 2017 and Senior Secretary from May 2017 G, University of Glasgow)
Professor Mike Bode (Councillor, A, Liverpool John Moores University)
Professor Martin Bureau (Councillor until May 2017, A, University of Oxford)
Dr Paul Daniels (Councillor, A)
Professor Brad Gibson (Councillor, A, University of Hull)
Dr Stacey Habbergham (Councillor until May 2017, A, Liverpool John Moores University)
Dr Caitriona Jackman (Councillor, G, University of Southampton)
Miss Jane MacArthur (Councillor until May 2017, G, University of Leicester)
Professor Stephen Serjeant (Councillor, A, Open University)
Dr Sheila Peacock (Councillor, G, AWE Blacknest)
Dr Sara Russell (Councillor until May 2017, G, Natural History Museum)
Professor Giovanna Tinetti (Councillor, A, University College London)
Professor Mike Watson (Councillor, A, University of Leicester)
Dr Megan Argo (Councillor, A, from May 2017, University of Central Lancaster)
Mr Mark Woodland (Councillor, A, from May 2017)
Professor Steven Miller (Councillor, G, from May 2017, University College London)
Dr Clare Watt (Councillor, G, from May 2017, University of Reading)

Trustees [Note: “A” signifies all areas of astronomy & astrophysics; “G”
(continued) covers geophysics, solar-terrestrial physics and planetary sciences, respectively.]

Reference and administrative details of the charity, its trustees and advisers DRAFT

Senior Staff Executive Director: Philip Diamond (from January 2018)
Executive Director: Pamela Mortimer (until June 2017)
Deputy Executive Director: Robert Massey

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Principal Office** Burlington House
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**Charity
registration
number** 226545

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Bankers HSBC Bank plc
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National Westminster Bank
St James' & Piccadilly Branch
PO Box 2 DG
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London
SWJ 9HE

**Investment
managers** Newton Investment Management Ltd
The Bank of New York Mellon Centre
160 Queen Victoria Street
London
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Solicitors Bristows
3 Lincoln's Inn Fields
London
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Foreword from the President

2017 witnessed the enormous breadth of activities undertaken by the Society. For its bicentenary in 2020, the Society established RAS200, an ambitious programme of outreach projects in partnership with organisations that enabled us to reach more diverse audiences. The first six projects are getting into their stride and we have now awarded a further six grants in the second tranche of funding.

Our engagement beyond our own Fellowship continued to grow, with more than 5000 individuals attending outreach events in Burlington House and elsewhere. A highlight was the 'Courtyard Lates' event which took place in August. The focus for our engagement with policy-makers was the impact of Brexit and of the new Industrial Strategy on astronomy and geophysics. 2017 saw Research England preparing for the Research Excellence Framework which will take place in 2021. The Society put forward a comprehensive set of names for our relevant panels.

Much of our diversity work has involved gathering evidence, such as our Demographic Survey. Such evidence is crucial to inform the future direction of the Society's work. I was very pleased to see the Society, alongside our sister Societies, the Institute of Physics and the Royal Society of Chemistry, set up the LGBT+ physical science network, enabling us to be more responsive to this community.

Our media work continues to be highly effective with press releases being picked up by the major news channels, national newspapers and the popular scientific press.

Communicating science through our publications: Monthly Notices of the Royal Astronomical Society, Geophysical Journal International and Astronomy and Geophysics, remains at the heart of the Society's work. It is pleasing to see that we are engaging with an ever-increasing proportion of our community as evidenced by a significant increase in the number of full-text downloads.

The Society has a world-class collection in astronomy and geophysics housed in our library in Burlington House. We delivered an innovative programme for visiting primary school children and produced a series of videos about items in the collection, each video averaging 24 000 views.

Our monthly scientific meetings are the heartbeat of the Society. They are very well attended, because they attract an extra-ordinarily distinguished list of speakers.

The University of Hull hosted a very successful 2017 National Astronomy Meeting, which we planned to coincide with the year that Hull was designated City of Culture. In all, more than a thousand people attended the scientific programme and outreach activities.

The report that follows describes the Society's work in 2017. Our disciplines of astronomy and geophysics continue to make an important scientific, cultural and economic contribution to Society. As we approach our bicentenary in 2020, the trustees, fellows and staff of the Society are committed to ensuring our disciplines continue to flourish long into the future.


President

The Trustees present their report together with the accounts of The Royal Astronomical Society (the "Society" or "RAS") for the year ended 31 December 2017.

The accounts have been prepared in accordance with the accounting policies set out on pages 30 to 35 and comply with the Society's Royal Charter and Bye Laws, the Charities Act 2011 and Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102).

OBJECTIVES

The RAS exists to advance, and to record the history of, our understanding of the Earth, the solar system, the stars and galaxies, and the nature of the universe. It does this by promoting Astronomy and Geophysics, interdisciplinary sciences that encompass and further our understanding of physics, chemistry, mathematics, biology, engineering and computer science to answer deep questions about the origin and fate of the cosmos, and people's place in it. Through this the Society contributes to the growth and dissemination of knowledge and thereby fulfils its charitable objective of serving the public interest.

The Society refers to the Charity Commission's general guidance on Public Benefit when reviewing its aims and objectives and in planning future activities. These disclosures comply with the Charities Act 2011.

The Society's principal objectives for 2017 were to:

- ◆ ensure that Government and other bodies are aware of the requirement for sustained and significant public funding of astronomy and geophysics research and teaching and the benefits that this brings to the UK and wider society
- ◆ broaden its engagement with the public through the provision of education, outreach and diversity projects.
- ◆ respond to international developments where they have a potential impact on astronomy and geophysics.
- ◆ assemble evidence on the health of the astronomy and geophysics communities to support our political engagement.
- ◆ publish the results of the Demographic Survey commissioned in 2016 which, in combination with our earlier membership survey and with UCAS data, will give a picture of the demographic composition and research interests of the communities we represent.

SIGNIFICANT ACHIEVEMENTS

RAS200: Sky and Earth

For its bicentenary in 2020, the Royal Astronomical Society established a network of enhanced and extended outreach projects, spreading the enthusiasm for astronomy and geophysics that RAS Fellows share to people who have never experienced the subjects or never thought that they could participate. RAS200 projects involve partner organizations whose specialist knowledge brings effective ways to share our sciences. The first six projects are getting into their stride. In 2017 the Society extended the programme, awarding a further six grants in the second and final tranche of funding. The recipients, selected from a highly competitive field were:

Reaching for the Stars: Adventures in Space for Girls and Young Women is a project involving Girlguiding and the UK Space Agency, to include astronomy, space and planetary science in the range of activities and opportunities they provide.

The Bounce Back Foundation supports prisoners and ex-offenders in London and the southeast, focusing on employment and on improving conditions in prisons. Beyond Prison Walls aims to spark interest in astronomy, geophysics, planetary and space science among prisoners, their families and local communities. The project will make use of virtual reality techniques – literally expanding the horizons of the prisoners.

The National Youth Agency will work in partnership with the National Space Centre and Leicester City Football Club Community Trust to deliver 30 sport-inspired workshops that encourage an understanding of the physical properties of the earth and how it influences our lives.

Big Data South Africa is an interactive public exhibition that will be accompanied by associated public, teacher, learner, student and scout based workshops and materials. The aim of the exhibition and associated activities is to raise awareness about the contributions of astronomy to South Africa and to the world, as well as to illuminate the history of and the future for astronomical “big data”.

Making Space Galway will embed astronomy and geophysics in that culture and use it as a springboard to reach marginalized groups such as people in disadvantaged communities, asylum seekers and Travellers.

The Cornwall Sea to Stars Roadshow will use a mobile science outreach unit to visit remote communities in Cornwall, presenting astronomy and geophysics in terms of their local connections, such as fishing and navigation.

SIGNIFICANT ACHIEVEMENTS (continued)

Public Engagement

In 2017 the Society worked with nearly 5000 people face to face, at onsite and offsite events. Some highlights were the primary school workshops, and the 'Courtyard Lates' event that took place in Burlington House in August. The 12 students on the GCSE Astronomy class run by the Society, who come from a diverse range of London schools, passed the exam in the summer.

Our outreach officer is one of nine Space Ambassadors in the UK and worked with the European Space Education Resource Office to deliver schools activities across London and the southeast. She secured a total of £15,000 in grants from ESERO, the Ogden Trust and the STFC, and spoke at the US Embassy and the London Science Communication Symposium. With the RAS Librarian, she presented at the Discovering Collections, Discovering Communities event for library, archive and museum professionals.

The Society produced six new videos on the Objectivity YouTube channel featuring artefacts in the Society's heritage collection and discussions on key people in the history of astronomy. The videos have been viewed more 150,000 times.

The Society hosted a series of popular 45-minute lunch or evening-time lectures for non-specialists, at which members of the public can listen to leading scientists talk about their work and details can be found in the Appendix on page 55.

Diversity

Much of our diversity work has involved evidence gathering (such as our Demographic Survey, results of which were published in an A&G article).

In 2017 the Society set up the LGBT+ physical science network with the Institute of Physics and the Royal Society of Chemistry and supported the LGBT STEMinar in Sheffield. Our Diversity Officer spoke at a London screening of 'Hidden Figures', covering the female BAME mathematicians, engineers and programmers who supported the Apollo programme. This was a special screening for students from minority groups in the capital.

Media

In 2017 the Society issued 51 press releases, on results in our journals, papers presented at the National Astronomy Meeting (NAM) held in Hull, and policy and staff announcements. These were picked by local, national and international outlets including BBC local and national TV and radio stations, ITN, Channel 4, the Guardian, Independent, International Business Times, Daily Mail, Sun, Daily Record, Science Daily, space.com, New Scientist and Scientific American. NAM alone generated more than 450 pieces of press coverage, and BBC Humberside broadcast from the conference.

SIGNIFICANT ACHIEVEMENTS (continued)

Media (continued)

The Society was represented at 25 TV and radio interviews on topics including space exploration and events in the night sky. We also supported journalists in providing quotes for articles, finding UK experts in astronomy and geophysicists from our database, and sourcing appropriate image content.

RAS Council agreed a new social media policy in 2017. Twitter is at this point the most valuable social media tool for the Society, both in promoting our work and in direct conversations with the communities we represent and the wider public. Many of our announcements that have little exposure in conventional media do well in social media channels.

The social media channels in use are primarily Twitter (nearly 25,000 followers) and Facebook (nearly 9,000 members in the RAS group), with a smaller and less active LinkedIn discussion group (2300 members). Two Twitter accounts cover the RAS Library and our outreach work.

A number of staff promote the Society through individual Twitter accounts, where they can hold more extended discussions.

Political engagement

In 2017 the Society continued its engagement with partner organisations and policymakers, concentrating on the prospects for astronomy and geophysics after Brexit, and the potential impact on funding for curiosity-driven research of the new Industrial Strategy.

