16 November 2012

A personal view

Although the November Council meeting was shorter than usual Council meetings, due to the AGM taking place immediately afterwards, its reduced length did nothing to diminish members’ enthusiasm for discussion. On this occasion it was a paper presented by Council Webmaster, Robert Wilson, and Vice-President, Ken Brown summarising the current situation of the ‘De Morgan Journal’ (DMJ) - the Blog for matters relating to mathematics education and education policy, editorial control of which rests with the Education Committee - and the developments and discussions on it to date, that stimulated the most debate. The main point at issue was the actual name of the Blog, in particular, whether it is appropriate to use the term ‘journal’. Some members of Council were concerned that there could be damage to the reputation of the Society’s publications if the DMJ were to be viewed as an official publication, although others held that misunderstandings on this point had not arisen. Even though it was acknowledged that the name DMJ had become known in mathematics education circles, Council agreed that, in order to avoid any possible confusion in the future, it was better to amend the name to ‘De Morgan Forum’. In addition, it was agreed that the section of the Blog dedicated to publishing articles should be renamed without using the term ‘journal’, with responsibility for proposing a new name being delegated to Education Committee.

The Education Secretary, Tony Gardiner, asked Council to consider the possibility of awarding a second Cecil King Travel Scholarship in 2013. Council was supportive of the idea and it was suggested that consideration should be given to making this award specifically for a pre-doctoral candidate with the Society itself funding the second award. The Education Secretary was asked to prepare a full proposal for consideration at the February 2013 Council meeting.

Over recent months it has become increasingly apparent that the Society’s Charter, Statutes and By-Laws by which the Society manages its governance are no longer fully fit for purpose. A number are now redundant, while others are somewhat out-of-date not reflecting, for example, modern methods of communication. To date amendments to By-Laws have been proposed as and when issues have arisen but it is clear that such a piecemeal approach is not really satisfactory. In recognition of this, the General Secretary, Martin Hyland, proposed that the Society should undertake a full review of its Charter, Statutes and By-Laws. Council agreed and a small Working Group is going to be set up to oversee the process.

The President closed the meeting
by expressing very warm thanks on behalf of the Council for the work of those Officers and members-at-large who would be leaving Council: Martin Hyland, Alexander Borovik, Dorothy Buck, Wilfred Kendall and Burt Totaro. He wished good luck to all those standing for re-election and thanked them for all the work they had done thus far.

June Barrow-Green

RETIRING OFFICERS

PROFESSOR MARTIN HYLAND

(Genral Secretary)

After three years in office, Professor Martin Hyland stood down as General Secretary at the November 2012 AGM. He has been a great asset to the work and development of the Society during his tenure. In 2009, having not previously held an office of Council, he agreed to take on the position of Council, he agreed to take on the position of Council and he has been particularly active in developing the Society's position statements on education, directed towards influencing government policy. The LMS hopes to build on the developments he has initiated over the past year, and would like to thank him for his contribution to the Society and wish him well in the future.

Committee members

In addition to the foregoing the Society thanks all those who have served as members of Council and of its various committees and who are now standing down. Without such dedicated volunteers we should be unable to support and represent mathe-matics community and the mathematical community as we do.

LMS NEWSLETTER http://newsletter.lms.ac.uk

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LMS NEWSLETTER

No. 421 January 2013

2012–13 COUNCIL

As a result of the annual election, membership of the Council is the following:

President                          Dr G.B Segal, FRS (University of Oxford)
Vice-Presidents                   Professor KA. Brown, FRSE (University of Glasgow)
Treasurer                         Professor J.P.C. Greenlees, (University of Sheffield)
General Secretary                 Professor R.T. Curtis (University of Birmingham)
Programme Secretary              Professor S.A Huggett (University of Plymouth)
Publications Secretary           Professor R.A. Wilson (Queen Mary, University of London)
Education Secretary              Professor J.D.S Jones (University of Warwick)
Members-at-Large                  Professor F.A. Rogers (King's College London)
                                    Dr J.E. Barrow-Green (Open University) – current LMS Librarian
                                    Dr F.W. Clarke (University of Swansea) – elected to a one year term
                                    * Professor Sir S.K. Donaldson, FRS (Imperial College, London)
                                    * Dr C.A. Hobbs (University of the West of England)
                                    * Professor J.R. Hunton (University of Leicester)
                                    * Professor A. Laptev (Imperial College, London)
                                    * Professor E.L. Mansfield (University of Kent)
                                    * Professor B. Pelloni (University of Reading)
                                    Dr C.M. Roney-Dougal (University of St Andrews)
                                    Professor M.A. Singer (University of Edinburgh)
                                    * Professor U.L. Tillmann, FRS (University of Oxford)
                                    * Professor A.P. Veselov (Loughborough University)

Nominating Committee

Also at the AGM, Keith Ball (University of Warwick) and David Tranah (CUP) were elected to the Nominating Committee for three year terms of office. Gavin Brown (University of Loughborough) was elected for a one year term.

Continuing members of the Nominating Committee are Penny Davies (Chair), Frances Kirwan, FRS, Michael Prest and Andrew M. Stuart. Council will also appoint a representative.

LMS GRANT SCHEMES

Next Closing Date for Research Grant Applications: 31 January 2013

Applications are invited for the following grants:

• Conferences and postgraduate research conferences held in the UK (Schemes 1 and 8)
• Celebrating new appointments (Scheme 1)
• Visits to the UK (Scheme 2)
• Research in Pairs (Scheme 4)
• International short visits with the main focus on Africa (Scheme 5)

For full details of these grant schemes, and to download application forms, visit the LMS website: www.lms.ac.uk/content/research-grants.

