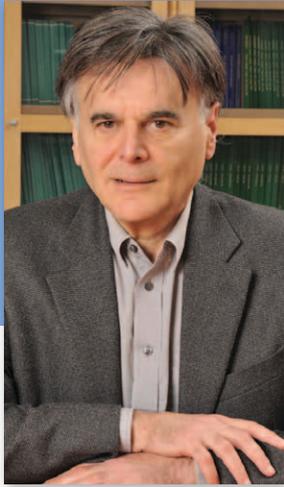


London Mathematical Society  
Advancing Mathematics

**ANNUAL  
REVIEW  
2011-2012**

Cover image: 2012 LMS Invited Lecturer, Professor Alexei Borodin, MIT (Anna Kirpichnikova)





## Welcome from the President

The past year has been my first as President of the LMS, and I am coming to understand the range of the

Society's roles and activities. The role that takes up most of the Officers' time is representing and standing up for the interests of mathematics to a large number of public bodies. Our greatest success during the year has been in raising the profile of mathematics in Parliament. For the first time ever our subject held centre stage with a prestigious mathematics seminar as part of the National Science and Engineering Week in March. The event took place in the House of Commons and was hosted by the Parliamentary and Scientific Committee and chaired by Andrew Miller MP (Chair, Commons Science and Technology Select Committee). Over 80 delegates attended, including MPs, Lords, academics, and representatives from a wide range of STEM organisations. We hope this will be just the beginning of regular meetings in the future.

During the year the LMS has also responded to a wide range of national consultations that will have an effect on mathematics in both universities and schools – in particular on *HE in STEM subjects*; on *A-level reform*; and on a *Vision for Science and Mathematics Education 5–19*. As a constituent body of the Council for the Mathematical Sciences (CMS) the Society continues to maintain a dialogue with both EPSRC and HEFCE. Over the past year it has also, both on its own and in conjunction with other learned and professional societies, been meeting with influential government Ministers to discuss, among other matters, the 'people pipeline' by which the mathematical community in the UK is sustained,

and the implications of requiring 'open access' to all research publication. Both of these issues have far-reaching implications for us all.

Beyond that, we have this year awarded more research funding than ever before, and we have been involved in the first UK-wide survey of good practice in mathematics departments, concerned especially with trying to attract, retain and promote more women mathematicians.

The Society has undertaken a membership drive, and we have asked for our members' views on broadening the criteria for membership. The response was overwhelmingly in favour of this. To help make our members more involved in the Society's activities the Treasurer has set up a network of LMS Representatives at institutions across the UK. As well as being a point of contact for the LMS and actively promoting membership we hope that they will also be able to communicate and explain the wide range of services and activities the Society offers. We now have LMS representatives in 48 institutions across the UK, and we expect that number to grow in the coming year.

It has once again been a challenging year for mathematics, and for the science community in general, and it is vital for the Society to maintain its position of influence and provide a solid base for dealing with future issues as they arise.

**Dr Graeme Segal**  
President, London Mathematical Society

## About the LMS

The London Mathematical Society (LMS), founded in 1865, is the UK's learned society for mathematics. The Society has as its purpose the advancement, dissemination and promotion of mathematical knowledge in the UK and worldwide. The Society's main activities include publishing journals and books, providing grants to support mathematics and organising scientific meetings and lectures. The Society is also involved in policy and strategic work to support mathematics and the mathematics research community. This work includes engaging with government and policymakers on mathematics education and

research, participating in international mathematical initiatives, and promoting the discipline.

The Society receives its resources through its publishing activities, investments, endowments and subscriptions. Providing funding in support of mathematical activities is one of the primary mechanisms through which the Society achieves its charitable aims, namely to 'promote and extend mathematical knowledge'. This is vital for the continued health of mathematics as a subject, which impacts on a wide range of societal activities.