The Society worked closely with the Campaign for Science and Engineering, and co-funded additional staff support there to address the impact of Brexit. Drawing on the advice of members of Council and the Committee on Diversity in Astronomy and Geophysics, the RAS helped shape CaSE policy papers on Brexit, diversity, and immigration.

The Society responded to consultations on the science budget and Industrial Strategy, on the call for ideas from the UK Space Agency and on the use of laser pointers. Through our membership of the Campaign for Science and Engineering, we co-funded a new policy officer post, and put forward the case for easy movement of scientists to and from the EU after Brexit takes effect. The Society also supported a European Astronomical Society special representative in Brussels, with the post-holder acting as an advocate for European astronomy and space science. Alongside this, the Society co-organised a session on policy and public engagement at the European Week of Astronomy and Space Science in Prague.

SIGNIFICANT ACHIEVEMENTS (continued)

Political engagement (continued)

At Westminster, the President and Deputy Executive Director met with the Shadow Science Minister, Chi Onwurah MP. The society is represented at the quarterly 'Parliamentary Affairs Committee', which brings together learned societies to meet with MPs on the Science and Technology Committee. The Society sponsored delegates at the Voice of the Future event in the House of Commons, where 'young' researchers put questions to MPs, the Science Minister and his shadow, and the Chief Scientific Advisor.

The Society had a presence at pan-science events at the regional assemblies in Scotland, Wales and Northern Ireland.

2017 saw the publication of the first results from the RAS survey of the demographics and research interests of the UK astronomy and geophysics communities, providing an update and comparison with the last survey, published in 2010. There has been an increase of 23 percent in the number staff working in astronomy, solar system science and solid earth geophysics since 2010. However, our scientists from the UK are significantly less likely to be from minority ethnic backgrounds and the disabled than the population at large.

The Society also completed a report on the wider impact of geophysics, which it distributed to elected politicians and government officials.

Consultations

In 2017 the Society gave evidence to:

- ◆ Department of Business, Enterprise, Innovation and Skills: Inquiry into the use of laser pointers
- ◆ House of Commons Science and Technology Committee: inquiry into the Science Budget and the Industrial Strategy
- ◆ Horizon 2020: options for the UK
- ◆ UK Space Agency: Call for Ideas and Evidence
- ◆ Building our Industrial Strategy: green paper

The Research Excellence Framework (REF) is undertaken by the four UK higher education funding bodies. Expert panels for each of the 34 subject-based units of assessment review the research outputs for their respective areas. The results of the review inform the selective allocation of funding for research in UK universities. The next exercise will be undertaken in 2021. In 2017 learned societies were invited to make nominations for the expert panels. The Society worked with the Institute of Physics and the Geological Society to put forward a comprehensive set of names for our relevant panels

SIGNIFICANT ACHIEVEMENTS (continued)

IT and Information Management

The Society continued its modernisation of its IT systems. This year saw the installation of Eduroam at Burlington House, allowing academics from all over the world seamless access to our wireless network.

After a competitive process, the Society appointed an external developer for the new website. Following extensive work on the structure and content of the site by both RAS staff and the company development team, it is expected to go live in the spring of 2018.

The Society made changes to its data and records management as part of its planning to ensure compliance with the new General Data Protection Regulation that will come into force in May 2018.

Publications

Our objective is to publish high quality peer reviewed journals on astronomy and geophysics.

The Society owns two primary research journals, Monthly Notices of the Royal Astronomical Society (MNRAS) and Geophysical Journal International (GJI). These journals are world-leading in respect of both size and quality. The Society's publisher is Oxford University Press. Our peer review process is overseen by an editorial team of 8 assistant editors, 24 MNRAS scientific editors and 29 GJI scientific editors

A summary of key annual data is set out below:

- ◆ The number of papers submitted to MNRAS in 2017 (4600 submissions) increased by 2 % compared with 2016.
- ◆ The number of papers submitted to GJI in 2017 (1155 submissions) increased by 11 %.
- ◆ MNRAS and GJI received 2016 Impact Factors of 4.961 and 2.414 respectively.
- ◆ There were over a million full-text downloads from GJI in 2017 (a 24.5 % increase compared with 2016); nearly 2.5 million downloads from MNRAS and MNRAS Letters (15.5 % increase for MNRAS; 24% increase for Letters) and over 165,000 downloads for the in-house magazine A&G (25 % increase).
- ◆ As in previous years a workshop on publishing in astronomy was held at the National Astronomy Meeting. This was aimed at all early-career researchers looking to publish their research or to review papers.

SIGNIFICANT ACHIEVEMENTS (continued)

Publications (continued)

There were two winners of the GJI student prize in 2017 - Lucile Bruhat and Quentin Brissaud. This prize is designed to acknowledge the best papers submitted to GJI by early career scientists in the field. The winners receive a cash prize, a framed certificate, their paper is made freely available throughout 2018 and acknowledgements are made on the journal stand at the American Geophysical Union and European Geosciences Union General Assembly meetings.

We published two special issues in MNRAS: Spacecraft at Comets from 1P/Halley to 67P/Churyumov-Gerasimenko, and Comets: A new vision after Rosetta and Philae. All papers published in these special issues are freely available online. In addition to the special issues, all Galaxy Zoo papers (the crowdsourced astronomy project) are also freely available online.

Library and Archive

The Society has a world-class collection in astronomy and geophysics.

It receives some 300 current periodicals in astronomy and geophysics and houses more than 10,000 books from popular level to conference proceedings and in addition it has a large specialist collection of astronomical rare books.

1200 visits were made to the Library in 2017, by Fellows and Friends, external researchers, people attending public lectures and other events like Open House, and groups of school and university students. Around 700 enquiries from researchers around the world were received via email, phone, post and social media.

The Society delivered an innovative programme for visiting primary school children, and this year the Librarian and Education, Outreach and Diversity (EOD) Officer delivered a presentation on how to use astronomical archives in school outreach activities during a conference for library, archive and museum professionals (Discovering Communities, Discovering Collections, 28-30 November 2017). The EOD Officer and Librarian have also worked with the Objectivity YouTube channel to provide a series of 6 videos about items in the RAS collections, each video averaging about 24,000 views. The RAS archives were the subject of a paper at the inaugural Science and Technology Archives conference at the Science Museum.

The RAS library team also worked with the events team and other Courtyard Societies to run another successful Burlington House "Courtyard Late", this time focusing on the theme of colour, displaying library materials on spectroscopy, and featuring talks by Jen Gupta on rainbow astronomy.

SIGNIFICANT ACHIEVEMENTS (continued)

Library and Archive (continued)

The sextant thought to have belonged to Captain Cook has been loaned to the Whipple Museum for its exhibition 'Astronomy and Empire' (October 2nd 2017-September 28th 2018).

New acquisitions for the archive include the painting *Celestial II*, on loan to the RAS since 2007 and now kindly donated by the artist Anthony Whishaw RA, and the manuscript memoirs of Edward Ball Knobel FRAS.

Thanks to the Patron's Gift of £2,000, and the David Dewhirst fund, it has been possible to conserve the Joseph Middleton manuscript, which forms the nucleus of the Spitalfields Mathematical Society collection. Sophie Coles, a conservation student at Camberwell College, has conserved the mould-damaged planetary drawings of Warren De La Rue.

Progress in collection management includes the rehousing of large format photographic glass plates by astrophotographers like Warren De La Rue. 900 plates and lantern slides have now been catalogued and rehoused.

Scientific meetings

Scientific meetings are at the heart of the Society's activities. A monthly programme of meetings (excluding the Summer break between June and September) was held in Burlington House, comprising parallel Specialist Discussion meetings (covering topics in astrophysics, solid-earth geophysics, solar-terrestrial physics, and planetary sciences), followed by the A&G ('Ordinary') meeting, with a broader programme of more general interest open to the public. Meeting reports were published, with financial assistance from the RAS, by 'The Observatory' journal.

Typically audiences for the Specialist Discussion meetings exceeded 50 and for the A&G ('Ordinary') meeting 100.

Details of Specialist Discussion meetings and A&G ('Ordinary') meetings were held in 2017 are included as an Appendix to this Annual Report.

SIGNIFICANT ACHIEVEMENTS (continued)

Support to professional astronomers and geophysicists and students

The Society awarded two Research Fellowships, and the applications received for the two extremely highly sought-after positions were of very high calibre. The Society has supported 18 Fellowships since it began to offer them in 2010. In addition, the Society made 196 awards totalling £568,260 to support travel, research and educational projects.

A full list of 2017 grantees is on the RAS website and summary grant information is disclosed in the accounts section below.

The Society continued its childcare grant to assist carers to attend the National Astronomy Meeting (NAM), held in Hull in 2017; four individuals applied for and received a grant.

External meetings

The Society continued to host the Astronomy Forum, Solid-Earth Geophysics Forum and External Geophysics Forum; these are informal bodies that bring together senior academics and policymakers.

National Astronomy Meeting

The National Astronomy (NAM) meeting was held in Hull in 2017. The Society arranged the conference with the University of Hull, with delegate accommodation provided on the campus. Academics at the University undertook the tasks of the Local Organising Committee (LOC) and coordinated the Scientific Organising Committee (SOC). The Society also worked with the Hull academic team to build the conference website, and online registration and abstract submission systems.

There were 470 paid registrants, plus 50 non-paid participants (RAS staff, media, prize winners, industry). 330 members of the public attended the public talk and over 200 school children took part in the outreach programme.

International

The Society continued to support the International Astronomical Union (IAU) Office for Astronomy Development (OAD). The Society funded grants for the OAD visiting experts scheme, where astronomers and geophysicists share expertise internationally.

Public lectures and talks given at A&G ('Ordinary') meetings (held in the Geological Society Lecture Theatre) continue to be recorded - lectures are available online via the RAS YouTube channel and the website. This serves as a benefit to the community based overseas who are unable to attend meetings in person and also to interested members of the public.

SIGNIFICANT ACHIEVEMENTS (continued)

Awards and Medals

The Society's awards and medals continued to be highly valued by their recipients and the community, representing, as they do, the recognition by their peers of outstanding achievement. The recipients of the 2017 medals and awards, selected in 2016, are listed in an appendix to this Annual Report.

The Fellowship

The RAS comprises some 4,189 Fellows and Honorary Fellows, of whom approximately one quarter are based in some 61 overseas countries; 21% are under the age of 34 and 29% are over 65; approximately 18% of the total membership is female (of which 38% are under 34, 47% are aged 34 to 65 and 12% are over 65, 3% have not declared their age).

Friends of the RAS

The Friends of the RAS scheme allows members of the public with an interest in astronomy or geophysics to support the Society's work, and to have opportunities through the Society to find out more about these sciences. The scheme was started in January 2009 to coincide with the International Year of Astronomy; building on the success of the Society's Public Lectures launched the previous year.