Applications received by 31 January 2013 will be considered at a meeting in February.

• Applications should be submitted well in advance of the date of the event for which funding is requested.
• Normally grants are not made for events which have already happened or where insufficient time has been allowed for processing of the application.

Queries regarding applications can be addressed to the Grants Administrators or the Programme Secretary (see below) who will be pleased to discuss proposals informally with potential applicants and give advice on the submission of an application.

• Grants Administrators: Sylvia Daly, Elizabeth Fisher and Barbara Graczyk (tel: 020 7291 9971/3, and 0207 927 0808,
LMS NEWSLETTER  
http://newsletter.lms.ac.uk

email: grants@lms.ac.uk.
• Programme Secretary: Rob Wilson (email: r.a.wilson@qmul.ac.uk).

OTHER LMS GRANTS AND FUNDING

Computer Science Small Grants (Scheme 7)
Funding for grants up to £500 is available to support a visit for collaborative research at the interface of Mathematics and Computer Science either by the grant holder to another institution within the UK or abroad, or by a named mathematician from within the UK or abroad to the home base of the grant holder. The next deadline for applications is 31 January 2013 – please see the website for further details: www.lms.ac.uk/content/computer-science-small-grants-scheme-7.

Childcare Supplementary Grants
Grants of up to £200 are available to parents working in mathematics to help with the cost of childcare when attending a conference or research meeting. The Society believes that all parents working in mathematics should be able to attend conferences and research meetings without being hindered by childcare costs. Institutions are expected to make provision for childcare costs and parents are encouraged to make enquiries. However, where this is not available, the Society administers a Childcare Supplementary Grants Scheme. Further details can be found on the LMS website: www.lms.ac.uk/content/childcare-supplementary-grants.

Small Grants for Education
Funding for grants up to £800 is available to stimulate interest and enable involvement in mathematics from Key Stage 1 (age 5+) to Postgraduate level and beyond. Anyone working based in the UK is eligible to apply for a grant. If the applicant is not a member then the application must be countersigned by an LMS member or another suitable person such as a Head teacher or senior colleague. The next deadline for applications is 31 January 2013. Please see the website for further details: www.lms.ac.uk/content/small-grants-education.

LMS-EP SRC Short Courses
The Society and EPSRC offer funding of up to £12,200 (including honoraria for organisers) towards the cost of running a one-week Short Course which provides high quality training for postgraduate students in core areas of mathematics. For further information on Short Courses and how to submit a proposal, please visit: www.lms.ac.uk/content/short-course-organisers.

Research Workshop Grants
The Society offers grants to support for Research Workshops held in the UK. Requests for support (for travel and subsistence of participants, and reasonable associated costs) in the range £1,000 - £10,000 will be considered. For further information and application forms, visit: www.lms.ac.uk/content/research-workshops-grants.

Spitalfields Days
Grants of up to £500 are available to support an LMS Spitalfields Day, which have been run since 1987 and are in honour of the Society’s predecessor, the Spitalfields Mathematical Society (1717-1845). A Spitalfields Day is a one-day meeting, which is usually associated with a long-term symposium on a specialist topic at a UK university. Selected participants, often distinguished experts from overseas, give survey lectures (or other types of lecture accessible to a general mathematical audience) on topics in the field of the symposium. Further details can be found on the LMS website: www.lms.ac.uk/content/spitalfields-days#applications.

Young British and Russian Mathematicians Scheme

Visits to Russia
Applications are invited from young British post-doctoral mathematicians who wish to spend a few weeks in Russia giving a series of survey lectures on the work of their school. The LMS is offering grants of up to £500 to meet the travel costs, while the host should apply to the Russian Academy of Sciences for funding towards local expenses for accommodation and subsistence. Contact Sylvia Daly (grants@lms.ac.uk) for information before contacting the Russian Academy of Sciences for funding. Applications to the LMS should include the following:

1. A brief academic case for the visit, including a description of your current research interests, and an outline of your planned work during the visit (no more than one side of A4).
2. A brief CV (no more than one side of A4).
3. A brief budget.
4. A letter of invitation from the host department in Russia, which must state explicitly that your accommodation and subsistence expenses will be met by them. This should include provisional dates for the visit.

Financial and academic reports will be required after the visit. In exceptional circumstances, applications may be considered from strong research students who are close to finishing their doctorates. Applications should include a strong case and the student should obtain a letter of recommendation from his/her supervisor.

Visits to Britain
Under this Scheme, applications may also be made by any mathematician in Britain wishing to host a visit by a young Russian postdoctoral mathematician who wishes to spend a few weeks in Britain giving a series of survey lectures on the work of their Russian seminar. The LMS is offering grants to the host institution to meet the visitor’s actual travel and accommodation costs of up to £1,500. Applications should include the following:

1. Name and brief CV of the visitor.
2. A brief description of the course of lectures.
3. A letter or email of agreement from the head of the host department, including the proposed dates of the visit.

Financial and academic reports will be required after the visit. Further details of the Scheme can be found at www.lms.ac.uk/content/inter-national-grants#YBR. Applications received by 31 January 2013 will be considered at a meeting in February. Enquiries should be made to the Grants Administrators: Sylvia Daly, Elizabeth Fisher and Barbara Graczyk (tel: 020 7291 9971 / 3, and 0207 927 0808, email: grants@lms.ac.uk).