# Public affairs: Representing mathematics and the community



LMS President, Dr Graeme Segal, asks a question at the NSEW seminar, Grand Committee Room, House of Commons (Jonathan Tickner)

## LMS and Parliament

Both in its own right and as a constituent body of the Council for the Mathematical Sciences (CMS), the LMS has been involved in a wide range of engagement activities in parliament over the past year.

## Young researchers and Parliament

For the first time mathematical scientists were invited to *Voice of the Future 2012*, which was an opportunity for scientists aged 16–35 to put their questions to an assembled panel of MPs at the House of Commons. The event, organised by the Society of Biology, took place at Portcullis House in March.

MPs attending the event included the Minister for Universities and Science, David Willetts MP; Shadow Minister for Innovation and Science, Chi Onwurah MP; and members of the House of Commons Select Committee on Science & Technology including its chair Andrew Miller MP.

The CMS in collaboration with the Parliamentary and Scientific Committee was also given the opportunity to sponsor a meeting on the mathematical sciences in parliament as part of National Science and Engineering Week 2012.

The event entitled *Mathematics Matters - A Crucial Contribution to the Country's Economy* took place in the Grand Committee Room, Westminster Hall. The meeting was chaired jointly by Andrew Miller MP, Chair, Parliamentary and Scientific Committee and Professor Paul Glendinning on behalf of CMS.

The panel session was chaired by Stephen Timms MP, Shadow Minister for Employment. The seminar was addressed by high profile academics and civil servants on a diverse range of subjects that showed how important the impact of the mathematical sciences is on our everyday lives. These included:

- *The Mathematical Sciences Landscape in the UK*, Sir Adrian Smith, FRS, Director General, Knowledge and Innovation, BIS
- *Assessing and Communicating Risks and Uncertainty*, Professor David Spiegelhalter, FRS, University of Cambridge.
- *Mathematics in Security and Intelligence*, Professor Malcolm MacCallum, Heilbronn Institute, Bristol
- *More than Counting Cases: Mathematics and Control of Infectious Diseases*, Dr Deirdre Hollingsworth, Imperial College, London
- *Mathematics of Information*, Professor Jared Tanner, University of Edinburgh

As well as representatives from the House of Lords, the seminar was attended by over 80 representatives from a wide range of STEM organisations. A full report of the event appeared in *Science in Parliament* magazine, which is sent to all MPs.

## Meetings with Ministers

The LMS Executive Secretary Fiona Nixon and Professor Frank Kelly, Chair of CMS met with the Science Minister Rt Hon David Willetts MP in May, along with colleagues from the Institute of Physics, the Royal Society of Chemistry and the Society of Biology. A range of topics was discussed, including the case for research funding and the implications of open access for scientific publishing.

## Maths in Parliamentary publications

As part of CMS the LMS helped to produce an article that was published in the autumn issue of *Science in Parliament* magazine.

The article was written by Professors Ken Brown (University of Glasgow, Vice-President of LMS) and Paul Glendinning (University of Manchester, Vice-President of IMA). The article looks at the special history of mathematics, its major impact on our lives, and the relevance of these aspects for current debates around the funding of research in the UK.

Andrew Miller MP addresses the NSEW seminar (Jonathan Tickner)



## LMS responds to national consultations

Over the past year the Society continued to help shape the future of mathematics and represent the community on a number of major issues. To this end the Society has worked with the Department for Education (DfE) on the Review of the National Curriculum and the teaching of mathematics in schools. In addition, position statements and responses have been submitted to the following reports and consultations: Advisory Committee on Mathematics Education (ACME): *Bridging the Mathematics Gap*, Royal Society: *Vision for Science and Mathematics 5–19*, Training and Development Agency for Schools (TDA): *Review of Accreditation Criteria for ITT*, Department for Education: *Study Programmes for 16–19 Year Olds and the Funding Formula Review for 16–19*. The Society also made a submission to the House of Commons Select Committee inquiry on *How Should Examinations for 15–19 year olds in England be Run*, and released a Position Statement on Textbooks and Teacher CPD.