There were approximately 213 Friends of the RAS during 2017. Marcus Hope, the volunteer leader of the Friends programme, provided an impressive programme of lectures; topics included The Stories of Apollo: A Private Collection of Rare Artefacts from the NASA Missions to the Moon, Planets and Pulsations: The New Keplerian Revolution, Interstellar flight: the benefit to Astrophysics, Cosmic Sublime: the art and science of astronomy, Cosmology with KiDS, The James Webb Space Telescope; and a sunset/moon rise visit to Stonehenge.

RISKS

The principal risks and uncertainties identified by the trustees are:

- ◆ Maintenance of the quality of, and income from, publications (a significant income stream of above 60%)
- ◆ Open Access Publishing
- ◆ Affordability of rent and service charges for the premises at Burlington House

The Finance Committee regularly reviews the Society's risk register and the Council annually reviews the major risks to which the Society is exposed and systems that have been established to manage those risks. In regards to the three most significant risks:

RISKS (continued)

The Society insists that rigorous peer review is used to maintain the quality of the two journals and thereby the demand by authors and readers for the highly successful publications, and with the publishers ensures that it adopts a robust business model for production and sales.

The uncertainty over future rental charges remains an ongoing concern for the Society. The Society, alongside the other Courtyard Societies, continues to seek a satisfactory resolution with the landlord. The trustees still hold the view previously stated (Annual Report 2015) that the Society has the resources to cover increases in rental charges over the current lease period. In the meantime, the Society will explore options for alternative accommodation if a satisfactory resolution cannot be achieved.

Other key risks identified and their mitigation measures include:

- ◆ Maintenance of the (listed) premises (by regular repair and refurbishment).
- ◆ Maintenance of the size of the membership (by regular review of services and subscriptions and outreach activities to potential new members).
- ◆ The implementation of a broad range of statutory regulation, for example GDPR (using expert external assistance where necessary).

The trustees consider the fluctuations in investment fund values and variability of investment returns to be a risk of the Society. The fund, Newton Growth and Income Fund for Charities, is actively and expertly managed and administered by Newton Investment Management. Funds are invested in a diverse portfolio comprising commodities, equities, bonds and gilts. This managed strategy mitigates fluctuations in fund values and seeks opportunities for fund growth and income. The trustees consider this approach mitigates the subsequent exposure to any investment risk.

STRUCTURE, GOVERNANCE AND MANAGEMENT

The Royal Astronomical Society was founded in 1820 and is incorporated by Royal Charter and managed according to byelaws that were revised at the Annual General Meeting in May 2015. The RAS's objectives, charters and byelaws are detailed on the society's website www.ras.org.uk.

The control of the Society rests with the General Meeting of Fellows. Subject to that, direction and management is the responsibility of the Council (that serves as the Board of Trustees). The Council consists of a President, a Treasurer and three Secretaries together with four Vice-Presidents and twelve Councillors. In addition the President-elect attends Council for one year prior to taking up post.

STRUCTURE, GOVERNANCE AND MANAGEMENT (continued)

Trustee recruitment and appointment

Annually, the full membership of the Society is asked to nominate themselves or other members of the Society to available positions on Council. A nomination must be supported by two other members of the Society. Council approves the ballot list and this together with a narrative on each candidate is sent to the full membership for their consideration prior to casting their votes. Voting can be done electronically, by post or in person at the Annual General Meeting.

Members of the Council are elected by ballot at the Annual General Meeting, for the following normal and maximum terms of office, as set out in the byelaws. In summary:

- ◆ President, two years
- ◆ Vice-Presidents, two years
- ◆ Treasurer and Secretaries, five years
- ◆ Councillors, three years.

Trustee induction

New members of Council attend a Trustee Induction programme before their first Council meeting. All members of Council are asked to complete a conflict of interest declaration and to sign a Trustee declaration form.

Organisational structure

The RAS Council normally meets 6 times during the year and its function is to direct, on behalf of the Society, all the affairs and business of the Society. Council appoints standing committees (Publications Management, Editorial (for each journal), Outreach and Education, Finance, International, Membership, Library, Astronomical Heritage, Committee for Diversity in Astronomy and Geophysics) and ad hoc committees (e.g. Awards) to forward its objectives.

It appoints the managing editors and editors of the Society's research journals, Monthly Notices of the Royal Astronomical Society and Geophysical Journal International who provide their services, as does the Treasurer, for an honorarium.

The Society has formal associations with a number of organisations having shared interests, and has less formal arrangements with several other bodies. These include:

- ◆ The British Geophysical Association, jointly sponsored by the RAS and the Geological Society of London to represent Solid Earth Geophysicists whose interests fall within the remits of both parent societies.
- ◆ The Paneth Meteorite Fund that the Society administers under the direction of the Paneth Fund trustees.

STRUCTURE, GOVERNANCE AND MANAGEMENT (continued)

Organisational structure (continued)

- ◆ The Society is the UK national member organisation of the International Astronomical Union and the European Astronomical Society and is represented on the UK Panel of the International Union of Radio Science.
- ◆ The Society is represented on a number of organisations including the Science Council, the Parliamentary and Scientific Committee and the Campaign for Science and Technology.
- ◆ The Society recognises the appeal of astronomy and geophysics to the general public by offering annual membership to Friends of the RAS for a small fee. Friends' benefits include a series of Friends' only lectures, as well as priority seating for the Society's popular public lectures, visits to observatories and science centres, use of the Society's Library, as well as a reduced subscription to the Society's 'house journal' Astronomy & Geophysics.

EVENTS SINCE THE YEAR END

Recognition in New Year's Honours list

We were delighted that two of our Fellows, space scientist Professor Michele Dougherty, and geophysicist Professor Kathy Whaler were recognised in the New Year's Honours list for 2018. Michele Dougherty is Professor of Space Physics at Imperial College London, and received the Commander of the Order of the British Empire (CBE) for services to UK physical science research. Kathy Whaler is Professor of Geophysics at the University of Edinburgh, and was President of the RAS from 2004 to 2006. She was made an Officer of the Order of the British Empire (OBE) for services to geophysics.

RAS200 projects

Most of the RAS200 projects are now underway, and there were successful launch events for The Planets 360 and Cornwall - Sea to Stars in February and March 2018 respectively. Further events involving RAS200 projects planned for this year include the Urdd National Eisteddfod and Youth Eisteddfod in Wales, and an active programme from Girlguiding including the launch of an Astronomy badge.

EVENTS SINCE THE YEAR END (continued)

EWASS media coverage

NAM/EWASS 2018 was a highly successful year for the press office. A highlight was an appearance on the 6pm BBC News for a project using infra-red imaging methods from astronomy to monitor wildlife for conservation. Several other stories appeared in international news outlets, and ESA TV were filming and broadcasting from the conference for 2 days. In a new venture, the RAS media team also conducted and filmed several 'media briefings' on several large projects such as SKA and ARIEL, which were live-streamed on social media and received very positive feedback.

New RAS website

The RAS website has been undergoing a significant revamp, and a new site will be released to the public in the next few months. All sections have been revised, with a view to modernising the image of the RAS, and making the website much more usable and useful to our target audiences. A program of initial testing has already been carried out, with very positive feedback on the new look and feel, and the updated content and improved functionality should be a significant asset to the Society in the future.

A&G Magazine

The Editor, with the President held an RAS Reception at the 231st Meeting of the American Astronomical Society in January 2018, with the support of our publishing partner Oxford University Press. RAS Fellows based in the USA enjoyed the opportunity to talk and share their opinions about the Society's activities.

We had an excellent response to the A&G Readers' Survey. The survey showed that most respondents considered A&G an important benefit of Fellowship, most preferred to read it in print and that the mixture of articles satisfied most readers.

PLANS FOR THE FUTURE

Continuing objectives

The Society will:

- ◆ continue to publish high quality peer reviewed journals on Astronomy and Geophysics,
- ◆ sustain its support of students and early career scientists by continuing to provide research fellowships and grants,
- ◆ continue to recognise achievements in Astronomy and Geophysics by the awards of medals and prizes,

PLANS FOR THE FUTURE (continued)

Continuing objectives (continued)

- ◆ maintain a high quality programme of specialist discussion meetings and public lecture series,
- ◆ continue to support the 'Friends of the RAS' programme,
- ◆ host a National Astronomy meeting in Lancaster in 2019,
- ◆ continue to monitor the impact of Brexit and ensure that Government and other agencies are aware of the requirement for sustained and significant public funding of astronomy and geophysics research,
- ◆ maintain a programme of education and outreach activity in order to engage with diverse audiences,
- ◆ continue to provide a library and archive service, and
- ◆ continue to work with the other Courtyard Societies to promote Burlington House as a significant cultural hub, pursue the matter of the lease and explore other accommodation options if necessary.

Specific objectives for 2018

The Society will:

- ◆ conduct a strategic review of all the Society's programme of activities to inform its balance and future direction,
- ◆ carry out an attitudinal survey of the Fellowship in order to inform the above review,
- ◆ produce a detailed plan of activity to mark the Society's bicentenary in 2020,
- ◆ launch the new website,
- ◆ carry out a benchmarking exercise of staff salaries to ensure the appropriate level of remuneration, and
- ◆ improve access to the Society's collections using the new website.

FINANCIAL REVIEW

The Society's total funds increased from £19,863,597 to £20,620,630 during the year, both figures including a large contribution from the Society's heritage assets (rare books, clocks, telescopes and fine art) which totalled £9,440,879 (2016: £9,440,879). Income decreased to £4,182,673 (2016: £4,299,415) due to reduced income from the National Astronomy Meeting as the University of Hull directly administered and received the delegate fees. Publishing income, due in part to a reduction in late submission penalty payments, reduced by £103,803. The Society's expenditure decreased from £4,239,986 to £4,118,212 which is mainly due to research supported by fellowship grants ending earlier than anticipated, reduced direct costs of the National Astronomy Meeting as the University of Hull directly incurred the majority of the direct costs, and the timing of expenditure for RAS200 tranche 2. Net investment gains totalled £692,572 (2016: £663,862).

Policy on reserves

The reserves policy aims to maintain adequate financial cover for the main risks to the Society and provide in the normal way for an efficient winding-up if that ever became necessary. Working cash reserves are maintained so the Society does not rely on realisation of investments gains, or capital invested. The total funds are now £20,620,630 of which £9,440,879 are held in heritage assets, leaving funds of £11,179,751 to cover the main risks and the operational needs of a going concern.

The requirement for significant reserves falls into two areas:

- ◆ The need to have contingency plans in place to maintain publication income if Open Access regulations threaten the current business model for academic journals; and
- ◆ The need to make some provision for either substantial increases in rent, or alternatively, a change in the status of our accommodation. This has come under closer review during the year when the Society and four other Courtyard Societies completed arbitration proceedings with the landlord. The Society's right to remain at Burlington House under the present lease is not in doubt, but the scale of future rent increases is as yet undetermined.