BRITISH APPLIED MATHEMATICS COLLOQUIUM 2013
University of Leeds - 9-12 April 2013

Plenary speakers:
• Douglas Arnold (University of Minnesota)  
The fundamental theorem of numerical analysis  
• John Bush (MIT)  
Hydrodynamic quantum analogues: Droplets walking on the impossible pilot wave  
• Marie Farge (Ecole Normale Supérieure, Paris)  
D’Alembert’s paradox and the resistance of fluid flows in the fully-developed turbulent regime: still an open problem  
• Angela McLean (University of Oxford)  
How fast does HIV evolve?  
• Alan Newell (University of Arizona)  
Phyllostaxis as a pattern forming front  
• Nick Trefethen (University of Oxford)  
The exponentially convergent trapezoid rule

Public Lecture
Eric Priest (University of St Andrews) Applying mathematics to our sun

For further information, including registration visit www.maths.leeds.ac.uk/BAMC2013. The colloquium is supported by an LMS Conference grant.
LONG-STANDING MEMBERS

The following is a list of mathematicians who have completed fifty years or more of membership of the London Mathematical Society, with their date of election.

<table>
<thead>
<tr>
<th>Date</th>
<th>Name</th>
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<tbody>
<tr>
<td>17 Mar 1943</td>
<td>Dyson, F.J.</td>
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<td>15 Jun 1944</td>
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<td>25 Jan 1945</td>
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<td>Huppert, E.L.</td>
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<td>Hayman, W.K.</td>
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SOCIETY PRIZES DEADLINE

Readers are reminded that the deadline for receipt of nominations for the 2013 Society Prizes is Friday 18 January 2013. Prizes available in 2013 include the De Morgan Medal, Senior Whitehead Prize, Naylor Prize and Lectureship, Berwick Prize and up to four Whitehead Prizes. A nomination form can be downloaded from www.lms.ac.uk/content/nominations-lms-prizes. For full details of all these prizes please see the Society’s November and December Newsletter or email prizes@lms.ac.uk.
Further to article in the October Newsletter (No. 418), the Society is pleased to announce that there are now 49 LMS representatives at institutions across the UK. An updated list of the current representatives and their institutions is given below:

If there is no representative listed for your institution please contact membership@lms.ac.uk. It is our aim to have representatives at every higher educational institution in the UK. It is essential that your representatives on Council are kept aware of the challenges and opportunities facing mathematics in the UK so that they can reflect your views accurately.

Although the majority of LMS members are pure mathematicians, the Society exists to serve all branches of mathematics – pure, applied and applicable - and our current representatives have a similar wide range of research interests.

The Role of the LMS Representative

Membership
- Encourage membership
- Act as proposer/seconder and assist in finding a proposer/seconder
- Encourage local members to vote in the annual LMS Elections

Grants
- Act as a local contact for the LMS
- Promote LMS grants to colleagues

Events and Activities
- Encourage attendance at Regional Meetings
- Promote LMS events and activities e.g. displaying posters, emails to colleagues

Students
- Liaise with student societies
- Encourage membership amongst students

Working with the LMS and other LMS representatives
- Liaise with LMS Regional Representatives and the LMS Treasurer
- Work with other LMS departmental representatives
- Attend an annual LMS Representatives Meeting at De Morgan House
- Regular liaison with De Morgan House, requesting support where needed
- Produce an annual report for the LMS
Professor Stephen A. Book, who was elected a member of the London Mathematical Society on 16 November 1972, died on 10 January 2012 at the age of 70.

Charlie Hopkins writes: Steve earned his PhD in mathematics, with a concentration in probability and statistics, at the University of Oregon. He was a professor of Mathematics at California State University, Dominguez Hills for 10 years during which he published numerous articles, among them the popularly referenced article on the formulation of sample standard deviation, before joining The Aerospace Corporation in 1980. There he worked on a wide variety of Air Force programs and directed a vigorous program of research analysis into methods of conducting cost and schedule risk analyses and deriving cost estimating relationships (CERs). He went on to receive both lifetime achievement awards to ISPA's Freiman Award for Lifetime Excellence with several Master Teaching Awards, and in 1991 was honoured with Professor Emeritus. He spent his numerous sabbaticals teaching at Queen Mary, University of London. He was also a Canadian television personality and host of a series of mathematics quizzes on the Discovery Channel.

His area of research was linear algebra (Linear Algebra, 1975); and pioneered the area of rings and radical (Rings and Radicals, 1965). Throughout his career he worked with world-class algebraists in Canada, England and Europe. He loved mathematics and teaching, and earned a noteworthy status as an entertaining professor whose classes were worth attending even if one was not taking mathematics.

In addition to being a mathematician, Divinsky was also a master at both bridge and chess. He became a Bridge Life Master in 1972. He played for the Canadian Chess Team in 1954 in Amsterdam and in 1966 in Havana. He also served as captain for two Chess Olympiads. He founded and edited the Canadian Chess Chat magazine and authored many books on the game. He also played a major role in Canada’s chess world. He was Canada’s representative to FIDE from 1987-1994 and was inducted into the Chess Hall of Fame in 2001. You can view his games at www.chessgames.com/perl/chessplayer?pid=80128.

He is survived by his wife, two daughters and two granddaughters. He lived his life with passionate curiosity and conviction and was a true linearly independent vector.

Professor Trevor West, emeritus Fellow of Trinity College Dublin, who had been a member of the London Mathematical Society from 1964 to 2004, died on 30 October 2012, aged 74.

Richard Timoney writes: Trevor got his PhD in 1964 at Cambridge under the direction of Frank Smithies with a thesis entitled Riesz operators in Banach spaces, in which he established the ‘West decomposition’ for the Hilbert space case, and he worked throughout his career on related topics including spectral theory on Banach algebras.

He had a rather extensive research collaboration with Rien Kaashoek of Amsterdam on topics related to semi-algebras and semigroups, leading to a monograph published in 1974. He also collaborated with Alastair Gillespie a number of times, with the late Gerard Murphy, with his student Roger Smyth and with Tom Laffey, amongst others. A second monograph with Bruce Barnes, Murphy and Smyth (entitled Riesz and Fredholm Theory in Banach Algebras) appeared in 1982.

