LONDON MATHEMATICAL SOCIETY
EST. 1865

London Mathematical Society
Annual Review
2014–2015
150 Years and Counting

Welcome
from the President

I have always believed that Mathematics entangles with life in many unexpected ways. Being President of the LMS has given me so many opportunities to see this in action and confirmed my view that mathematics can be a wonderful thing to do and a truly human endeavour, as well as bringing great benefits to mankind. We have a Society with an incredible tradition and with a membership that includes so many creative mathematical scientists. It has been a true privilege to be your President.

One of my personal objectives as President has been to make sure the Society facilitated appreciation of the value of mathematics and mathematicians to our culture and society and helped the translation of that understanding into actions and support that builds the mathematics for tomorrow; I think that the progress we are making in this direction is tangible. One could not help but be very impressed by the shear vitality and diversity of subject at the Women in Mathematics meeting in Oxford, or the high level presentations in the joint birthday meeting with the European Mathematical Society in Birmingham. But it is an activity at many different levels. When Martin Hairer and Ben Green give LMS popular lectures of amazing quality on the same evening, one feels that the whole community understands the importance of regarding mathematics as a wider enterprise. One that starts with the engagement of youth, and continues through deep contributions to society to change the world we live in. I believe it is vital that we sustain this momentum; it is a joint effort where the Society can help but where our personal contributions as mathematicians are absolutely vital.

The 150th Anniversary of the Society has given many opportunities to stir up interest and justified respect for our discipline, as well as to remind people about the Deloitte report etc. The LMS Newsletter covered our opening event rather well so I won't repeat it here, but there has been much more, the talks of Andrew Wiles and Robert Calderbank at the BMC and Martin Hairer's addition to the long list of UK Fields Medal winners all underline the huge levels of achievement of UK mathematicians at the highest levels. The work various UK mathematics departments have been doing with the Science Museum is about to unfold into an exciting Festival of Mathematics for a wider but no less important audience. The efforts of the staff in the LMS have been huge in all these different activities and no doubt we owe them all a great thank you. The Local Heroes exhibitions also deserve a brief mention in the communication category, and some have received significant publicity on the BBC etc. In most cases the work was done by the library or museum building a display about a local mathematician often in association with a regional university, and the LMS facilitated in the background. However, in one case Kensington and Chelsea Library ran an exhibition on one of our past presidents Sydney Chapman where the Society (and particularly June Barrow Green and Mairi Walker) did most of the work. It was fascinating to appreciate just how much Chapman had achieved, from setting out the principles of kinetic theory of gases in in-homogenous media (for which somewhat superficially, he is known for the Chapman Kolmogorov equation). For example and in his day, this was key to separating isotopes and to the explanation of the earth's magnetic field. If that was not enough he also explained the (Chapman) Cycle that generates ozone in the atmosphere and which came under threat from aerosols. He reorganised the mathematics department at Imperial College and after the war he held the Sedleian Chair of Natural Philosophy at Oxford. During the war he was Deputy Scientific Advisor to the Army Council. Through his mathematical energy and imagination, Chapman had a massive impact on our lives today. Surely a model and challenge for the future.
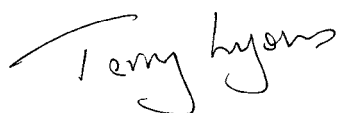
About LMS

Looking directly at the Society it has been another incredibly busy and successful year supporting research, creating awareness, trying to influence research policy and funding at UK levels and in building a development programme. Without doubt a big focus has been on delivering and using the 150th Anniversary as a tool to create momentum for mathematics.

I finish with a few words that guided our anniversary year:

- Mathematics transforms people's lives

- Mathematics is everywhere and for everyone

- Mathematics Research: Curiosity, Creativity, Discovery

We enter a challenging period with the comprehensive spending review. Whatever is decided there, I am sure our membership and our Society will work to build a sustainable future for our precious discipline and work to ensure mathematics continues to contribute to so strongly to our society and continues to provide the critical foundations required for 'unlocking worlds'.

Thank for having me as your president

Terry Lyons
President, London Mathematical Society

The London Mathematical Society (LMS) is the UK's learned society for mathematics. Its purpose is the advancement, dissemination and promotion of mathematical knowledge, both nationally and internationally. The Society receives its resources through publishing, investments, membership fees and endowments. Providing funding in support of mathematics is the primary mechanism through which the Society achieves its charitable aims. Such activities are vital for the continued health of mathematics as a discipline, which is critical to the UK economy and which impacts on a wide range of societal activities.

This past year has been an incredibly exciting and special year for the Society and one of the busiest in its history. The Society has been celebrating its 150th Anniversary throughout 2015 and, as well as carrying out its usual extensive range of activities, it has launched a series of new, innovative and enhanced events, programmes and projects to commemorate this historic occasion.