The Open Access Fund and the Burlington House Fund are currently maintained at high levels to support any significant changes to the Society's operations and the General Fund is available to provide further financial support if either of these risks materialise. The General Fund is also available, should it ever be needed, to enable an orderly winding up of the Society. At present the free reserves of the Society, defined as unrestricted, undesignated funds, excluding tangible fixed assets, are £5,829,931 and these would allow operation of the Society for at least 16 months if publishing were continued and expenditure incurred during that period and 41 months if publishing were halted. The trustees are satisfied that the current level of reserves is appropriate given the risks and uncertainties outlined above.

FINANCIAL REVIEW (continued)

Policy on reserves (continued)

It has been the policy of the Society to fund grant activity from the Research and Grants fund, which is now included in the balance of designated reserves.

Investment policy

The trustees, by resolution, adopted a total returns approach to the invested endowment funds in accordance with the requirements of the Charity Commission believing that this approach is in the best interests of the Society. The fund reconciliation is disclosed in note 12. This approach was applied from 1 January 2015 when the value of the endowment funds at that date of £1,652,682 was used as a proxy for the original value of the endowment funds. In adopting this policy permanent endowment funds will not be permitted to fall below the original value of £1,652,682. The Trustees aim to maintain the real value of the permanent endowment as a measure against the movements in the retail prices index. This was 4.1% for the year. The balance of £178,295 (2016: £239,155) was transferred to the restricted funds for current and future expenditure.

The Society has made no changes to its investment policy, with the funds now invested with BNY Mellon in a Growth and Income Fund managed by Newton Investment Management. The Society's Investment Policy has been agreed by Council. Funds will be invested in stable, legally constituted bodies chosen to maximise the Society's investment income in the medium and long term.

Grant making policy

The RAS has for many years provided small grants to support the community in activities not funded by the research councils. Primarily these have been awarded to help students at the start of their careers, either with funding for summer bursaries enabling them to experience working in a research environment while still an undergraduate, or to enable PhD students to present work at research conferences. The RAS has also supported scientific meetings in the UK, especially those held outside London. These broad categories of support have been discussed many times at Council and serve the purpose of encouraging entrants to the profession and extending the activities of the Society to members and the public outside London.

In addition to these grants to individuals the Society funds a series of fellowships to promote the careers of the highest quality young postdoctoral scientists. These currently include RAS Fellowships (on any subject) the Norman Lockyer Fellowship (in Solar and Solar Terrestrial Physics) and Daphne Jackson Fellowships enabling scientists to return to work after career breaks. Of these fellowships the Norman Lockyer Fellow is funded from an endowment fund set up for that purpose.

FINANCIAL REVIEW (continued)

Grant making policy (continued)

The Society awarded a further six grants in the second and final tranche of funding for its RAS200 outreach projects in collaboration with partner organisations and made an additional award to a grantee from the first tranche of funding.

A further activity funded by the Society is the award of medals to recognise the highest quality work in various categories. These awards are proposed to Council by a separate awards panel and no awards are made to serving councillors.

The grants, fellowships and awards are funded from two sources. The Society has its restricted and endowment funds invested with Newton Investment Management and the income and gains from these investments are used to support the grants expenditure in accordance with the bequests.

The grants panel deliberates twice a year and further grants are awarded by the Education and Outreach Committee. It comprises the Treasurer (Chair) and the three secretaries. About 160 applications are received for the two deadlines in February and in August. Panel members observe strict rules on conflict of interest, taking no part in decisions on grant applications from their home institutions. In addition it is usual for panel members to absent themselves from discussions on grant applications from scientists with whom they have had recent close contact, such as research students supervised in the past five years.

Key management personnel

The key management personnel of the charity in charge of directing and controlling, running and operating the charity are the Trustees, the Executive Director and the Deputy Executive Director; the latter two are employees. They are assisted by a senior accountant, accountant, a further three managerial level officers and other staff.

On behalf of the RAS Council, the Treasurer carries out a salary comparison exercise every 3-5 years. The comparability study compares the staff salaries to other similar external positions to reassure the Trustees that the levels of remuneration are appropriate. The last comparison exercise was carried out in 2013.

In 2013 the analysis included consideration of the job function, complexity and location. For the majority of posts the current salary was well aligned with those of similar posts based in London. The salaries of the key management staff members were compared with those of similar appointees in other Learned Societies, consideration given to the size of the organisation (financial turnover) and the number of staff employed and salary levels set to ensure that the remuneration was appropriate for the level of managerial responsibility held.

The Society does not have a performance related pay scheme. The Trustees annually consider a salary increase in regards to cost of living that applies to all staff.

FINANCIAL REVIEW (continued)

Pension scheme

The Society's defined benefit pension surplus and its accounting treatment is explained in note 20 of these financial statements. This scheme is closed to new members and has four deferred members only and 11 annuitants. The Society operates a defined contribution group personal pension scheme.

Legacies and donations

The Society encourages Fellows to include donations to the Society in their wills and receives sporadic donations during the year from Fellows and members of the public. During the year the Society received donations of £3,976 (2016 - £3,239) and legacies totalling £33,021 (2016 - none).

Heritage assets

The Society's collection of rare books, fine art, telescopes and clocks was valued in 2011 at approximately £9.5 million. The Society does not regard these as assets which can be converted to their cash value, except in the most dire circumstances.

The Society continues to periodically receive donated items. All such donations are gratefully received and appreciated by the Society. The Society would only obtain a valuation of the donation, if it was deemed to materially affect the overall value of the heritage asset portfolio.

Investment performance

The Newton Growth and Income fund for charities provided income of 2.8% and net gains of 9.8% in the year. Performance of the fund managers is kept under continual review. The fund continues to remain in the top three best performing funds in its class as reported by Asset Risk Consultants.

TRUSTEES' RESPONSIBILITIES IN THE PREPARATION OF ACCOUNTS

The trustees are responsible for preparing the Trustees' report and the accounts in accordance with applicable law and United Kingdom Accounting Standards (United Kingdom Generally Accepted Accounting Practice).

The law applicable to charities in England and Wales requires the trustees to prepare accounts for each financial year which give a true and fair view of the state of affairs of the charity and of the income and expenditure of the charity for that period. In preparing these accounts, the trustees are required to:

- ◆ select suitable accounting policies and then apply them consistently;
- ◆ observe the methods and principles in Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102);
- ◆ make judgments and estimates that are reasonable and prudent;
- ◆ state whether applicable United Kingdom Accounting Standards have been followed, subject to any material departures disclosed and explained in the accounts;
- ◆ prepare the accounts on the going concern basis unless it is inappropriate to presume that the charity will continue in operation.

The trustees are responsible for keeping proper accounting records that disclose with reasonable accuracy at any time the financial position of the charity and enable them to ensure that the accounts comply with the Charities Act 2011 and the provisions of the Royal Charter and Bye Laws. They are also responsible for safeguarding the assets of the charity and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities. The trustees are responsible for the maintenance and integrity of the charity and financial information included on the charity's website.

The Council of the Society believes that it has carried out these requirements.

AUDITORS

A resolution to appoint Buzzacott for 2018 will be proposed at the Annual General Meeting.

Approved by the Council and signed on its behalf by:

Professor John Zarnecki
President

Date: 11 May 2018

Independent auditor's report to the trustees of Royal Astronomical Society

Opinion

We have audited the accounts of Royal Astronomical Society (the 'charity') for the year ended 31 December 2017 which comprise the statement of financial activities, the balance sheet, the statement of cash flows, the principal accounting policies and the notes to the accounts. The financial reporting framework that has been applied in their preparation is applicable law and United Kingdom Accounting Standards, including Financial Reporting Standard 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' (United Kingdom Generally Accepted Accounting Practice).

This report is made solely to the charity's trustees, as a body, in accordance with section 144 of the Charities Act 2011 and with 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.

In our opinion, the accounts:

- ◆ give a true and fair view of the state of the charity's affairs as at 31 December 2017 and of its income and expenditure 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.

Basis for opinion

We conducted our audit in accordance with International Standards on Auditing (UK) (ISAs (UK)) and applicable law. Our responsibilities under those standards are further described in the auditor's responsibilities for the audit of the accounts section of our report. We are independent of the charity in accordance with the ethical requirements that are relevant to our audit of the accounts in the UK, including the FRC's Ethical Standard, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Conclusions relating to going concern

We have nothing to report in respect of the following matters in relation to which the ISAs (UK) require us to report to you where:

- ◆ the trustees' use of the going concern basis of accounting in the preparation of the accounts is not appropriate; or
- ◆ the trustees have not disclosed in the accounts any identified material uncertainties that may cast significant doubt about the charity's ability to continue to adopt the going concern basis of accounting for a period of at least twelve months from the date when the accounts are authorised for issue.

Other information

The trustees are responsible for the other information. The other information comprises the information included in the annual report and accounts other than the accounts and our auditor's report thereon. Our opinion on the accounts does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the accounts, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the accounts or our knowledge obtained in the audit or otherwise appears to be materially misstated. If we identify such material inconsistencies or apparent material misstatements, we are required to determine whether there is a material misstatement in the accounts or a material misstatement of the other information. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact.

We have nothing to report in this regard.

Matters on which we are required to report by exception

We have nothing to report in respect of the following matters in relation to which 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 accounts; or
- ◆ sufficient accounting records have not been kept; or
- ◆ the accounts 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.

Responsibilities of trustees

As explained more fully in the trustees' responsibilities statement, the trustees are responsible for the preparation of the accounts and for being satisfied that they give a true and fair view, and for such internal control as the trustees determine is necessary to enable the preparation of accounts that are free from material misstatement, whether due to fraud or error.

In preparing the accounts, the trustees are responsible for assessing the charity's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the trustees either intend to liquidate the charity or to cease operations, or have no realistic alternative but to do so.

Auditor's responsibilities for the audit of the accounts

Our objectives are to obtain reasonable assurance about whether the accounts as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs (UK) will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these accounts.

A further description of our responsibilities for the audit of the accounts is located on the Financial Reporting Council's website at www.frc.org.uk/auditorsresponsibilities. This description forms part of our auditor's report.