Overall, Trevor was very active in Irish mathematical life and availed of his wide network of mathematical correspondents (some from his days at Cambridge, Glasgow and UCLA) to organise a number of conferences, including a joint meeting of the Irish Mathematical Society and the LMS in 1986 where the speakers were E.C. Lance (Leeds), R.G. Douglas (Stonybrook), W.B. Arveson (Berkeley) and A. Connes (Paris). As a member of the Royal Irish Academy, he took a leading rôle in its mathematical publications, changing the format to be that of a journal, and he also organised some of his major conferences under its auspices.

Trevor was deeply interested in sport since his school days at Midleton College, Cork, where his father was Headmaster for several decades, and Trevor himself became Chairman of the Board of that school. He is survived by his wife Maura Lee and will be remembered for his very positive attitude to all that he did: mathematics, politics, sport and writing.
LONDON MATHEMATICAL SOCIETY

MARY CARTWRIGHT LECTURE AND SOCIETY MEETING

Friday 1 March 2013
De Morgan House, 57-58 Russell Square, London WC1B
(Nearest tube: Russell Square)

Programme:

3.30 Opening of the meeting
   Jeff Lagarias (University of Michigan)
   From ABC to XYZ

4.30 Tea

5.00 Mary Cartwright Lecture
   Margaret Wright
   (Courant Institute, New York University)
   A Mathematical Journey
   in Non-Derivative Optimization

To register, please contact Elizabeth Fisher/Katy Henderson (womeninmaths@lms.ac.uk) by Friday 22 February. Late registrations for places may be still be accepted, subject to availability.

The reception will be followed by a dinner at the DoubleTree by Hilton London West End, at a cost of £35 per person, inclusive of wine. If you would like to attend the dinner, please contact Elizabeth Fisher/Katy Henderson (womeninmaths@lms.ac.uk) by Friday 22 February.

There are limited funds available to contribute in part to the expenses of members of the Society or research students to attend the meeting. Please contact Elizabeth Fisher/Katy Henderson (womeninmaths@lms.ac.uk) for further information.

Margaret Wright
Mary Cartwright Lecturer 2013
Call for Nominations 2013

Nominations for the 2013 award of the Ramanujan Prize for Young Mathematicians from Developing Countries are now sought. The prize winner must be less than 45 years of age on 31 December of the year of the award, and have conducted outstanding research in a developing country. Researchers working in any branch of the mathematical sciences are eligible. The prize is usually awarded to one person, but may be shared equally among recipients who have contributed to the same body of work. The prize carries a £15,000 cash award.

The deadline for receipt of nominations is 1 February 2013. Send nominations to math@ictp.it describing the work of the nominee in adequate detail. Nominations should include a cv and a list of publications, as well as a letter of recommendation. Additional supporting letters are encouraged. Self-nominations are strongly discouraged. For further information visit the website at www.ictp.it/about-ictp/prizes-awards/the-ramanujan-prize.aspx.

MATHEMATICS POLICY ROUND-UP

December 2012

Economic impact report

Working in partnership with the Council for the Mathematical Sciences (CMS), EPSRC commissioned an independent study into the economic impact of mathematical sciences research on the UK economy. The report – Mathematical sciences research: Leading the way to UK economic growth – was produced by Deloitte and is the first of its kind. It reflects the excellence of the UK mathematics research base that has generated a range of impressive and far-reaching impacts. The report is available at http://tinyurl.com/cab6ex8.

Chancellor’s support for science

George Osborne, Chancellor of the Exchequer, spoke at the Royal Society recently of ‘both his belief in the value of science as a driver of the UK economy and his commitment to science funding into the future’. A transcript of the speech is available at www.hm-treasury.gov.uk/speech_chx_091112.htm.

RESEARCH

Higher education

Lords not satisfied with government response to STEM subjects report

In July the House of Lords Science and Technology Sub-Committee I published its report on Higher Education in Science, Technology, Engineering and Mathematics (STEM) subjects (http://tinyurl.com/cbunh9n). As part of the consultation process the Council for the Mathematical Sciences (CMS) submitted evidence, which is available at http://tinyurl.com/cqovac.

The government has now responded to the report and the Lords Committee is not satisfied with the government’s response http://tinyurl.com/cvhktzu.

Mathematics is mentioned specifically in the following context: Government has not proposed sufficient action to ensure that those entering STEM higher education have an adequate level of mathematical understanding to meet their needs. Given the importance of mathematics to those studying STEM at university, the poor performance of the UK in international mathematics education league tables, and the concerns from universities about the lack of maths skills of new students, it is disappointing that Government is not doing more to lead and facilitate the process in collaboration with Higher Education Institutions (HEIs) and others. Instead they seem to be relinquishing responsibilities completely.

SCHOOLS AND COLLEGES

CBI calls for overhaul of the school system

The CBI is calling for a radical shake up of schools from nursery to sixth form to ensure all young people achieve their potential. In a new report, the CBI warns the education system fosters a culture of the average; too often failing to stretch the most able or support those that need most help. First steps: a new approach for our schools outlines possible measures to address this. They include: giving more freedom to teachers; moving the focus from league tables to delivering a more rounded education; a shift from GCSEs to make the focus of secondary education; and introducing vocational A-levels with the same standing as traditional A-levels. The full report is available at www.cbi.org.uk/campaigns/education-campaign-ambition-for-all/

Ofqual announces changes to A-levels

Ofqual has announced that A-level changes will come into force from September 2013. There will be no January exams for students whether they are in their first or second year of A-level studies. Therefore, students who started a two-year course in September 2012 will not have the option of January exams in their second year.