The Society has submitted formal responses, as part of CMS, on the House of Lords Select Committee call for evidence: *HE in STEM subjects*, HE Commission: *Postgraduate Education Inquiry* and EPSRC: *Action Plan on the International Review of Mathematical Sciences*. The Council for the Mathematical Sciences communicated regularly with EPSRC about the mathematical community's concerns regarding funding for mathematical physics and the Shaping Capability agenda.

### Other activities

The Society and the IMA have continued their collaborations throughout the year. These include the award of the David Crighton Medal, the presentation for which will take place in early 2013. Joint press statements have also been issued by the two Societies over the past year on mathematics and further mathematics A-level results and the Ofsted report; *Mathematics: made to Measure*.

## Communicating with LMS members and the community



In March 2012, as a means of updating members regularly on Society news, events and grants deadlines alongside the Society's *Newsletter*, the Society began sending fortnightly LMS e-Updates to its members.

In May 2012, the Society hosted an induction event for LMS Reps from institutions across the UK. A network of LMS Reps has been created to help promote the Society at individual universities. Currently there are 48 LMS Reps, of which 25 attended the induction event and work continues to have LMS representatives in all UK mathematics departments.

At the end of July 2012, the Society launched an online survey on *Criteria for Membership of the LMS* and invited all LMS members to participate. This survey is now complete with 913 (approximately 41%) current LMS members submitting their views. Council will be considering the feedback received through the survey and will use this to inform future planning discussions.

In July 2012 the Society was represented at the 6th European Congress of Mathematicians in Kraków, Poland and prior to that sent a delegation to the Council Meeting of the European Mathematical Society (EMS) also held in Kraków. Many interested mathematicians from the UK and around the world visited the LMS stand in Kraków to discuss the Society, and mathematics in the wider world. A formal Society meeting was also held there during which the Programme Secretary gave a presentation about the Society's activities before a talk was given on the theme of *Mathematics of Planet Earth 2013*. The Meeting was followed by a reception. Over 100 mathematicians and those interested in mathematics from around the world attended. Five members took the opportunity to sign the Members' book. The Members' Book, which dates back to 1865 when the Society was founded, contains signatures of members throughout the years, including De Morgan, G.H. Hardy and Mary Cartwright. At each Society meeting, members of the Society are invited to sign the Members' Book, if they have not already done so and if they have paid their first subscription.



Top left image: Dr Tim Burnes, LMS Representative, University of Southampton  
Top Right image: Dr Natalia Petrovskaya, LMS Representative, University of Birmingham  
Bottom image: LMS at ECM meeting in Kraków

## LMS research grants

The grant schemes are funded from the Society's resources received from its endowments, investments and publishing activities and are one of the primary mechanisms through which the Society achieves its central purpose, namely to 'promote and extend mathematical knowledge'. The Society continues to support mathematic research and collaboration across the mathematical sciences community. In 2011-2012 the Society awarded £458,601, with £177,617 for mathematical conferences, £55,834 to support Joint Research Groups and Research in Pairs, and £29,054 to support academic visitors to the UK.

## Other supported activities

### LMS invited lectures

The 2012 LMS Invited Lecturer Professor Alexei Borodin (MIT) visited Glasgow in March. The lectures were filmed by the University of Glasgow.

### LMS Computer Science Day

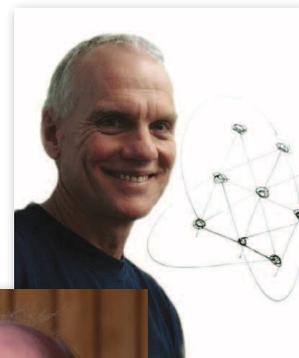
The LMS in partnership with the Centre for Numerical Algorithms and Intelligent Software (NAIS) hosted a day of talks in October, which centred on the theme of *Performance Scientific Computing at the Exascale*, as part of the Society's activities to support the interface of mathematics and computer science. The meeting showcased state of the art scientific computing applications, to identify some of the challenges posed by next generation high performance machines and indicate promising approaches to tackling problems. Forty-one people attended the colloquium, including 20 PhD students.