Buzzacott LLP
Statutory Auditor
130 Wood Street
London
EC2V 6DL

[Date]

Buzzacott LLP is eligible to act as an auditor in terms of section 1212 of the Companies Act 2006

	Notes	Unrestricted funds £	Restricted funds £	Endowment funds £	2017 Total funds £	2016 Total funds £
Income						
Donations and legacies	1	10,366	26,631	—	36,997	3,239
Other trading activities		40,106	—	—	40,106	44,948
Investment income	2	144,331	5,222	56,037	205,590	207,919
Charitable activities	3	3,899,980	—	—	3,899,980	4,043,309
Total income		4,094,783	31,853	56,037	4,182,673	4,299,415
Expenditure						
Raising funds		15,130	—	—	15,130	20,687
Charitable activities	5	4,042,641	60,441	—	4,103,082	4,219,299
Total expenditure		4,057,771	60,441	—	4,118,212	4,239,986
Net income (expenditure) before investment gains and losses						
		37,012	(28,588)	56,037	64,461	59,429
Net gains on investments	12	484,800	17,754	190,018	692,572	663,862
Net income (expenditure)		521,812	(10,834)	246,055	757,033	723,291
Gross transfer between funds	15	—	178,295	(178,295)	—	—
Net movement in funds		521,812	167,461	67,760	757,033	723,291
Reconciliation of funds:						
Total funds brought forward at 1 January 2017		17,721,108	489,807	1,652,682	19,863,597	19,140,306
Total funds carried forward at 31 December 2017		18,242,920	657,268	1,720,442	20,620,630	19,863,597

All income from other trading activities and expenditure on raising funds is unrestricted in the above financial years.

All gains and losses for the year are recognised in the above statement. All activities are classed as continuing.

The notes on pages 36 to 51 form part of these accounts.

Balance sheet 31 December 2017

DRAFT

	Notes	2017 £	2017 £	2016 £	2016 £
Fixed assets					
Tangible assets					
. Heritage assets	11	9,440,879		9,440,879	
. Other assets	11	1,031,930		1,114,508	
Investments	12	7,724,936		7,032,364	
			18,197,745		17,587,751
Current assets					
Debtors	13	541,171		588,727	
Cash at bank and in hand		4,133,361		3,753,225	
		4,674,532		4,341,952	
Creditors: amounts falling due within one year	14	(2,041,318)		(1,755,269)	
Net current assets			2,633,214		2,586,683
Total assets less current liabilities					
			20,830,959		20,174,434
Creditors: amounts falling due after one year	14		(210,329)		(310,837)
Total net assets			20,620,630		19,863,597
The funds of the charity					
Endowment funds	15	1,720,442		1,652,682	
Restricted income funds	16	657,268		489,807	
Unrestricted income funds					
. Designated funds	17	12,412,989		12,643,116	
. General funds		5,829,931		5,077,992	
			18,242,920		17,721,108
			20,620,630		19,863,597

The accounts were approved by Council on 11 May 2018 and signed on its behalf by

Professor John Zarnecki
President

The notes on pages 36 to 51 form part of these accounts

Statement of cash flows Year to 31 December 2017

DRAFT

	Notes	2017 £	2016 £
Cash inflow from operating activities			
Net cash provided by operating activities	A	205,904	85,865
Cash inflow from investing activities			
Dividends and interest from investments		205,590	207,919
Purchase of tangible fixed assets		(31,358)	(5,336)
Net cash provided by investing activities		174,232	202,583
Change in cash and cash equivalents in the year		380,136	288,448
Cash and cash equivalents at 1 January 2017	B	3,753,225	3,464,777
Cash and cash equivalents at 31 December 2017	B	4,133,361	3,753,225

Notes to the statement of cash flows for the year to 31 December 2017.

A Reconciliation of net movement in funds to net cash flow from operating activities

	2017 £	2016 £
Net movement in funds (as per the statement of financial activities)	757,033	723,291
Adjustments for:		
Depreciation charge	112,515	116,863
Net gains on investments	(692,572)	(663,862)
Dividends and interest from investments	(205,590)	(207,919)
Loss on disposal of fixed assets	1,421	—
Decrease in debtors	47,556	54,300
Increase in creditors	185,541	63,192
Net cash provided by operating activities	205,904	85,865

B Analysis of cash and cash equivalents

	2017 £	2016 £
Total cash and cash equivalents: Cash at bank and in hand	4,133,361	3,753,225

The principal accounting policies adopted, judgements and key sources of estimation uncertainty in the preparation of the accounts are laid out below.

Basis of preparation

These accounts have been prepared for the year to 31 December 2017.

The accounts have been prepared under the historical cost convention with items recognised at cost or transaction value unless otherwise stated in the relevant accounting policies below or the notes to these accounts.

The accounts have been prepared in accordance with Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (Charities SORP) the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) and the Charities Act 2011.

The charity constitutes a public benefit entity as defined by FRS 102.

The accounts are presented in sterling and are rounded to the nearest pound.

Critical accounting estimates and areas of judgement

Preparation of the accounts requires the trustees and management to make significant judgements and estimates.

The items in the accounts where these judgements and estimates have been made include:

- ◆ estimating the liability for multi-year grant commitments;
- ◆ estimating the useful economic life of tangible fixed assets; and
- ◆ estimating the accrual for Burlington House rent.

Assessment of going concern

The trustees have assessed whether the use of the going concern assumption is appropriate in preparing these accounts. The trustees have made this assessment in respect to a period of one year from the date of approval of these accounts.

The Trustees are fully cognisant of the risks that the Society is carrying such as the uncertainty and risks of increased rental charges for the accommodation in Burlington House, the possible risk posed by Open Access and a possible impact on the business model that relies on the publishing income and also of a low probability, albeit high impact risk, that the quality and success of the Society's publications will decrease.

Assessment of going concern (continued)

Whilst recognising these risks the trustees are content that the Society has strategies in place to manage them and are of the opinion that the Society has adequate free reserves and therefore sufficient resources to meet its liabilities as they fall due. The Reserves Policy on page 19 of the Trustees' report provides more detail.

The trustees have concluded that there are no other material uncertainties related to events or conditions that may cast significant doubt on the ability of the charity to continue as a going concern.

The most significant areas of judgement that affect items in the accounts are mentioned above and detail provided in the section on risks in the Trustees' report.

With regard to the next accounting period, the year ending 31 December 2018, the most significant areas that affect the carrying value of the assets held by the charity are expected to be the same as for 2017.

Income recognition

Income is recognised in the period in which the charity has entitlement to the income, the amount of income can be measured reliably and it is probable that the income will be received.

Income comprises donations, investment income, income from the sale of publications, membership subscriptions, and other related income.

Donations, are recognised when the charity has confirmation of both the amount and settlement date. In the event of donations pledged but not received, the amount is accrued for where the receipt is considered probable. In the event that a donation is subject to conditions that require a level of performance before the charity is entitled to the funds, the income is deferred and not recognised until either those conditions are fully met, or the fulfilment of those conditions is wholly within the control of the charity and it is probable that those conditions will be fulfilled in the reporting period.

Legacies are included in the statement of financial activities when the charity is entitled to the legacy, the executors have established that there are sufficient surplus assets in the estate to pay the legacy, and any conditions attached to the legacy are within the control of the charity.

The Society has a contract with Oxford University Press for the publication of journals, which gives a percentage of the surplus made to 31 December each year to the Society. Although payments are received net, income is recognised in the accounts on a gross basis which reflects that the Society retains the underlying long term rights. All publication income is accounted for on a receivable basis.

Income recognition (continued)

Membership subscriptions are payable in respect of a twelve month period in advance. The unearned portion of income received relating to the period after 31 December is carried forward as deferred income.

Investment income is recognised once the dividend has been declared and notification has been received of the dividend due.

Interest on funds held on deposit is included when receivable and the amount can be measured reliably by the charity; this is normally upon notification of the interest paid or payable by the bank.

Expenditure recognition

Liabilities are recognised as resources expended as soon as there is a legal or constructive obligation committing the charity to the expenditure. All expenditure is accounted for on an accruals basis and has been classified under headings that aggregate all costs related to the category.

Expenditure on charitable activities includes all costs associated with furthering the charitable purposes of the charity as described in the Trustees' Report.

Grants payable for the support of research or study in any areas of astronomy and geophysics are recognised in the accounts as soon as the obligation has been authorised by the Grants Committee, which meets twice-yearly (ca. February and August) to allocate funds, the recipient has a reasonable expectation that they will receive a grant and any condition attaching to the grant is outside the control of the Society.

The costs of raising funds consist of investment management fees and RAS diaries bought for resale.

Allocation of support and governance costs

Support costs, including governance costs, represent indirect charitable expenditure. In order to carry out the primary purposes of the charity it is necessary to provide support in the form of personnel development, financial procedures, provision of office services and equipment and a suitable working environment.

Governance costs comprise audit fees, legal advice for trustees and costs associated with constitutional and statutory requirements, e.g. cost of trustee meetings and preparing statutory accounts as well as costs associated with the strategic management of the Society

Support costs are apportioned based on the proportion of floor area occupied by, or proportion of staff time spent on, the activity.

Taxation

The Society is a registered charity and no liability to taxation arises on the results of its activities as applied for charitable purposes, with the exception of investment income, which is taxed at source.

Operating leases

Rentals under operating leases are charged to the statement of financial activities on a straight-line basis over the term of the lease.

Pension costs

The Society operates two pension schemes for employees and former employees. The assets of the schemes are held separately from those of the Society.

The Society operates a defined benefit pension scheme for former employees, who joined its service before 1 January 2002, providing benefits based upon final pensionable earnings. Royal London manages the pension scheme, with the investments now 100% held by Royal London.

The latest actuarial valuation at 31 December 2016 shows a pension surplus which is not recognised on the balance sheet as an asset because it is not available to the Society by way of reduced future contributions.

Actuarial gains and losses arising from new valuations and from updating valuations to the balance sheet date are recognised in the statement of financial activities as other recognised gains and losses.

The Society has established a second pension scheme (a defined contribution scheme) for employees who began service with the Society after 1 January 2002. The amount charged in the statement of financial activities in respect of the defined contribution pension scheme is the contributions payable in the year.

Foreign currencies

Monetary assets and liabilities denominated in foreign currencies are translated at the rate of exchange ruling at the balance sheet date. Transactions in foreign currencies are recorded at the rate ruling at the date of the transaction. All differences are taken to the statement of financial activities.

Investments

Listed investments are a form of basic financial instrument and are initially recognised at their transaction value and subsequently measured at their fair value as at the balance sheet date using the closing quoted market price.

Realised gains (or losses) on investment assets are calculated as the difference between disposal proceeds and their opening carrying value or their purchase value where the investment is acquired subsequent to the first day of the financial year. Unrealised gains and losses are calculated as the difference between the fair value at the year end and their carrying value at that date. Realised and unrealised investment gains (or losses) are combined in the statement of financial activities and are credited (or debited) in the year in which they arise.

Debtors

Debtors are recognised at their settlement amount, less any provision for non-recoverability. Prepayments are valued at the amount prepaid.

Cash at bank and in hand

Cash at bank and in hand represents such accounts and instruments that are available on demand or have a maturity of less than three months from the date of acquisition.

Creditors and provisions

Creditors and provisions are recognised when there is an obligation at the balance sheet date as a result of a past event, it is probable that a transfer of economic benefit will be required in settlement, and the amount of the settlement can be estimated reliably. Creditors and provisions are recognised at the amount the charity anticipates it will pay to settle the debt.