From September 2013 students in England will no longer be able to sit A-level exams in January, after the proposal received strong support following a three month consultation into A-level reform. The change will also address recent concerns over how many times students can sit their exams by reducing resit opportunities. More information is available at www.ofqual.gov.uk/news/ofqual-announces-changes-to-a-levels/

Education Committee - Second Special Report

In July 2012 the Education Select Committee published its First Report on The administration of examinations for 15-19 year olds in England. Responses have now been received from the government and Ofqual and these are published in a Second Special Report. The full report is available at http://tinyurl.com/9lycouc.

OTHER

The Importance of Physics to the UK Economy

This report, published by the Institute of Physics, analyses the contributions of businesses that depend on physics. The full report is available at www.iop.org/publications/iop2012/file_38713.pdf.

VISIT OF IBIHIM IDRIS

Dr Ibrahim Idris (Bayero University, Kano, Nigeria) will be visiting University of Exeter from 1 February to 31 March 2013, to perform joint work with Professor Biktashev on the problem of initiation of excitation waves. For further information, contact Professor Vadim Biktashev, University of Exeter (v.n.biktashev@exeter.ac.uk). The visit is supported by an LMS Scheme 5 grant.
VISIT OF SERGEY DOBROKHOTOV

Professor Sergey Dobrokhotov (A. Ishlinskii Institute for Problems in Mechanics of Russian Academy of Sciences) will be visiting the UK during February 2013. His main research interests are asymptotic methods and adiabatic approximations in various problems of mathematics and mathematical physics. He will deliver the following lectures:

- Loughborough University, Department of Mathematical Sciences, Friday 15 February: *Focal points in linear and nonlinear wave equation with degenerating velocity*; contact Anatoly Neishtadt (A.Neishtadt@lboro.ac.uk)
- Imperial College, London, Department of Mathematics, Tuesday 19 February: *Asymptotics for waves and vortices with small amplitudes on the shallow water created by localised sources*; contact Dimitry Turaev (d.turaev@imperial.ac.uk)
- University of Bristol, Department of Physics, Wednesday 20 February: *Beams dynamics and Lagrangian manifolds*; contact Olga Sikora (Olga.Sikora@bristol.ac.uk)
- University of Bristol, Department of Mathematics, Friday 22 February: *Explicit asymptotics for waves and vortices on the shallow water created by spatially localised sources with small amplitudes*; contact Nina Snath (n.c.snath@bristol.ac.uk)
- Warwick University, Mathematics Institute, Tuesday 26 February: *Librations, normal forms and tunnelling in quantum double wells with magnetic field*; contact Vassili Gelfreich (V.Gelfreykh@warwick.ac.uk)
- Loughborough University, Department of Mathematical Sciences, Wednesday 27 February: *Pseudodifferential operators in homogenisation problems*; contact Alexander Veselov (A.P.Veselov@lboro.ac.uk)

For further information contact Anatoly Neishtadt, Loughborough University (A.Neishtadt@lboro.ac.uk). The visit is supported by an LMS Scheme 2 grant.

UCL GEOMETRY AND TOPOLOGY DAYS

The Department of Mathematics at University College London (UCL) has recently made new appointments in geometry and topology, which have resulted in the creation of a new research group. To help celebrate this development, UCL will host two half-day events: the theme of the first meeting on 20 February 2013 will be differential geometry and the second meeting on 20 March 2013 will focus on symplectic and contact topology. The speakers will be:

- 20 February:
  - Olivier Biquard (ENS Paris)
  - Jason Lotay (UCL)
  - Michael Singer (UCL)
- 20 March:
  - Johnny Evans (UCL)
  - Hansjörg Geiges (Universität Köln)
  - Chris Wendl (UCL)

The meetings are open to everyone and each event will be followed by a reception and a dinner to which all are welcome. Updated information will be provided on the website [www.homepages.ucl.ac.uk/~ucahjde/geometry/geom-topol-days.htm](http://www.homepages.ucl.ac.uk/~ucahjde/geometry/geom-topol-days.htm). To register your interest in attending the events or for any enquiries email Jason Lotay (j.lotay@ucl.ac.uk). The meetings are supported by an LMS Conference grant.

EXPERIENCES OF LEARNING PROGRAMMING WITHIN A MATHEMATICS COURSE

Monday 4 February 2013, University of Bath

At the University of Bath, first year students in Mathematical Sciences learn both discrete mathematics and computer programming in Matlab, within a single, team-taught course. This workshop will provide the opportunity to hear from lecturers and tutors about the approach adopted and to gain further insight from students who will be available to talk about their learning experiences of the course. During the workshop attendees will be invited to participate in a discussion session and share their own experiences of including computer programming in Mathematics courses.

This workshop is funded by the Mathematics, Statistics and Operational Research discipline (www.heacademy.ac.uk/disciplines/maths-stats-stat-or ) at the Higher Education Academy (HEA), through the HEA Workshop and Seminar Series. As such there is no charge for attending this event.

For further information and to book a place please go to [www.heacademy.ac.uk/events/detail/2013/4_Feb_MSOR_Bath](http://www.heacademy.ac.uk/events/detail/2013/4_Feb_MSOR_Bath). Queries about this event should be emailed to Catherine Redfern (Catherine.Redfern@heacademy.ac.uk).