Celebrating the LMS
150th Anniversary

Mathematics Unlocking Worlds

The 150th Anniversary Launch on 16 January 2015 was held at The Goldsmiths' Hall, London, which has an appropriate historical link as it is the venue where the Society held its Centenary Dinner in 1965. The launch event introduced the year of celebrations, recognising and promoting 150 years of the Society, and highlighted the historical and continuing value and prevalence of mathematics to society and in day-to-day life – from entertainment to everyday objects, linking this to the underlying mathematics.

The presentations showcased the exciting ways in which mathematics touches so many parts of our daily lives and were given by mathematicians at the cutting-edge of mathematics research, whose successes have contributed to, amongst other things, the invention of the Kinect for XBox motion sensor, linking signals to masts which enables the use of mobile phones, and the mathematics in the making of TV classics such as *Dr Who* and *Sherlock* and big budget films including *Harry Potter* and *Life of Pi*.

Three hundred people, including many mathematicians, distinguished guests and school students attended the event and schools and colleges around the UK were invited to join the celebrations in real time via a streamed link.

The 150th Anniversary celebrations get off to a magnificent start at our Launch event in January

Celebrating with friends

On 18 June 2015 the Society held an Anniversary Dinner at The Goldsmiths' Hall, London where the after-dinner speaker was Dr Jim Simons who, with his wife, Marilyn Hawrys Simons, co-founded the Simons Foundation in 1994, a charitable organisation that supports projects related to education, health, and scientific research.

Dr Simons gave an interesting speech in which he talked about setting up Renaissance Technologies, which rapidly became one of the most successful hedge funds in the world through the careful analysis of trading data, developing and using of mathematical models, and by a hiring strategy that emphasises first-class research ability rather than experience in finance.

In deciding where to make major investments through his Foundation, Dr Simons invites top experts for brainstorming discussions and sees what ideas emerge. This approach leads to adventurous research; projects get funded which may appear risky, but where the potential payoff is very great. Crucially, he invests in 'don't know where it will lead' fundamental science, in contrast to the impact driven agenda of many governments. All grants are peer-reviewed.

Sir Michael Atiyah (Fields Medallist, former LMS president and the only person present to have been at the LMS's centenary dinner) proposed the vote of thanks for Dr Simons' speech and applauded his efforts in supporting science around the world.

Dr Jim Simons, The Simons Foundation

Looking to the future

The Society held its first ever Spring Reception in April 2015, generously hosted by Richard Golding with organisational support from Trevor Llanwarne CB. The reception was attended by 70 guests representing various government departments, Livery Companies, financial professional bodies, consultancy, technology and accountancy firms as well as academics from a number of mathematics-influenced disciplines. The aim of the Reception was to help the Society make connections with various different areas that use mathematics and with those who are influential in terms of policy and funding, to further the understanding of the importance of mathematics to the UK economy and to society generally.

Mathematics and Culture

Those involved in science, technology and finance are more and more aware of the crucial importance of mathematics, but this awareness is not so evident outside these communities. The value of mathematics is not only to be measured in terms of its critical relevance to these areas, though. It has intrinsic beauty, which is what has inspired people to study it for millennia, and the subject is increasingly recognised as a part of our culture in literature, films, and even in the fine arts. During the Anniversary year a number of exciting events and activities were organised to celebrate and promote mathematics and culture to the widest possible audiences.

150th Anniversary Local Heroes Museum Exhibitions

The Society invited museums across the UK to become involved in the Local Heroes programme with the Society supporting exhibitions celebrating mathematicians with significant relevance to a given museum's local region.

The UK is one of the major historical centres of mathematics research and advancement, driven by numerous prominent mathematicians and scientists. In celebrating their achievements, the LMS wished to trace the history of these academics, placing them in the context of the communities that supported them.

The aim of this programme was to promote the excitement and accessibility of mathematics to as wide an audience as possible, while allowing the public to engage with the history of the subject in their own regions. The LMS also wanted to promote connections between local mathematics academics and science outreach centres to the benefit of both.

Four exhibitions were funded, in Lincoln, Dundee, Tenby and Carrickfergus.

The exhibition in Lincoln celebrated the life and legacy of one of the world's finest mathematicians, who we have to thank for the technology behind all modern-day computers. The exhibition, which opened over the summer, was displayed at the University of Lincoln Library and also Lincoln Cathedral.