Fund structure

Endowment funds comprise assets which normally must be held as capital. The income arising therefrom is used to support specific activities determined in accordance with the wishes of the donor.

Restricted funds comprise monies raised for, or their use restricted to, a specific purpose, or contributions subject to donor imposed conditions

Designated funds represent monies set aside out of unrestricted funds and designated by the trustees for a specific purpose.

Unrestricted funds represent those monies which are freely available for application towards achieving any charitable purpose that falls within the Society's charitable objects.

1 Donations and legacies

	Unrestricted funds £	Restricted funds £	Endowment funds £	2017 Total funds £	2016 Total funds £
Donations	3,637	339	—	3,976	3,239
Legacies	6,729	26,292	—	33,021	—
2017 Total funds	10,366	26,631	—	36,997	3,239
2016 Total funds	2,793	446	—	3,239	

2 Income from investments

	Unrestricted funds £	Restricted funds £	Endowment funds £	2017 Total funds £	2016 Total funds £
Income from listed investments	142,918	5,220	56,031	204,169	205,833
Bank interest	1,413	2	6	1,421	2,086
2017 Total funds	144,331	5,222	56,037	205,590	207,919
2016 Total funds	146,156	5,152	56,611	207,919	

3 Income from charitable activities

	Unrestricted funds £	Restricted funds £	2017 Total funds £	2016 Total funds £
Publications (note 4)	3,536,589	—	3,536,589	3,640,392
Membership	297,968	—	297,968	242,361
Scientific meetings	47,481	—	47,481	147,035
Public policy	75	—	75	930
Library	8,117	—	8,117	5,341
Educational	9,750	—	9,750	3,250
Other	—	—	—	4,000
2017 Total funds	3,899,980	—	3,899,980	4,043,309
2016 Total funds	4,043,309	—	4,043,309	

4 Publications

	2017 £	2016 £
Income		
Monthly notices of the Royal Astronomical Society	2,569,254	2,632,520
Geophysical Journal International	877,914	923,063
Astronomy & Geophysics	83,279	77,732
Other	6,142	7,077
	3,536,589	3,640,392
Expenditure		
Monthly notices of the Royal Astronomical Society	1,989,536	1,941,639
Geophysical Journal International	610,055	589,905
Astronomy & Geophysics	140,108	141,985
Other	21,160	21,795
	2,760,859	2,695,324

5 Charitable activities

Breakdown of costs of charitable activities:

	Direct costs £	Support costs £	2017 £	Direct costs £	Support costs £	2016 £
Publications (note 4)	2,417,614	343,245	2,760,859	2,343,931	351,393	2,695,324
Scientific meetings	95,122	156,268	251,390	213,061	160,235	373,296
Membership	12,849	31,004	43,853	10,912	31,790	42,702
Educational	465,317	40,434	505,751	432,406	41,805	474,211
RAS 200	109,836	3,750	113,586	194,479	3,500	197,979
Library	84,717	243,215	327,932	86,258	249,950	336,208
Public policy	58,324	41,387	99,711	57,142	42,437	99,579
	3,243,779	859,303	4,103,082	3,338,189	881,110	4,219,299

Grants and awards, in support of research, are principally included under Educational and RAS 200 above to reflect the responsibilities for the management and administration of grants. 160 grants totalling £545,795 (2016: £648,795) were made to institutes and 36 grants totalling £22,465 (2016: £16,373) were made to individuals. Research supported by the Sir Norman Lockyer Fellowship and 2 research fellowships ended early resulting in credits to expenditure totalling £42,440 (2016: £113,972). 26 research and travel grants awarded prior to 2015 and unclaimed were written back to expenditure totalling £18,941 (2016: £nil).

Total grant making support costs were £24,750 (2016: £24,000).

A full list of all grantees and analysis can be found on the Society's website.

All expenditure on charitable activities is unrestricted except for £60,441 (2016: negative £38,303) which is restricted.

6 Support costs

Support costs analysed by function are as follows:

	2017 £	2016 £
Executive	78,298	97,541
Finance	63,949	69,827
Facilities	67,838	67,675
Membership	27,299	23,398
IT	50,110	54,647
Policy development and Press	67,191	69,217
Burlington House	121,364	109,180
Other	273,878	282,549
Governance (note 7)	109,376	107,076
	859,303	881,110

Staff time (based on a review of staff time apportionment) and floor area, are used as bases of apportioning support costs over charitable activities.

7 Governance costs

	2017 £	2016 £
Auditor's remuneration (note 8)	20,750	21,900
Trustees' and Committee costs	25,234	22,593
AGM expenses	4,962	4,445
Staff time and other expenses	58,430	58,138
	109,376	107,076

8 Net income (expenditure) for the year

This is stated after charging:

	2017 Total funds £	2016 Total funds £
Depreciation	112,515	116,863
Auditor's remuneration:		
. Charity audit	15,000	15,100
. Pension scheme audit	4,000	4,750
. Other services	1,750	2,050
Operating lease rentals		
. Office equipment	11,536	12,909

9 Staff costs and remuneration of key management personnel

	2017 £	2016 £
Wages and salaries	708,459	712,120
Social security costs	66,336	64,338
Pension costs (see note 20)		
. Stakeholder pension scheme	56,239	47,998
. Death in service contributions	4,091	1,940
	835,125	826,396

During the year no employee of the Society earned between £70,000 and £80,000 (2016 - one). One employee of the Society earned between £60,000 and £70,000 in 2017 (2016 – none). Employer contributions to the stakeholder pension scheme for employees earning over £60,000 were £6,490 (2016 – £nil).

The average number of employees was 19 (Administration 5, Outreach 1, Editorial 9, Library 1, House 2, Press & Policy 1) (2016 – 18).

The key management personnel of the charity in charge of directing and controlling, running and operating the charity on a day to day basis comprise the Trustees and the Executive and Deputy Executive Directors. The total remuneration (including taxable benefits and employer's pension and national insurance contributions) of the key management personnel for the year was £127,824 (2016 - £154,247).

10 Transactions with Trustees

The Trustees receive reimbursement for travel expenses actually incurred in attending meetings. The amount reimbursed during the year for 21 Trustees was £13,837 (2016 - £13,021).

Remuneration of £5,489 was paid to one Trustee during 2017 (2016: £5,384). By agreement with the Charity Commissioners (dated 14 June 2004, case No 299189, Sealing No 344/04) the Treasurer is paid an Honorarium of £5,300 per year, uplifted by inflation at the RPI rate and formally approved each year by Council.

10 Transactions with Trustees (continued)

Grants Made to Councillors

The following grants were made to Councillors during the year as part of the RAS grant awarding process. The recipients had no influence or part in the decisions on the award of these grants. For the most part the grant holders were not the main personal beneficiaries as the support was directly received by their students or meeting attendees. Excluding Councillors from the grants round completely is not seen as a satisfactory policy. It would strongly dissuade members from standing for election as Councillors and would be at variance with the accepted practice in Research Councils where members of grants panels are not excluded from applying. The process of grant review and award fully complies with the Nolan Principles and closely follows Government Research Council practice.

The grants were:

- ◆ Sir Norman Lockyer Memorial Trust as disclosed in note 22 (which shares the same board of Trustees as the Society)
- ◆ Paneth Meteorite Collection as disclosed in note 22. Dr Nigel Berman, Treasurer, is a Trustee and Professor Sara Russell, Councillor, is a Trustee.
- ◆ Intensity and Velocity Oscillations in the Flaring Solar Chromosphere supervised by Professor Lyndsay Fletcher, University of Glasgow, Councillor and Secretary, Bursary £1,200
- ◆ The Galactic Terrestrial Zone in a Cosmological Context, supervised by Professor Brad Gibson, University of Hull, Councillor, Bursary £1,200
- ◆ Solar Wind Influence on ULF waves in the Magnetosphere and their Impact on the Van Allen Radiation Belts, supervised by Dr Clare Watt, Councillor, University of Reading, Bursary £1,200
- ◆ Deep Space High: Galaxy Gala animation, supervised by Mr Charles Barclay, Councillor, Education & Outreach Grant £2,000
- ◆ Creativity and Curiosity: Conversations between Artists and Astronomers, supervised by Professor Martin Barstow, University of Leicester, former RAS President, Education & Outreach Grant £1,890
- ◆ Exoplanetary Primary Materials for Lesson or Extra Curricular Use, supervised by Dr Sheila Kanani, Education, Outreach and Diversity Officer, Education & Outreach Grant £4,250
- ◆ Future Science: A vision for the next 25 years, supervised by Professor Christine Peirce, Councillor, Durham University, Grant £750

10 Transactions with Trustees (continued)**Grants Made to Councillors** (continued)

- ◆ Office for Astronomy and Development (OAD) Visiting Experts, Uganda, supervised by Professor D Kurtz, University College London, Councillor, Grant £1,160
- ◆ OAD Travel Grant to Story of Space Festival, Goa, supervised by Dr Megan Argo, University College London, Councillor, £1,000
- ◆ Coabor8.2 Conference support, supervised by Professor J Wild, University of Lancaster, former Councillor, £250
- ◆ Dr Sheila Peacock, Councillor, is also a committee member of the British Geophysical Association which received funding of £4,000
- ◆ Professor M Bode, Councillor, is working with the European Astronomical Society (EAS) as a special representative in Brussels. The Society provided funding to the EAS of £4,407 to support this work.

11 Tangible fixed assets**a) Heritage assets**

	Rare books and manuscripts £	Fine art and collectibles £	Total £
At 1 January 2017 and at 31 December 2017	4,951,500	4,489,379	9,440,879

In 2015 net disposals for rare books and manuscripts (£100,000) and fine art and collectibles (£48,870) were made. There have been no other recorded movements between 2013 and 2017.

The rare book collection is preserved by storing in an air-conditioned, temperature-controlled environment; the fine art and collectibles are also continually preserved in order to maintain their values.

Certain heritage assets are on public display at exhibitions. The Society's Librarian controls access to those heritage assets which are kept at Burlington House.

11 Tangible fixed assets (continued)**b) Other assets**

	Leasehold improvements £	Plant and machinery £	Telephone, security & computer equipment £	Past Presidents' Portraits £	Total £
Cost					
At 1 January 2017	1,877,265	23,046	235,637	9,466	2,145,414
Additions	1,140	1,779	28,439	—	31,358
Disposals	—	—	(2,312)	—	(2,312)
At 31 December 2017	1,878,405	24,825	261,764	9,466	2,174,460
Depreciation					
At 1 January 2017	824,564	3,038	203,304	—	1,030,906
Charge for the year	94,104	2,349	16,062	—	112,515
Disposals	—	—	(891)	—	(891)
At 31 December 2017	918,668	5,387	218,475	—	1,142,530
Net book values					
At 31 December 2017	959,737	19,438	43,289	9,466	1,031,930
At 31 December 2016	1,052,701	20,008	32,333	9,466	1,114,508

12 Investments

	2017 Total funds £	2016 Total funds £
Market value at 1 January 2017	7,032,364	6,368,502
Net unrealised investment gains	692,572	663,862
Market value at 31 December 2017	7,724,936	7,032,364
Historical cost as at 31 December 2017	4,917,081	4,917,081

Investments comprise BNY Mellon: Global Growth and Income Fund.