GEOMETRIC AND TOPOLOGICAL GRAPH THEORY

This five-day workshop focuses on geometric and topological problems related to graph theory. Expected topics will include topological graph theory, topological design theory, rigidity theory and other geometric structures. The workshop will feature both invited speakers and contributed talks from participants. It will take place from 15 to 19 April 2013 at the School of Mathematics, University of Bristol. The provisionally confirmed invited speakers are:

- Dan Archdeacon (Vermont)
- Robert Connelly (Cornell)
- Mark Ellingham (Vanderbilt)
- Mike Grannell (Open University)
- Terry Griggs (Open University)
- Bill Jackson (Queen Mary)
- Tibor Jordán (Eötvös Loránd)
- Bojan Mohar (Simon Fraser)
- Mathew Penrose (Bath)
- Stephen Power (Lancaster)
- Konrad Swanepoel (LSE)
- Walter Whiteley (York)

There will be a £50 registration fee for participants (waived for postgraduate students). Funding is available for postgraduate students.

**Deadlines:**

- student funding requests: 18 January; abstract submission: 15 February; registration deadline: 15 March.

This workshop is funded by the Heilbronn Institute for Mathematical Research and postgraduate student support is provided by the London Mathematical Society. The organisers are: Tom McCourt and Tony Nixon. Further information and registration forms are available at [www.maths.bris.ac.uk/~maakn/GTGT2013](http://www.maths.bris.ac.uk/~maakn/GTGT2013).
HYPERBOLIC EQUATIONS

A one-day workshop on Hyperbolic equations: solvability and asymptotic properties will take place at the Department of Mathematical Sciences at Loughborough University on Wednesday 13 February 2013. The main objectives of the meeting are to:

- provide an overview on the recent research on hyperbolic equations
- stimulate discussions and inspire future collaborations within the department
- suggest open problems and future lines of research for potential PhD students

Three lectures on different aspects of hyperbolic PDEs (solvability for equations and systems in case of multiple characteristics, qualitative behavior at infinity) will be given by:

- Claudia Garetto (Loughborough)
- Michael Ruzhansky (Imperial College London)
- Todor Gramchev (Cagliari, Italy)

The meeting will be followed by a reception. For further information contact Claudia Garetto (c.garetto@lboro.ac.uk) or visit the website http://homepages.lboro.ac.uk/~macg4/. The meeting is supported by an LMS Conference grant.

YFAW 2013 AND NBFAS

The next Young Functional Analysists’ Workshop (YFAW) will be held at the University of Sheffield from 20 to 22 March 2013. The event is aimed at postgraduate and postdoctoral researchers in functional analysis and related areas, but anybody interested in participating is welcome. The programme on each of the three days will consist of talks given by participants as well as three invited speakers:

- Paul Mitchener (Sheffield)
- Stuart White (Glasgow)
- Michael Ruzhansky (Imperial College, London) - tbc

There will be a registration fee of £25. For further information, and in order to register, visit the YFAW website at https://sites.google.com/site/yfawuk. The event is supported by an LMS Postgraduate Research Conference Scheme 8 grant.

The workshop will be followed by a meeting of the North British Functional Analysis Seminar (NBFS) in Sheffield from 22 to 23 March 2013. For further details see the NBFS website at www1.maths.leeds.ac.uk/nbfs/.

LARGE EVOLVING NETWORKS

This one day workshop will introduce the audience to a broad spectrum of work on modeling and inference for large evolving networks. It will take place on 19 March 2013 at Engineers House, The Promenade, Bristol BS8 3NB. The invited speakers include:

- Charles Bordenave (Toulouse)
- Colin Cooper (King’s College, London)
- Moez Draief (Imperial College, London)
- Nick Heard (Imperial College, London)
- Des Higham (Strathclyde)
- Gesine Reinert (Oxford)

There is no registration fee but to enable estimation of numbers, intending participants are requested to inform Alice Adams (rheinstoordirector@bristol.ac.uk). The organisers are Niall Adams, James Cruise, Dan Lawson, David Leslie and Andrew Wade. This meeting is funded by the Heilbronn Institute and organised in conjunction with the Applied Probability section of the Royal Statistical Society.

Further information and registration forms are available at: www.maths.bris.ac.uk/events/meetings/meeting/index.php?meeting_id=95.

ADVANCES IN NUMBER THEORY AND DYNAMICAL SYSTEMS

This conference will focus on connections between diophantine approximation, dynamical systems and number theory. It will take place from 8 to 12 April 2013 at the School of Chemistry, University of Bristol. The invited speakers include:

- Jon Aaronson (Tel Aviv)
- Yann Bugeaud (Strasbourg)
- Michael Derrica (TU Wien)
- Manfred Einsiedler (ETH)
- Dmitri Kleinbock (Brandeis)
- Sanju Velani (York)
- Barak Weiss (Ben Gurion)

In addition to the plenary talks there will be opportunities for a number of contributed talks.

Graduate students and recent postdoctoral whose interests are concurrent with the theme of the conference are encouraged to attend. There is funding available to support travel and accommodation expenses for graduate students and postdoctoral researchers who do not have other sources of funds.

There will be a conference dinner on the Thursday evening at 7 pm at a cost of £20. Indicate if you would like to attend the dinner, along with any dietary requirement, when registering. There is no registration fee but to enable estimation of numbers, registration is mandatory. Email one of the organizers (alan.haynes@bristol.ac.uk) or (Dave.Phillips@bristol.ac.uk) to confirm.

The conference is supported by the Heilbronn Institute for Mathematical Research. Further information is available at: www.maths.bris.ac.uk/events/meetings/meeting/index.php?meeting_id=94.