George Boole, who was born in Lincoln in 1815, was a self-taught mathematical genius whose work forms the basis of computer science and electronic circuitry. Boole laid the foundations of the digital era and is widely recognised as the forefather of the information age. Today, his legacy surrounds us everywhere. The modern computing device, whether it is a mobile phone, iPad, tablet computer or mainframe work station is essentially

Celebrating Sir D'Arcy Wentworth Thompson in Dundee

a Boolean calculator where information such as video, photos and audio are digitised and processed for our work and enjoyment

The LMS Local Hero for Dundee is Sir D'Arcy Wentworth Thompson, CB FRS, FRSE. Born in Dundee on 2 May 1860, Thompson was a biologist, mathematician and classics scholar. Professor of Natural History at St Andrews for 31 years. The exhibition took place at the University of Dundee Library.

The LMS Local Hero for Tenby is Robert Recorde. Born in Tenby in 1512, Recorde was a physician and mathematician. He invented the "equals" sign (=) and also introduced the pre-existing "plus" sign (+) to English speakers in 1557. The exhibits were displayed at Tenby Museum.

The exhibition in Carrickfergus celebrated the mathematician Robert Adrain. Born in Carrickfergus on 30 September 1775, Adrain emigrated to the United States in 1798. He became a leader in the American mathematical community. He published two proofs of the exponential law of error independently of Gauss.

150th Anniversary Artist Associates Scheme

Artists George Legendre and Mark Francis were commissioned by the London Mathematical Society during the first six months of 2015 to produce unique pieces of artwork that explore and celebrate the beauty and complexity of mathematics.

Conceived as part of the LMS 150th Anniversary programme, the scheme produced spectacular results that were first displayed at the LMS Anniversary Dinner.

Mark Francis produced a painting titled *Praxis 2015* and a sculpture. In both instances his work took as points of reference the graphic interpretations of abstract dimensions of mathematics. Inspired by his conversations with mathematicians Dr Iain Moffatt (Royal Holloway, University of London) and Dr Dorothy Buck (Imperial College London), Francis employed a modernist grid structure counter-balanced by dramatic, nebulous brush strokes that, he says, together point to, 'various themes to do with science […] imaginary networks which span the universe, and ideas of order and chaos that are intrinsically linked'.
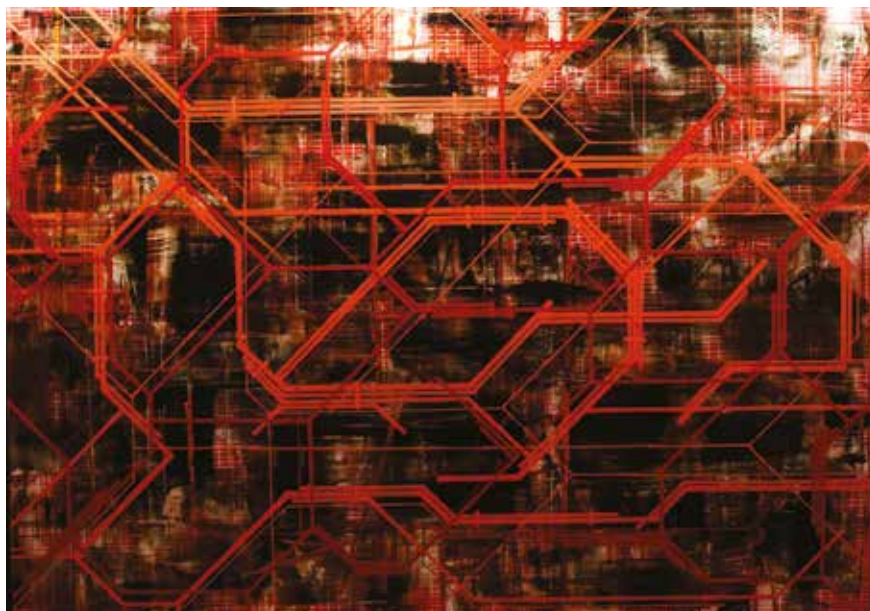
George Legendre, meanwhile, produced a series of intricate, 3D printed sculptures titled 30 Pieces. Examples included a skyscraper, a chair, a table and a football stadium. Drawing on his experience as an architect, Legendre's models were supported by detailed plans and drawings that, he says, are "written in the language of analytic geometry, computer-aided design, and numerically-aided fabrication." The ultimate aim, he emphasises, is to "pitch the familiarity of the everyday against the uncanniness of the mathematical." The six month journey from initial consultation, studio visits and conversations between the artists and mathematicians to the eventual exhibition at Goldsmiths' Hall provided considerable opportunity for both the Society and the artists themselves to learn more about the many fruitful connections between mathematics and art.

George Legendre 3D printed sculptures: 30 Pieces

Mark Francis and George Legendre (above) Praxis 2015 (left)

Scientific Meetings and Lectures

An exciting programme of scientific meetings has been taking place during the Anniversary year. These include enhanced activities for LMS sponsored events as well as activities organised specifically to recognise the Anniversary year.