The permanent endowment fund investments and movements in the unapplied total return are set out below.

12 Investments (continued)

	Trust for investment £	Unapplied total return £	Total endowment £
At 1 January 2017	1,652,682	—	1,652,682
Add: Total return			
. Investment income		56,037	56,037
. Investment gains on listed investments		190,018	190,018
		<u>246,055</u>	246,055
Less:			
. Allocation to income in the year		(178,295)	(178,295)
At 31 December 2017	<u>1,652,682</u>	<u>67,760</u>	1,720,442

When adopting total applied return with effect from 1 January 2015, in the absence of reliable records of the original donations, the trustees considered that the market values of the investments as recorded as at 1 January 2015 were appropriate to be considered as the initial value of the trust for investment. Since that figure sets the baseline below which disposals may not be made, taking a higher value than the actual original donations was considered to be prudent.

The trustees have resolved that they wish to maintain the real value of the permanent endowment using the retail price index as a measure. Therefore the amount retained as unapplied total return for the year was 4.1%. The balance was transferred to the restricted funds.

13 Debtors

	2017 £	2016 £
Trade debtors	45,892	23,077
Prepayments and accrued income	489,417	560,072
Other debtors	5,862	5,578
	<u>541,171</u>	<u>588,727</u>

14 Creditors**a) Amounts falling due within one year**

	2017 £	2016 £
Trade creditors	40,372	40,985
Accruals	232,436	137,338
Grants payable	520,423	445,547
Tax and social security	202,236	186,671
Deferred income	1,019,288	912,382
Other creditors	26,563	32,346
	2,041,318	1,755,269

b) Amounts falling due after more than one year

	2017 £	2016 £
Grants payable	210,329	310,837

c) Deferred income

	2017 £	2016 £
Balance as at 1 January 2017	912,382	930,009
Released to income	(912,382)	(930,009)
Income received from Fellows in advance	69,288	32,382
Publications income received in advance	950,000	880,000
Balance as at 31 December 2017	1,019,288	912,382

15 Endowment funds

	1 January 2017 £	Income £	Investment gains £	Transfers £	31 December 2017 £
Research and Grants funds:					
. Sir Norman Lockyer fund	1,277,845	43,328	146,921	(137,857)	1,330,237
. Other funds	128,218	4,347	14,742	(13,832)	133,475
	1,406,063	47,675	161,663	(151,689)	1,463,712
Benevolent fund	80,473	2,729	9,252	(8,682)	83,772
Library fund	38,226	1,296	4,395	(4,124)	39,793
Lectures and awards fund	127,920	4,337	14,708	(13,800)	133,165
	1,652,682	56,037	190,018	(178,295)	1,720,442

The transfer of £178,295 from the endowment fund to the restricted income was the extraction of investment income from the total return on fixed asset investments.

16 Restricted income funds

	1 January 2017 £	Income £	Expenditure £	Investment gains £	Transfers £	31 December 2017 £
Research & Grants fund	346,461	28,637	(53,241)	7,999	151,689	481,545
Benevolent fund	15,685	—	(440)	—	8,682	23,927
Library fund	26,686	547	(3,500)	1,855	4,124	29,712
Education fund	81,901	2,669	(1,150)	7,900	—	91,320
Lectures and awards fund	19,074	—	(2,110)	—	13,800	30,764
	<u>489,807</u>	<u>31,853</u>	<u>(60,441)</u>	<u>17,754</u>	<u>178,295</u>	<u>657,268</u>

The Restricted Funds are consolidated into five groups to serve the Council's priorities and address modern needs: Research & Grants, Benevolent, Library, Education and Lectures & Awards.

A detailed fund summary can be found on the RAS website.

The restricted funds were classified to either Restricted (R), Endowment (E), Designated (D), or General (G) funds as indicated below:

Research & Grants fund

E AG Stillhamer Trust Fund (1937)
D EW Brown Trust Fund (1939)
E Plummer Bequest (1946)
G General
R Victor Nadarov Fund (1950)
E Sir Norman Lockyer Memorial Trust (1990)
R Hosie Bequest (2000)
D Mrs. J.M Jelley-Freeman Bequest (2000)
D CAG Bearpark Trust (2000)
R Patricia Tomkins Fund (2011)
G Special Purposes Fund
E E A Milne Travel Fund (2013)
R R Potter Research Fund (2017)

Benevolent fund

E Lee & Jansen Trust Fund (1834/1879)
E Gerald Merton Fund (1986)
G Donald R. Barber Fund (2001)

Library fund

E Turnor Fund and Horrocks Memorial Fund (1853/1876)
E Harry Watson Memorial Fund (1923)
E Warin Bushell Fund (1964)
E Gaythorp Bequest (1969)
E Ian Ridpath Conservation Fund (2006)
R Dewhurst Fund (2013)

Education fund

R Newbigen Fund (1990)
R Michael Penston Memorial Fund (1991)
R Sir William Hunter McCrea Memorial Fund (2000)
R Paul Ruffle Memorial Fund (2014)
G Education Committee

Lectures & Awards fund

E Hannah Jackson-Gwilt Trust Fund (1861/1893)
E George Darwin Lectureship Fund (1926)
E George Darwin Support Fund
D AS Eddington Commemoration Fund (1948)
E Harold Jeffreys Lectureship Fund (1962)
E AT Price Medal Fund (1999)
E Gerald Whitrow Memorial Lecture Fund (2001)
E Fowler Prizes Fund (2004)

17 Designated funds

	1 January 2017 £	New designation £	Utilised/ released £	31 December 2017 £
Burlington House fund	1,022,796	—	(94,104)	928,692
Heritage Asset fund	9,440,879	—	—	9,440,879
Building fund	841,662	94,104	—	935,766
Open Access fund	400,000	—	—	400,000
RAS 200	544,552	—	(109,836)	434,716
Research and grants fund	393,227	—	(120,291)	272,936
Total designated funds	12,643,116	94,104	(324,231)	12,412,989

(i) Burlington House fund

Under lease agreements signed in 2005 with the Department of Communities and Local Government (previously Office of the Deputy Prime Minister - ODPM), the Society and four others in the Burlington House courtyard secured future occupancy on the basis of paying rent and additionally, being responsible for the external fabric of the building, following a renovation programme, carried out by the ODPM in mid-2006. In 2006-7, the Society executed a refurbishment project on the interior of the apartments. Expenditure incurred on the project has been capitalised and designated as the Burlington House fund.

(ii) Heritage Asset fund

A fund has been established to include the Society's heritage assets to recognise that there is no intention to dispose of these assets and the amount is not readily available to meet expenditure.

(iii) Building fund

The repairs and maintenance of the exterior of the building, its insurance and some security costs are carried out by the landlord for all the occupants and a proportion recharged to the Society. The Building Fund should provide for internal and external maintenance of the building and provide for the possibility, at the end of lease, if necessary, to obtain a building for the Society's use. The Finance Committee will recommend how much more to accumulate in this fund and at what rate. The timescale for expenditure is difficult to forecast but in principle could start within five years.

17 Designated funds (continued)**(iv) Open Access fund**

A fund has been established to provide against the risk of the possible collapse of the current business model for learned publishing due to various forms of open access. The timescale for expenditure is difficult to forecast but could in principle start within five years.

(v) RAS 200

The original fund balance of £1,000,000 was the total committed grant expenditure for RAS 200. RAS 200 grant expenditure is being charged to this fund from 2015 to 2022.

(vi) Research and grants fund

This represents those funds reclassified from restricted funds to be used for research and grants.

18 Analysis of net assets between funds

Fund balances at 31 December 2017 are represented by:

	General funds £	Designated funds £	Restricted funds £	Endowment funds £	2017 Total funds £
Tangible assets					
. Heritage assets	—	9,440,879	—	—	9,440,879
. Other fixed assets	103,238	928,692	—	—	1,031,930
Investments	4,024,302	1,455,127	525,065	1,720,442	7,724,936
Current assets					
. Debtors	541,171	—	—	—	541,171
. Cash at bank and in hand	3,006,447	930,206	134,568	62,140	4,133,361
Current liabilities	(1,753,995)	(222,818)	(2,365)	(62,140)	(2,041,318)
Non-current liabilities	(91,232)	(119,097)	—	—	(210,329)
Total net assets	5,829,931	12,412,989	657,268	1,720,442	20,620,630

19 Leasing commitments

At 31 December 2017, the charity had total future minimum commitments in respect of non-cancellable operating leases as follows:

	2017 £	2016 £
Lease expiring within two to five years – office equipment	15,720	26,613

20 Pension schemes

A qualified actuary carried out a triennial review of the defined benefit scheme as at 1 January 2016; the actuarial valuation showed that the market value of the Scheme's assets was £721,000, which represents 155% of the benefits that accrued to members after allowing for expected future increases in earnings. The actuary has calculated that no contributions are payable from 1 January 2016.

Pension costs comprise £56,239 (2016: £47,998) in respect of the defined contribution scheme and £4,091 (2016: £1,940) in respect of Death in Service contributions.

Retirement benefits disclosure under FRS102

The actuarial valuation for FRS 102 purposes, at 31 December 2017, shows a pension surplus of £353,000 which cannot be recognised as this is not available to the Society by way of reduced future contributions.

The amounts recognised in the balance sheet are as follows:

	2017 £'000	2016 £'000
Present value of funded obligations	(493)	(426)
Fair value of scheme assets	846	795
Surplus not recognised	(353)	(369)
Surplus in scheme at end of the year and available to the Society	—	—

Changes in the present value of the defined benefit obligations are as follows:

	2017 £'000	2016 £'000
Opening defined benefit obligation	426	301
Interest cost	11	11
Re-measurement arising from changes in assumptions & experience	56	114
Closing defined benefit obligation	493	426

Changes in fair value of scheme assets are as follows:

	2017 £'000	2016 £'000
Opening scheme assets	795	721
Interest Income	21	27
Actual return on plan assets, excluding interest income	30	47
Closing scheme assets	846	795

The amounts recognised in other recognised gains and losses are as follows:

	2017 £'000	2016 £'000
Remeasurement of defined benefit obligation	56	114
Return on plan assets	(30)	(47)
Effect of surplus restriction	(26)	(67)
Total	—	—

The actual return on scheme assets was £51,000 (2016: £74,000).