QUANTUM ALGORITHMS DAY

Following on from the success of the previous two events, the aim of this colloquium is to showcase recent research in quantum algorithms. It will take place on 25 April 2013 at Engineers House, The Promenade, Bristol BS8 3NB. The invited speakers are:

- Andrew Childs (University of Waterloo)
- Maarten van den Nest (MPI für Quantenoptik)
- Ben Reichardt (University of Southern California)
- Jérémie Roland (Université Libre de Bruxelles)
- Pawel Wocjan (University of Central Florida)

There is no conference fee but registration is mandatory. There may be limited travel support to UK PhD students who are unable to find funding from their home institutions. The organisers are Steve Brierley, Oliver Gray and Noah Linden. The conference is supported by the Heilbronn Institute for Mathematical Research (HIMR). Further information and registration forms can be found at: www.maths.bris.ac.uk/~maoww/q-alg-2013/q-alg-2013.html.
DATA ANALYSIS FOR CYBER SECURITY

The need to defend computers and networks against attack is becoming increasingly topical. While much research in this area is formal computer science, some aspects explicitly involve data analysis, including anomaly detection, dynamic graph analysis, and malware classification. It is intended to gather active academic researchers, from areas such as statistics and data mining, to describe and develop the current state-of-the-art in data-analytic aspects of network cyber security.

This workshop will take place from 25 to 26 March 2013 at Engineers House, The Promenade, Bristol BS8 3NB. Registration fees for the full workshop are: PhD students - £40, Academics - £80, Industrial - £180. Some support is available for PhD students presenting a poster.

Dinner on the Monday evening at 7 pm will be held at Bordeaux Quay. Delegates intending to attend the workshop dinner are asked to pay £25 towards its cost.

The organisers are Niall Adams and Nicholas Heard. The workshop is supported by the Heilbronn Institute for Mathematical Research (HIMR), University of Bristol. Further information and registration forms are available at: www2.imperial.ac.uk/~nadams/CC/HIMRCyberWorkshop2013.html.

CECIL KING TRAVEL SCHOLARSHIP

The London Mathematical Society annually awards a £5,000 Cecil King Travel Scholarship in Mathematics, to a young mathematician of outstanding promise. The Scholarship is awarded to support a period of study or research abroad, typically for a period of three months. Study or research in all areas of mathematics is eligible for the award.

The award is competitive and based on a written proposal describing the intended programme of study or research abroad, and the benefits to be gained from such a visit. A shortlist of applicants will be selected for an interview during which they will be expected to make a short presentation on their proposal.

Applicants should normally be nationals of the UK or Republic of Ireland, either registered for or having completed a doctoral degree within 12 months of the closing date.

Applications should be made using the form available on the Society’s website (www.lms.ac.uk/content/cecil-king-travel-scholarship) or by contacting education@lms.ac.uk. The closing date for applications is Friday 8 March 2013. It is expected that interviews will take place in London in late April or early May.

ENHANCEMENT AND PARTNERSHIP PROGRAM

The Clay Mathematics Institute invites proposals under its new program, “Enhancement and Partnership”. The aim is to enhance activities that are already planned, particularly by funding international participation. The program is broadly defined, but subject to general principles:

- CMI funding will be used in accordance with the Institute’s mission and its status as an operating foundation to enhance mathematical activities organised by or planned in partnership with other organisations.
- It will not be used to meet expenses that could be readily covered from local or national sources.
- All proposals will be judged by the CMI’s Scientific Advisory Board.

Examples include:

- Funding a distinguished international speaker at a local or regional meeting.
- Partnership in the organisation of conferences and workshops.
- Funding a short visit by a distinguished mathematician to participate in a focused topical research program at an institute or university.
- Funding international participation in summer schools (lecturers and students) or repeating a successful summer school in another country.
- Funding a special lecture at a summer school or during a research institute program.
- Funding an extension of stay in the host country or neighbouring countries of a conference speaker.

Applications will only be received from institutions or from organisers of conferences, workshops, and summer schools. In particular the CMI will not consider applications under this program from individuals for funding to attend conferences or to visit other institutions or to support their personal research in other ways.

Enquiries about eligibility should be sent to president@claymath.org. Applicants should set out in a brief letter a description of the planned activity, the way in which this could be enhanced by the CMI, the existing funding, the funds requested and the reason why they cannot be obtained from other local or national sources. Funds requested should not be out of proportion to those obtained from other sources. The CMI may request independent letters of support.

Applications should be sent to admin@claymath.org. There is no deadline, but the call will be closed when the current year’s budget has been committed.
London Mathematical Society/Nuffield Foundation Undergraduate Research Bursaries in Mathematics

Nature of Awards
The purpose of the awards is to give experience of research to undergraduates with research potential and to encourage them to consider a career in scientific research.

The awards provide support for the student at a rate of £180 per week (or £190 per week in London), for a period of between six and eight weeks.

The closing date for receipt of applications is 5 pm Friday 8 February 2013.

Eligibility
- Open to Undergraduate Students in the intermediate years (i.e. 2/3, 2/4 or 3/4) of their undergraduate degree to undertake the project during the summer vacation between their intermediate years. (Applications on behalf of first- or final-year undergraduates, or graduates, will not be considered.)
- Mature students are eligible to apply, but must not have a previous degree in any subject.
- Students must be registered at a UK institution for the majority of their undergraduate degree.
- Bursaries will not be awarded for projects that are a part of degree work, or that take place overseas for more than 50% of the project time.
- Researchers in Mathematics at universities and research institutions within the UK are eligible to apply. Interdisciplinary projects will be considered providing the project has significant mathematical content.
- Postdoctoral researchers and new lecturers, early in their careers are also encouraged to apply, and should note this on the application form.
- Only one application should be submitted by a supervisor.
- Normally no more than four awards will be made to an individual department or subject area within multidisciplinary departments or schools. Please bear in mind that this is a national scheme with a limited number of bursaries.
- Bursaries will only be granted for the student named on the application form; awards are not transferable between students.