## Society Meetings

In April, the LMS hosted a Society Meeting at the British Mathematical Colloquium (BMC) in Kent which was attended by over 100 members and guests.

In May, the LMS held a Society Meeting to mark the 100th Anniversary of the death of Henri Poincaré. Over 70 members and guests attended a full day of lectures about Henri Poincaré; the man and the mathematician, and his legacy to mathematics. There was also an exhibition of photographs and letters from the Poincaré Archives held at the University of Nancy in France.

Aitken Lecturer,  
Professor Geoff Whittle  
(University of Wellington)



Forder Lecturer, Professor Geoffrey Grimmett (University of Cambridge)

## LMS Hardy Fellowship

The 2012 Hardy Fellowship was awarded to Professor Etienne Ghys (University of Lyon). Professor Ghys visited the UK twice in June to give lectures at the universities of Aberdeen, Edinburgh, Sheffield, Newcastle, Bristol, Reading and Warwick and finishing at the London General Meeting where he gave an interesting talk on *On cutting cloth, according to Chebyshev*.

## LMS-NMS Aitken/Forder Lecture

Following the agreement with the New Zealand Mathematical Society (NMS) to introduce the Aitken Lectureship, to run in conjunction with the Forder Lectureship, the inaugural Aitken Lecturer was announced as Professor Geoff Whittle. Professor Whittle visited the UK in October 2011. This year's Forder Lecturer, Professor Geoffrey Grimmett, visited New Zealand in April 2012.

## LMS Prospects in Mathematics

The 2011 LMS *Prospects in Mathematics* event for final year undergraduates interested in research careers was held at the University of Bristol in December. The event was attended by 50-60 final year undergraduates, both male and female, from across the UK. Talks were given by a number of speakers on a range of subjects within mathematics over two days and also included sessions from the three main Doctoral Training Centres; Lancaster, Cambridge and Warwick. Students were enthusiastic about continuing into postgraduate study and enjoyed attending an event which offered guidance on further study and research.



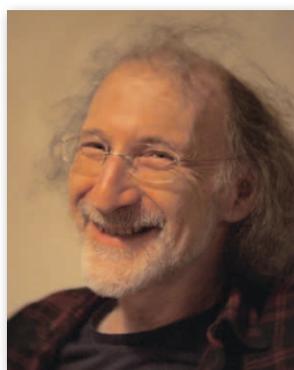
2012 Hardy Lecturer, Professor Etienne Ghys, University of Lyon (Jonathan Tickner)

## LMS Prizes

The LMS celebrates achievements across the mathematical community by awarding several prizes each year. The Council for the London Mathematical Society announced the 2012 Prize winners at the Society Meeting held at University College London on 29 June 2012.

The awards will be presented at the Society's Annual General Meeting on 16 November 2012.

**Congratulations to all the prize winners.**



Professor Dan Segal



Professor Trevor Wooley



Professor Ian Agol



Dr Toby Gee



Dr Eugen Vărvăruță



Dr Sarah Waters



Professor Andreas Winter

**Pólya Prize**

**Fröhlich Prize**

**Senior Berwick Prize**

**Whitehead Prize**

**Whitehead Prize**

**Whitehead Prize**

**Whitehead Prize**

Professor Dan Segal, University of Oxford

Professor Trevor Wooley FRS, University of Bristol

Professor Ian Agol, University of California, Berkeley

Dr Toby Gee, Imperial College London

Dr Eugen Vărvăruță, University of Reading

Dr Sarah Waters, University of Oxford

Professor Andreas Winter, University of Bristol



## LMS Publishing

During the past year Council endorsed a Publications Strategy having as a key part the protection of the Society's core publications while allowing the flexibility to explore new opportunities in publishing. There was an increase in net income from publications of 3%. This represents a good return in what has been an adverse economic climate. The journals have continued to grow in size with increases to the *Journal*, *Proceedings* and *Mathematika* by 17%, and to the *Bulletin* by 8%. This increased research output will boost the Society's ability to sustain its income from publishing. The Society's web-based article management system for authors, reviewers and editors, introduced in mid 2011, has streamlined the paper flow and over the past year has led to reduced times for peer review, benefiting both mathematics and mathematicians.