20 Pension schemes (continued)***Retirement benefits disclosure under FRS102 (continued)***

The major categories of scheme assets as a percentage of total scheme assets are as follows:

	Fair value of scheme assets	
	2017 %	2016 %
Equities	46	43
Bonds	16	17
Property	16	15
Cash	5	10
Gilts	17	15
	100	100

Principal actuarial assumptions at the balance sheet date (expressed as a weighted average):

	2017 %	2016 %
Discount rate at 31 December	2.5	2.6
Retail Prices Index	3.4	3.5
Consumer Prices Index	2.5	2.6
Increases in deferment	2.5	2.6
Future pension increases – pension earned before 6 April 1997	0.0	0.0
Future pension increases – pension earned after 6 April 1997	3.4	3.5

The current mortality rate assumptions include sufficient allowance for future improvements in mortality rates. The assumed life expectancy for a pensioner retiring at 65 on the balance sheet date is:

	2017	2016
Retiring now		
Male	21.9	21.9
Female	23.7	23.9
Retiring in 20 years		
Male	23.0	23.2
Female	25.0	25.4

20 Pension schemes (continued)**Retirement benefits disclosure under FRS102** (continued)

Amounts for the current and previous four periods are as follows:

Defined benefit pension scheme:

	2017 £'000	2016 £'000	2015 £'000	2014 £'000	2013 £'000
Defined benefit obligations	493	426	301	301	266
Scheme assets	846	795	721	707	662
Surplus	353	369	420	406	396

21 Grants committed

Grants, principally fellowships and travel and research grants to the value of £500,000 have been committed for future payment, subject to certain conditions, specified by the Society, having been met (2016: £550,000). These grants were not approved or communicated to the recipients until after the year end and therefore have not been accounted for in the year ended 31 December 2017.

22 Connected Charities and related party transactions

Since 2001, the Society has been the administration agent for the Trustees of FA Paneth Meteorite Collection, a charity connected to the Royal Astronomical Society. The Paneth Trustees decided that its income should support research in Cosmochemistry by graduate and postdoctoral students. The accumulated net expenditure of £26,115 (2016: £24,916), is included in Other Creditors. 7 Grants were awarded totalling £9,100 (2016 - £9,930). Total income was £10,299 (2016 - £10,000).

The Society also administers the Sir Norman Lockyer Memorial Trust, (charity registration number 900135). By agreement with the Charity Commission the Society includes the following information within these financial statements. Each charity remains a separate legal entity. The Norman Lockyer Fellowship is awarded to enable an outstanding researcher to devote the majority of their time to research on an astronomical topic, including solar system and planetary science. They are named after Sir Norman Lockyer (1836-1920), pioneering solar astronomer and discoverer of helium.

The fellowship is available every three years, with applications sought in the years 2013, 2016, 2019 etc. for fellowships starting in the following year.

The fellowship is open to those who hold a doctorate from a recognised institution of higher education at the time of taking up the award. Applicants must normally be 30 years of age or younger on 1 October of the year of appointment.

22 Connected Charities and related party transactions (continued)

The Society funds Fellows between spine points 35 and 40 (inclusive) on the UCU HE Framework single pay spine. The Norman Lockyer Fellowship is currently funding a three year fellowship from October 2017, totalling £156,000. The fund balance is £1,680,988 (2016: £1,538,887).

Transactions involving trustees are disclosed in note 10.

RAS Specialist Discussion Programme 2017**January**

- ◆ The ultra-low surface brightness universe
- ◆ Multi-scale dynamic auroral processes

February

- ◆ Timing and Spectroscopy in the New Era of X-ray Astronomy
- ◆ Understanding the Space environment before the space age

March

- ◆ The Golden Age of Extra-Galactic Optical Transient Surveys
- ◆ High-latitude magnetospheres: Earth, Jupiter, and Saturn

April

- ◆ Synergies between intensity mapping and optical galaxy surveys
- ◆ Science with cubesats

May

- ◆ The Large Synoptic Survey Telescope
- ◆ UK SEDI The frontiers of deep Earth research

October

- ◆ New frontiers in galaxy evolution modelling: the view from cosmological hydro-dynamical simulations
- ◆ Science of Primitive Asteroid Sample Return Missions

November

- ◆ The Initial Mass Function, from Top to Bottom
- ◆ Solar Orbiter: Synergy between Observations and Theory

December

- ◆ The link between AGN and galaxy formation
- ◆ Dynamic coupling in the terrestrial atmosphere (joint with RMetSoc)

RAS A&G 'Ordinary' Meeting Programme 2017**January**

- ◆ 2016 Winton Capital Award for Astronomy - Ralph Schoenrich (University of Oxford), 'Structure and History of the Milky Way'
- ◆ 2016 Winton Capital Award for Geophysics - Dali Kong (University of Exeter), 'Mysterious Interior of Jupiter and NASA's JUNO Mission'
- ◆ 2016 James Dungey Lecture - Betty Lanchester (University of Southampton), 'Some remaining mysteries in the aurora'

February

- ◆ Michael Penston Thesis Prize - Matt Nichol (Harvard-Smithsonian CfA), 'Unmasking the power source in superluminous supernovae'
- ◆ RAS Research Fellow - Richard Parker (Liverpool John Moores University), 'The Origin of the Galactic Field: where are the Suns born?'
- ◆ Group Achievement Award (G) - Ian McCrea (Rutherford Appleton Laboratory) EISCAT, 'EISCAT_3D: The future of incoherent scatter radars'
- ◆ Martin Rees (Institute of Astronomy, Cambridge), 'Prospects for SETI and the Breakthrough Listen Project'

March

- ◆ Dr John Armitage (Institut de Physique du Globe de Paris), RAS Research Fellowship, 'Can variations in the Earth's orbit create stratigraphic sequences?'
- ◆ Ms Jane MacArthur (University of Leicester), 'The first regolith breccia meteorite from Mars'
- ◆ 2017 Eddington Lecture - Professor Kathryn Johnston (Columbia University), 'Physical Manifestations of Evolution, Regularity and Chaos In and Around Our Galaxy'

April

- ◆ Melanie Vandenbrouck, (Royal Museums Greenwich), 'Whatever shines should be observed: astronomical prize medals'
- ◆ Professor Don Kurtz (University of Central Lancashire), 'Asteroseismology: A New Keplerian Revolution'
- ◆ Roger Walker (ESA), 'The Rise of CubeSats: from educational tools to operational systems'
- ◆ Charles Barclay (Marlborough College and University of Oxford), 'The International Olympiad on Astronomy and Astrophysics'

May

- ◆ 2017 Presidential Address - Professor John Zarnecki, 'Titan; The Moon that Thinks It's a Planet'

RAS A&G 'Ordinary' Meeting Programme 2017 (continued)**October**

- ◆ RAS Group Award 'G' - Professor Mark Lester (SuperDARN), 'The Super Dual Auroral Radar Network: New Insights into Earth's Space Environment'
- ◆ Professor Jim Bennett (RAS Diary Talk 2017) - 'The Origins of the Nautical Almanac, 1767'
- ◆ RAS Harold Jeffreys Lecture - Professor Tim Wright (University of Leeds), 'Monitoring our dynamic planet using satellite geodesy'

November

- ◆ James Dungey Lecture 2017 - Prof. Christopher J. Owen (Mullard Space Science Laboratory, UCL), 'Manifestations of the Dungey Reconnection Process within the Heliosphere'
- ◆ Dr Alan Stern (NASA), 'The Exploration of Pluto by NASA's New Horizons Mission'

December

- ◆ Michael Penston Thesis Prize In Astronomy 2016 - Dr Justin Alsing (Centre for Computational Astrophysics), 'Mapping the cosmos with weak gravitational lensing'
- ◆ Dr Sue Bowler (A&G Editor), 50 Years of Plate Tectonics
- ◆ George Darwin Lecture 2017 - Professor Catherine Heymans (University of Edinburgh), 'Observing the Dark side of our Universe'

Public Lectures**January**

- ◆ Gravitational lensing, or how to detect and measure the warps of space-time - Professor David Valls-Gabaud

February

- ◆ Exploring the Saturn System with the Cassini-Huygens Spacecraft - Professor Carl Murray (Queen Mary University of London)

March

- ◆ Gaia – Mapping the Milky Way from Space - Professor Gerry Gilmore, Cambridge University
- ◆ International Women's Day lectures – Professor Helen Mason, Dr Anasuya Aruliah, Dr Rosie Johnson, Professor Carolin Crawford, Dr Carole Haswell

April

- ◆ Our Dynamic Sun - Dr Helen Mason (Cambridge)

May

- ◆ ESA's Space Science and Exploration Missions - Professor Mark McCaughrean

October

- ◆ Photographing the Universe - Dr Marek Kukula, Public Astronomer, Royal Observatory Greenwich

November

- ◆ Cassini - The Grand Finale - Professor Michele Dougherty, Imperial College London

December

- ◆ How the Earth Works: 50 years of Plate Tectonics - Dr Sue Bowler, A&G Editor

2017 Awards and Medals

The following were recipients of the Society's 2017 awards and medals:

Gold Medal for Astronomy	Professor Nick Kaiser (University of Hawaii)
Gold Medal for Geophysics	Professor Michele Dougherty (Imperial College London)
Eddington Medal	Prof Cathie Clarke (University of Cambridge)
Price Medal	Prof Richard Holme (University of Liverpool)
Herschel Medal	Prof Simon Lilly (ETH Zurich)
Chapman Medal	Dr Mervyn Freeman (British Antarctic Survey)
Jackson-Gwilt Medal	Dr Ian Parry (University of Cambridge)
Agnes Mary Clerke Medal	Prof Clive Ruggles (University of Leicester)
Annie Maunder Medal	Dr Marek Kukula (Royal Observatory Greenwich)
Patrick Moore Medal	Mr Tim Browett (Robert Gordon's College)
Fowler Award for Astronomy	Dr Jonathan Pritchard (Imperial College London)
Fowler Award for Geophysics	Dr Christopher Chen (Imperial College London)
Winton Award for Astronomy	Dr Cosimo Inserra (Queen's University Belfast)
Winton Award for Geophysics	Dr Zhonghua Yao (UCL)
Group Achievement Award for Astronomy	Laser Interferometer Gravitational-Wave Observatory (LIGO)
Group Achievement Award for Geophysics	Super Dual Auroral Radar Network (SuperDARN)
Service Award for Astronomy	Mr Derek Fry (The Grammar School at Leeds)
Service Award for Geophysics	Prof Richard Harrison (STFC Rutherford Appleton Laboratory-Space)
George Darwin Lecture (Astronomy)	Prof Catherine Heymans (University of Edinburgh)
James Dungey Lecture (Geophysics)	Prof Christopher Owen (UCL)
Honorary Fellowship for Astronomy	Prof Michael J. Thompson (National Center for Atmospheric Research)
Honorary Fellowship for Astronomy	Professor Boonrucksar Soonthornthum (National Astronomical Research Institute Thailand)
Honorary Fellowship for Geophysics	Professor Maria Zuber (Department of Earth Atmospheric and Planetary Sciences, MIT)