150th Anniversary Celebratory Day at the Joint B(A)MC

The organisers of the joint BMC/BAMC four-day Colloquium held at the University of Cambridge in April kindly allocated a day of the event to celebrating the LMS 150th Anniversary.

Two distinguished mathematicians, Professor Robert Calderbank and Professor Sir Andrew Wiles, spoke as part of the day of celebrations. In addition a number of LMS sponsored Scheme 3 Research Groups held workshops. As part of the celebrations a Society meeting was held, followed by a 150th Anniversary reception.

Professor Sir Andrew Wiles presents his plenary lecture at the B(A)MC

Scientific Lectures

A number of distinguished mathematicians gave lectures throughout the UK to celebrate the 150th Anniversary Specific LMS Scheme speakers are listed below.

- *The Mary Cartwright Lecture* was given by Professor Maria Esteban, Université Paris-Dauphine, who spoke at a Society meeting in London in February 2015.

- The 150th Anniversary *Hardy Lecturer* was Professor Nalini Joshi, University of Sydney, who spoke at various venues across the UK as well as at the Society's General Meeting in London in July 2015.

- The 150th Anniversary *Invited Lecturer* was Professor Michael Shapiro, Michigan State University, who gave a course of 10 lectures at Durham University in March 2105.

- Jointly with the New Zealand Mathematical Society as part of the Forder/Aitken Scheme, the 150th Anniversary *Aitken Lecturer* was Professor Steven Galbraith, University of Auckland, who undertook a lecture tour of institutions throughout the UK. During 2015 Professor Endre Suli, University of Oxford, will similarly visit New Zealand as the *Forder Lecturer*.

Many other eminent speakers also gave talks at other scientific meetings throughout the celebrations.

150th Anniversary Regional Meetings

The LMS Regional Organisers have provided enhanced annual regional meetings during 2015.

The Northern Regional Meeting was held at Lancaster University in April where the meeting incorporated a Wikipedia Editathon.

The Midlands Regional Meeting was held at the University of Warwick in July and celebrated the 150th Anniversary through the involvement of international speakers. The topic of the conference was Finite Simple Groups. The South West and South Wales meeting will be held later in the year at the University of Southampton.

It All Adds Up: celebrating 150 years of women across the mathematical sciences

This four-day event was co-sponsored by, and held at, the University of Oxford in April 2015, when the Society's annual Women in Mathematics Day was expanded to include two days for school students and two days for university mathematicians and mathematical scientists.

For the school students each day featured inspiring talks by female mathematicians and workshops in which the students tackled stimulating mathematics themselves, and had opportunities to chat to undergraduates and others about mathematical possibilities beyond school level.

For university mathematicians and mathematical scientists the event comprised a mix of lectures by invited speakers, panel discussions on a range of topics, contributed talks by early career researchers, networking opportunities and posters.

LMS/EMS Joint Mathematical Weekend

Mathematicians from across the world met at the University of Birmingham to celebrate the 150th Anniversary of the London Mathematical Society (LMS) and the 25th Anniversary of the European Mathematical Society (EMS).

More than 150 mathematicians registered for the weekend with over 30 talks and sessions taking place.

Terry Lyons, President of the London Mathematical Society, said; '2015 is a very significant birthday year for both the LMS and the EMS, so I am particularly pleased that we have been able to organise a joint celebration of these historical milestones. This is a great opportunity for professional mathematicians to get together and have some intellectual fun, sharing some ideas around some world leading research'.

A wide range of talks and other activities at this year's Women in Mathematics event

Young Researchers in Mathematics meeting

The Young Researchers in Mathematics 2015 (YRM) conference was held in collaboration with Oxford Brookes University at the University of Oxford Mathematical Institute and was attended by around 180 delegates. The LMS 150th Anniversary Public Lecture was presented by Dr Vicky Neale (University of Oxford) titled *7 things you need to know about prime numbers* followed by an LMS sponsored reception, which gave the young researchers an opportunity to network with a wide range of mathematicians for a variety of subject areas.

LMS-CMI Research Schools during the Anniversary Year

Five Research Schools were planned throughout 2015.

The first School was at Loughborough University in April with the second at the University of Sussex in June. Following that, Schools were held at the University of Warwick, the University of Oxford and at Hay-on-Wye organised by the Universities of Warwick and Bristol.

LMS Computer Science Colloquium

The LMS held a Computer Science Colloquium at the Royal Society titled *Algorithms and Cryptography — Apology Accepted*, which was sponsored in part by GCHQ and Microsoft Research. Over 130 delegates heard stimulating presentations from experts in the field, giving excellent introductions to their topics as well as giving some idea of the complex issues involved. The colloquium was well received with one delegate commenting; 'it was wonderful event. I enjoyed each and every talk'.