## LMS Good Practice Scheme

The LMS strongly supports advancing women's careers in university mathematics departments. The Society's Women in Mathematics Committee has developed a Good Practice Scheme with the aim of supporting mathematics departments interested in embedding equal opportunities for women within their working practices. The Scheme will provide specific support for departments working towards Athena SWAN Award status.

As part of the Scheme, the Society undertook a Benchmarking Survey of

mathematics departments in the UK. The LMS commissioned the survey of UK mathematics departments, which started in early June 2012.

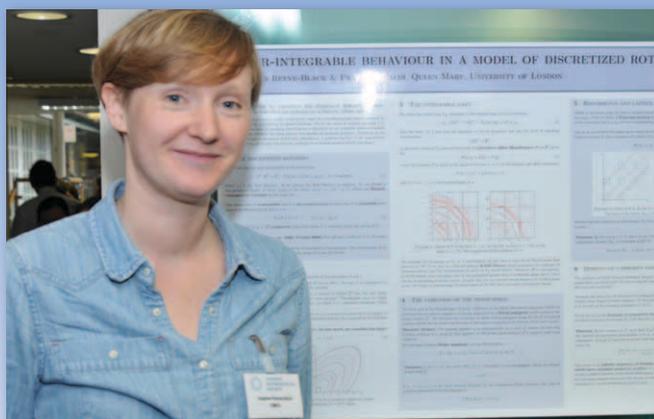
The purpose of this survey was to collect examples of good practice (in equality and diversity) in mathematics and to benchmark departments on their working practices, processes and procedures. This exercise looked at identifying the current strengths and weaknesses across the UK and will enable departments to assess themselves in relation to the national picture.

There is currently no information of this kind either being collected or in existence for mathematics in the UK and the Society is pleased to both manage and fund such an important exercise on behalf of the community. This has the support of the Heads of Departments of Mathematical Sciences (HoDoMS) and CMS. A report on the survey will be launched at an event to be held in the House of Commons in February 2013.

## LMS Women in Mathematics Day

The LMS is active in championing women in mathematics and helping to remove the barriers that they have faced while working in the subject. The Society's Women in Mathematics Committee again ran a very successful Women in Mathematics Day in May 2012. The day provided a forum for women to present talks on mathematics and also offered the opportunity for informal networking. The 2012 event attracted over 80 participants (both women and men), including students, academics, teachers and mathematicians working in industry.

Winner of the 2012 Women in Mathematics Day poster competition: Heather Reeve-Black, QMUL (Jonathan Tickner)



An opportunity to network  
(Jonathan Tickner)

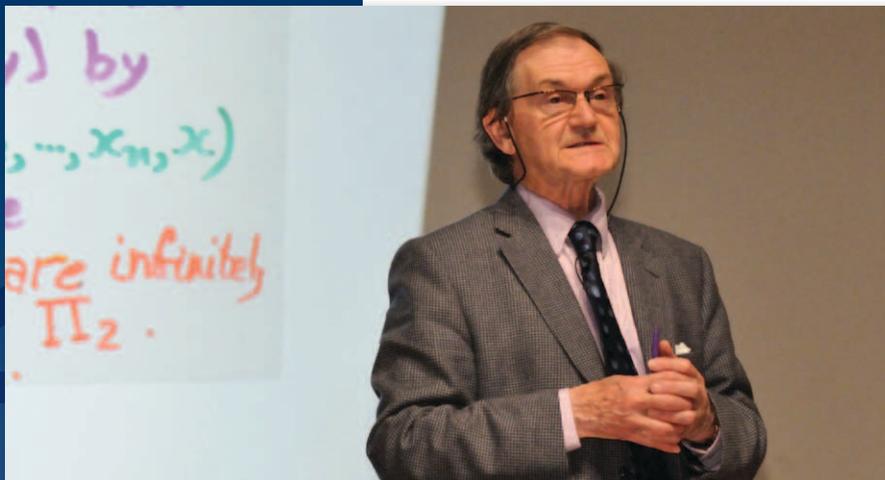
## Promoting mathematics

The Society is involved in a range of activities, promoting mathematics to the wider scientific community and the public. This includes, lectures, exhibitions and other activities, including the Bloomsbury Festival.