Promoting Mathematics

The 150th Anniversary has provided the opportunity for the Society to increase advocacy for our subject and to respond creatively to changes in communications technology.

One of the Anniversary themes is to explore and exploit new ways of communicating mathematics. The Anniversary Launch on 16 January 2015 began a year-long programme of events to effectively engage and inform the general public about mathematics and used live-streaming to reach the widest possible audience. The LMS YouTube and Twitter accounts have also been used to good effect. The Society Twitter account now has over 1,900 followers and the Women in Mathematics feed has over 2,000 followers.

Mathematics Departments 150th Anniversary Celebrations

The Society was keen to involve as many of its members and the wider mathematics community as possible in celebrating such a momentous occasion. Through the LMS Representatives network mathematics departments across the UK were invited to hold LMS 150th Anniversary receptions, either as a standalone activity or as part of another event already being organised. The departments were asked to toast 'the continued health of the Society and mathematics'. At the time of writing 38 departments had applied to host a reception. Throughout 2015 the LMS Newsletter has contained photographs and articles about these celebrations.

Departmental celebrations across the UK

150th LMS Popular Lectures

For the 150th Anniversary the annual Popular Lecture series was expanded from the usual two speakers and took place at a variety of locations around the UK. These talks aim to bring mathematics to the general public, encouraging interest and excitement in the field.

This year's lectures were presented by Dr Hannah Fry, Professor Ben Green, Professor Martin Hairer, Professor Ruth King, Dr Joan Lasenby and Dr Colva Roney-Dougal in London, Birmingham, Glasgow and Leeds.

Other 150th Anniversary Activities in 2015-16

A number of other projects to celebrate the Society's 150th Anniversary are currently in development, and will run through to the end of 2015. These include:

- a Mathematics Festival at the London Science Museum. There will be an evening event on the 25th of November including a presentation by Professor Sir Roger Penrose. The remainder of the Festival from the 27th-29th of November is aimed at school students and the general public and will be an interactive experience with exhibits set up by nine mathematics research groups from across the UK;

- a film commissioned by the LMS for the Anniversary exploring mathematical thinking entitled, *Thinking Space*. The film comprises a series of interviews with nine UK-based mathematicians (Kevin Buzzard, Peter Donnelly, Tim Gowers, Martin Hairer, Roger Penrose, Caroline Series, Richard Thomas, Reidun Twarock and Karen Vogtmann). Interviews were conducted and selected by Martin Hyland. The film will be freely available to view via the Society's YouTube channel;

- the Launch of the *Who's Where in UK Mathematics Directory*, as a central resource of mathematicians in the UK to facilitate research collaboration and networking across academia and industry;

- an Anniversary edition of the Members' Handbook;

- a book by author John Heard, which will include the Society's history from its foundation until just after the First World War;

- a joint meeting with the Edinburgh Mathematical Society

- the publication of a collection of LMS Impact150 stories; and

- a joint meeting with the Royal Astronomical Society and the Institute of Physics.

Membership

Outreach
and Influencing

An active recruitment drive has been undertaken in 2014-15 which has seen a healthy new intake of members. As part of its Anniversary year, the Society has introduced a Special Offer so that new members, who are elected in 2015 and who pay their fees by direct debit, will be entitled to a 50% discount on subscription fees for the subscription years 2015-16 and 2016-17.

346 new members were elected in 2014-15 including 141 Teacher Training Scholars. New members are now able to apply for membership online, with the result that there are now more applications from younger members and from international members, thereby increasing the impact of the Society across the generations and more globally. Members are also now able to pay their subscriptions via direct debit and on-line card payment, and the Society is continuing to develop the website to improve the membership experience.

Signing the member's book

The Society continues in its efforts both individually and under the auspices of the Council for the Mathematical Sciences (CMS) to engage with decision makers in Parliament and across other STEM organisations to underline the importance of the mathematical sciences in modern society. This has included responding to government and national agency consultations and once again taking part in the SET for Britain competition.

During the past year the LMS has submitted responses to government and national agency consultations individually and as part of CMS.

- Consultation on revised Subject Benchmark Statement, Quality Assurance Agency (QAA) www.lms.ac.uk/sites/lms.ac.uk/files/LMS%20RESPONSE.pdf

- Developing new GCSE, A-level qualifications for first teaching in 2016, Ofqual www.lms.ac.uk/sites/lms.ac.uk/files/OfqualAlevelsResponseForm.pdf

- Reformed GCSE and A-level Subject Content, Department for Education (DfE) www.lms.ac.uk/sites/lms.ac.uk/files/Final%20Reformed%20Content%20Consultation%20%28DfE%29.pdf

- Independent Review of Open Access Implementation, Research Councils UK (RCUK) www.lms.ac.uk/sites/lms.ac.uk/files/RCUKOpenAccessresponse%28FINAL%29.pdf

- The Dowling Review of Business-University Research Collaborations, Royal Academy of Engineering www.cms.ac.uk/files/Submissions/article_56389b5ce5bb67.52928513.pdf

- Nurse Review of Research Councils, Department for Business, Innovation & Skills (BIS) www.cms.ac.uk/files/Submissions/article_553915d5703789.23364772.pdf

Development and Fundraising

There is growing recognition of the value of mathematics and its contribution to many different aspects of the economy and society. The London Mathematical Society is forging key links with government to highlight this contribution and to pursue the promotion and advancement of mathematics across the UK; however, widespread appreciation and funding for how mathematics informs so much of what we do remains a challenge. In developing its network of influential partners, the LMS plans to meet this challenge.

To this end the Society has introduced a series of formal dinners and other similar opportunities to assist in developing an influential community of external supporters from a wide range of fields, who it is hoped will support the Society in formulating and building a strong vision for the healthy future and development of UK mathematical sciences.

Grants and Support for the Mathematics Community

In 2014-15 a total of £768,693 was awarded in grants to support mathematical activities, a 34% increase from the previous year.

There has been a marked increase this year in the number of applications for the core grants (Schemes 1-5 and 8) – particularly for conferences, joint research groups in the UK and research in pairs. There is a continued rise in the number of applications for international short visits. This increase in applications demonstrates the real need for this funding within the community.

Through its core grant schemes the Society has supported many mathematicians and their research. Over the past year: 50 grants were made to organisers of conferences in the UK under Conference Grants (Scheme 1); 16 mathematicians were funded to support visitors to the UK under Scheme 2; Schemes 3 and 4 enabled 42 Joint Research Groups and Research Pairs to engage in collaborative research activities within the UK and more widely; six grants were awarded to support collaborative visits between the UK and Africa (Scheme 5); and nine Postgraduate Research Conferences were supported through Scheme 8 at which 375 postgraduate students attended.

Two new grant schemes made their first awards this year: the 150th Anniversary Postdoctoral Mobility Grants, to help improve postdoctoral mobility and Teacher CPD Grants to support continuing professional development for mathematics teachers.

LMS Undergraduate Summer School, Loughborough

LMS Undergraduate Summer School

The first Undergraduate Summer School was held at Loughborough University in July, with 50 delegates attending. The aim of the School was to introduce modern mathematics to the best UK undergraduates who are not currently in their final year of study. The School was a combination of short lecture courses with problem solving sessions and colloquium style talks from leading mathematicians.

Both delegates and speakers were delighted by the success of the school and Council has agreed funding for another School in 2016.

The Society has been developing an online grants application system with the intention of creating a streamlined, web-based process for applying for grants and submitting grants reports. The system is scheduled to undergo the first online tests later in 2015.

As well as supporting UK-based mathematics, the Society also supports mathematical activities on an international level. In 2014-15, a total of £22,336 was awarded in grants to support mathematics in Africa and Russia, under the Society's Scheme supporting conferences in Africa organised by the African Mathematics Millennium Science Initiative (AMMSI) and the *Young British and Russian Mathematicians* (YBRM) Scheme. Nine grants were awarded to organisers of conferences across Africa. Three mathematicians were funded to support visits to the UK from Russian mathematicians. The YBRM grant scheme is due to conclude at the end of 2015.

The current partnerships under the *Mentoring African Research in Mathematics* (MARM) programme continued this year. MARM operates in collaboration with AMMSI, using LMS funding combined with funding from the International Mathematical Union Commission for Developing Countries (IMU CDC). This is the fourth round of the programme and the current partnerships mean 17 awards have now been made in Cameroon, Congo, Ethiopia, Ghana, Ivory Coast, Kenya, Morocco, Nigeria, Rwanda, South Africa, Tanzania and Uganda. The programme was showcased at the Mentoring Emerging Nations: Achievements and Opportunities (MENAO) Symposium held in alignment with the International Congress of Mathematicians in August 2014. Matched funding has been secured from the IMU CDC to continue the MARM programme for a fifth round.