### Popular Lectures

This year (2012) marked the 30th anniversary of the London Mathematical Society (LMS) Popular Lectures, but none can have been more popular than this year's London event. Professor Sir Timothy Gowers FRS (University of Cambridge) and Professor Sir Roger Penrose FRS (University of Oxford) presented their lectures to an audience of nearly 900 at the Institute of Education in June. The audience came from a broad range of backgrounds and included academics, university students, teachers, school and college students, and the general public. The lectures were repeated in Birmingham to an audience of almost 400.

Gowers and Penrose are two of the UK's finest mathematicians and their experience and knowledge provided two entertaining and stimulating lectures. Gower's lecture was entitled *Can anything be salvaged from the wreckage of Hilbert's dream?* and Penrose's lecture was entitled *On Attempting to Model the Mathematical Mind*.



Professor Sir Roger Penrose eloquently evokes the Turing legacy (Jonathan Tickner)



Professor Sir Timothy Gowers presents a memorable lecture (Jonathan Tickner)

## Maths Promotion Network

A reception was held at De Morgan House on Tuesday 20 September 2011. The event consisted of short presentations on the *Mathematics Matters* case studies from Professor Nigel Peake (University of Cambridge), Dr Robert Leese (Smith Institute) and Dr Neil Dodgson (University of Cambridge) followed by the opportunity to talk with colleagues. There were thirty eight participants, including Stephen Timms MP, Maths Prom members and representatives from other STEM organisations.

## LMS Library

The London Mathematical Society collection of mathematical books began in 1866 and was housed at UCL until 1870. After moving to Albemarle Street and later the Science Museum, the Society's Library returned to UCL in 1928 where it can still be found today.

The LMS Library is integrated with the mathematics section of the University College London (UCL) Library. Members of the London Mathematical Society have access to the combined resources of UCL and the LMS, and can use all the material available in the reading rooms and stores of the UCL libraries.

## Open House success continues

Open House was once again a success for the LMS, with 230 people visiting De Morgan House on Sunday 23rd September. Members of LMS staff along with Open House volunteers acted as guides on the day. There were regular tours of De Morgan House with information about the architecture of the building and the history of the LMS including a timeline presentation (with a section on Alan Turing), along with a short Poincaré exhibition. The event was also an opportunity to distribute the LMS Annual Review, and also provide information leaflets on the LMS, including Membership, Grants, Events and Women in Mathematics.

Visitors were given a tour of the Reception area, Room 14 with its extensive views over Russell Square and the Members' Room on the second floor. The tour route also allowed visitors to view pictures of all the LMS Presidents.

As with 2011, the majority of people attending were regular visitors to Open House events and therefore particularly interested in the architecture. There was also an interest in the history of the Society and in mathematics in general. There was a wide range of ages and nationalities with several families attending. There were also some A-level students wishing to study mathematics at university and several visitors had graduated with degrees in mathematics.



## Maths Inside

The LMS worked in collaboration with the IMA to produce three A5 leaflets linked to exhibits at this year's Royal Society Summer Science Exhibition (3–8 July 2012). The leaflets were available at the exhibition and are also used for promotional purposes after the event. The topics covered in this year's leaflets are measuring the speed of avalanches, mapping the country's genes and using mathematics to uncover the secrets of the universe (using the Atacama Large Millimeter Array (ALMA) of telescopes).

For more information on  
all LMS activities visit:  
[www.lms.ac.uk](http://www.lms.ac.uk)





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