Information on all LMS grants can be found at www.lms.ac.uk/grants

LMS
Library

Queen of the Sciences

The Society held its inaugural meeting at University College London on Monday 16 January 1865 with Augustus De Morgan as its first President giving the opening address. Appropriately, throughout the Anniversary year there has been an exhibition at University College London (UCL) Library entitled *Queen of the Sciences: A Celebration of Numbers and the London Mathematical Society*. The exhibition contains early documents and photographs from the LMS archives at the UCL Main Library. The exhibition, displayed in three cabinets and across two floors of the library, is supplemented by material featuring the numbers one to nine from UCL's own Special Collections. An excellent description of the exhibition is available at www.ucl.ac.uk/library/exhibitions/queen-of-the-sciences/queen-sciences-exhib-cat.pdf

Sir Christopher Zeeman Archive

To mark the occasion of his 90th birthday in the year of the Society's 150th Anniversary, the Zeeman family produced an online archive of Sir Christopher's lifetime work. The Society was delighted to act as host to the archive of one of its Past Presidents which was launched on 19 March 2015 at the University of Oxford. The family invited the general public to send in birthday greetings along with any personal stories and photos from time spent with Sir Christopher. www.lms.ac.uk/2015/zeeman-archive-launch

Sir Christopher Zeeman, photograph by Nicholas Jackson

De Morgan Day

The Society held a joint meeting with the British Society for the History of Mathematics to mark the LMS 150th Anniversary. The *De Morgan Day* was held in De Morgan House and was dedicated to the Society's first President, Augustus De Morgan. Over 60 people attended a day that included six talks, a rendition of the Astronomer's Drinking Song and an exhibition on Augustus De Morgan, which was curated by Adrian Rice, Randolph-Macon College.

Augustus De Morgan

Other work

This year, three Library Placement Students were recruited as part of ongoing digitisation work for the Society's archives and resources, working particularly on electronically transcribing the Minute Books from 1866 to 1894 and the correspondence contained in the Hirst Letters, both of which are in preparation for digitisation.

The Society has also received a donation to its Library: 15 volumes of Yoshinara; and to its Archive: artefacts from the family of Henry Perigal (Society Member 1868–1897) related to his work on dissection-based proof.

LMS
Publishing

LMS
Prizes

As well as being the 150th Anniversary of the Society, 2015 also sees the 150th Anniversary of the *Proceedings of the London Mathematical Society* including the first paper published and the speech given by Augustus de Morgan at the first Society meeting.

The *Proceedings* has published many famous papers in its 150 years including particular papers by Hardy and Ramanujan, Turing, Marstrand, Atiyah, and Donaldson, to name but a very few, each of them a landmark in their field. During 2015 Oxford University Press has kindly agreed to make freely available several famous papers published by the Society. These are being publicised via Twitter and are available on the LMS website. www.lms.ac.uk/2015/publications

G.H. Hardy, LMS President (1926-1928 and 1939-1941)

The Journals Tender Group, assigned with choosing a new publishing partner for the Society from 2017, considered nine bids received from publishers and three were interviewed in February. The LMS Council has subsequently accepted the Group's recommendation that Wiley should be the Society's next publisher. The detailed contract with Wiley is expected to be agreed in November 2015.

Starting in 2015, LMS individual members were offered free online access to *Nonlinearity*, published jointly the LMS and the Institute of Physics. This supplements the offer, introduced in 2014, of free online access to the *Bulletin*, *Journal* and *Proceedings* of the LMS.

The LMS has publicised a Guide to Authors which gives an overview of the peer review process as it applies to the *Bulletin*, *Journal*, *Proceedings* and *Transactions* of the LMS.

The number of printed pages has decreased in 2015 by 14% for the *Bulletin*, by 17% for the *Journal*, 9% for the *Proceedings*, and 8% for the *Journal of Topology*. For *Compositio Mathematica*, there has been an increase of 9%. *Mathematika*, published by the LMS on behalf of University College London, moved from two issues to three issues per year from 2015 and the number of printed pages has increased by 47%.

The new open access online journal *Transactions of the London Mathematical Society* has published eight papers since its launch in 2014. Papers submitted before January 2016 will continue to benefit from a reduced open access charge (APC) www.lms.ac.uk/publications/tlms-submit#APC

Whitehead Prize

Professor Peter Keevash, University of Oxford

Dr James Maynard, University of Oxford

Professor Christoph Ortner, University of Warwick

Professor Mason Porter, University of Oxford

Dr David Loeffler, University of Warwick and Dr Sarah Zerbes, University College London

Professor Dominic Vella, University of Oxford

New Prizes for Mathematics

The Society this year awarded several new prizes including an additional prize in mathematics through a very generous donation from Professor Geoffrey Shephard. This has allowed the establishment of an endowment for the Geoffrey Shephard Prize, which is awarded for making a contribution to mathematics with a strong intuitive component which can be explained to those with little or no knowledge of university mathematics, though the work itself may involve more advanced ideas. This Prize will be awarded biennially starting in 2015 and the first prize was awarded as part of our Anniversary year.

In addition to the above, two new prizes were awarded specifically as part of the 150th Anniversary celebrations. These are the Hirst Prize and Lectureship for the History of Mathematics and the Prize for Communication of Mathematics.

The winners of the LMS Prizes for 2015 were announced at the Society General Meeting on 3 July 2015. The Society extends its congratulations to all the prize winners who are listed below.

Pólya Prize
Professor Boris Zilber, University of Oxford

Shephard Prize
Professor Keith Ball FRS, University of Warwick

Senior Whitehead Prize
Professor Robert Mackay FRS, University of Warwick

Naylor Prize
Professor Stephen Jonathan Chapman, University of Oxford

Berwick Prize
Pierre-Emmanuel Caprace, Université Catholique de Louvain

Nicolas Monod, École Polytechnique Fédérale de Lausanne

Anne Bennett Prize
Dr Apala Majumdar, University of Bath

Hirst Prize
Dr John O'Connor and Professor Edmund Robertson, University of St Andrews

Communication of Mathematics Prize
Professor Christopher Budd, University of Bath

Communicating
Mathematics

Social Media

Over the past year the Society has launched its own YouTube Channel (www.youtube.com/channel/UCvp7jsbXjx2k8sGEkdtWCAw) where films of our Popular Lectures and other events that have taken place throughout the Anniversary year can be accessed. In addition a new LMS Twitter feed *@LondMathSoc* was set up for the launch of the 150th Anniversary Launch event in January and this now has around 2,000 followers. The Society also maintains the Women in Maths Twitter feed *@womeninmaths* and *@DeMorganHouse*, which is used to market the Society's conference facilities.

Press and Media Relations

Over the past year the Society has achieved some notable press coverage for a range of events both at a national and regional level. Once again regional coverage was good for the SET for Britain event. The Society's Local Heroes exhibitions have also generated interest from the local press particularly in Wales, Lincoln and Northern Ireland.

We have been particularly pleased over the past year with the press coverage for the LMS 150th Anniversary events. This press coverage has hopefully helped to bring the activities of the Society and mathematics in general to a much broader audience.

Press coverage for 150th Anniversary events

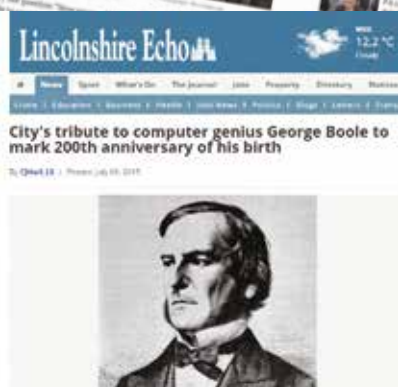|	
Londonist (What's On?)	*Queen of the Sciences Exhibition*
The Guardian	*150 Years of Mathematics in the UK*
The Guardian (Alex Bellos)	Ruth King Popular Lecture
Lincolnshire Echo	Lincoln Local Heroes
Wales Online	Tenby Local Heroes
BBC Radio Tenby	Tenby Local Heroes
Western Telegraph	Tenby Local Heroes
BBC Online Tenby	Tenby Local Heroes
Carrickfergus Times	Carrickfergus Local Heroes

Public Events

Mathematics was represented at the *Big Bang Young Scientists and Engineers Fair* held in March 2015, with a range of interactive demonstrations and activities, which once again proved to be very popular. Mathematics was once again well represented in the programme at the 2014 *British Science Festival*, which took place in Birmingham. The Joint Promotion of Mathematics representative continues to provide assistance and advice on publicity issues for the Mathematical Sciences Section of the British Science Association.

The Joint Promotion of Mathematics (JPM) Steering Group produced three leaflets in conjunction with the Royal Society and exhibitors at the Royal Society's *Summer Science Exhibition* in July 2015. Later in 2015 the JPM, in collaboration with *MathsWorld UK*, will present a number of interactive activities at the re-launched Bloomsbury Festival, which aims to promote mathematics to young people and the public.

The Society took part in Open House London for the fourth year. Opening up the building has allowed nearly 1,500 people to visit De Morgan House over the past four years, learning about the Society's history and its current work in supporting mathematics.

In 2015 LMS staff and volunteers from Open House welcomed around 300 visitors to this year's event and were on hand to offer refreshments and tours of De Morgan House. The tours focussed on the building's history, particularly on its early days as a family residence, and also on its many impressive architectural features. .The tour also drew attention to the 150th Anniversary year and to the work the Society does to promote mathematics around the UK.

The Society received widespread praise and thanks by visitors for the quality of the information given during the tours and there was significant interest in the De Morgan Exhibition that was initially created for the *De Morgan Day 2015* event, held as part of the 150th Anniversary celebrations.