How to apply
- Application Forms can be downloaded from the Society’s website: www.lms.ac.uk/content/grants.
- Applications must be made by the project supervisor on behalf of the student, and not the student.
- Applications should be discussed with the nominated student, who should also contribute to the project design.
- Applications should include the student’s CV and a supporting statement from his/her academic tutor.
- Applications must be signed by the Head of Department to confirm his/her approval for the award to be administered by the department. (Awards are not offered directly to individual researchers but to the institutions to which they belong).

Further information including the Guidelines on How to Apply are available from the Society website: www.lms.ac.uk/content/grants. Queries may also be addressed to Katy Henderson (urb@lms.ac.uk).

LONDON MATHEMATICAL SOCIETY
NORTHERN REGIONAL MEETING

Monday 18 March 2013

Herschel Building, Newcastle University

Programme:

2.00 pm  Opening of the meeting
Volodymyr Mazorchuk (Uppsala)

3.15 pm  Ivan Smith (Cambridge)

4.30 pm  Tea/Coffee

5.15 pm  Bernhard Keller (Paris 7)

6.30 pm  Reception and Buffet at The Penthouse

These lectures are aimed at a general mathematical audience. All interested, whether LMS members or not, are most welcome to attend this event.


The Society Meeting forms part of the workshop on Triangulations and Mutations from 18-22 March. For further details visit: www.mas.ncl.ac.uk/triangulations/index.php?p=6.

There are funds available to contribute in part to the expenses of members of the Society or research students to attend the meeting and workshop. Requests for support, including an estimate of expenses, may be addressed to the organisers (peter.jorgensen@ncl.ac.uk).
Modern nonlinear PDE methods in fluid dynamics
LMS–EPSRC Short Course
University of Reading
8-12 July 2013
Organisers: Beatrice Pelloni & Eugen Varvaruca

Course outline
The course aims to give the opportunity to a new generation of UK PhD students to attend high quality lectures on the analysis of PDE in fluid dynamics, delivered by leading international experts. The four courses are broadly divided in two strands. The first, containing the courses given by Luigi Ambrosio and Yann Brenier, deals with applications in fluid dynamics of optimal transport methods, more specifically the variational approach to the incompressible Euler equations, and the monotone rearrangement and convection theory for the Navier-Stokes and semi-geostrophic equations. The second, containing the courses of Adrian Constantin and Georg Weiss, deals with methods specific to free-boundary problems in fluid dynamics, addressing respectively the bifurcation theory approach to existence of large-amplitude steady water waves with vorticity, and the use of blow-up techniques in the study of regularity and behaviour at singularities in free boundaries.

The four main lecture course topics are:

- Variational models for incompressible Euler equations (Luigi Ambrosio, Scuola Normale Superiore, Pisa)
- Monotone rearrangement and convection theory (Yann Brenier, University of Nice)
- Bifurcation theory in the context of steady water waves (Adrian Constantin, King’s College, London)
- Analysis of singularities in free-boundary problems (Georg Weiss, Heinrich Heine University, Düsseldorf)

Guest lectures will be given by Mike Cullen (Met Office) and Camillo De Lelis (University of Zürich).

For further information please visit: www.reading.ac.uk/maths-and-stats/news/LMS-EPSRC-Shortcourse-Reading.aspx

Applications: Applications should be made using the registration form available via the Society’s website at: www.lms.ac.uk/content/short-instructional-courses. Research students, post-docs and those working in industry are invited to apply.

The closing date for applications is Monday 27 May 2013. Numbers will be limited and those interested are advised to make an early application.

*All applicants will be contacted within two weeks after the deadline; information about individual applications will not be available before then*

*In the event of over-subscription preference will be given to UK-based research students*

**Fees**

All research students registered at a UK university will be charged a registration fee of £100. There will be no charge for subsistence costs.

UK-based postdocs will be charged a registration fee of £250, plus half the subsistence costs (£140) £390 in total.

All others (overseas students and postdocs, those working in industry) will be charged a registration fee of £250 plus the full subsistence costs (£280) £530 in total.

All participants must pay their own travel costs (for EPSRC funded students, this should be covered by their DTA). Fees are not payable until a place on the course is offered but will be due by Friday 28 June.

LMS–EPSRC Short Courses aim to provide training for postgraduate students in core areas of mathematics. Part of their success is the opportunity for students to meet other students working in related areas as well as the chance to meet a number of leading experts in the topic.
LIQUID CRYSTAL DEFECTS AND THEIR GEOMETRY, ACTIVE AND SOLID LIQUID CRYSTALS, AND RELATED SYSTEMS

24 - 28 June 2013

in association with the Newton Institute programme

The Mathematics of Liquid Crystals

(7 January – 5 July 2013)

Workshop organisers: Oleg Lavrentovich (Kent State University), Tom Lubensky (University of Pennsylvania), Antonio de Simone (SISSA) and Mark Warner University of Cambridge.

Typically described by their well-ordered structures, liquid crystal phases were first identified and even named by their topological defects. The rich interplay between geometry, topology, and optics is ubiquitous through all liquid crystals. We will discuss their characterisation, and also their essential appearance in complex systems such as colloidal liquid crystals and in blue phases. Their exploitation in templating complex structures and their special character in non-simple spaces (such as those with Gaussian curvature) will also be examined. In parallel, the workshop is concerned with solid liquid crystals, both elastomers where the director remains mobile, and glasses where the director is pinned to the material frame. The unique mechanics of solid liquid crystals, and its connection with techniques of quasi-convexification first exploited in Martensites, is an active area of research. Mechanics connects with the defects theme since topological defects in LC solids, on illumination or temperature change, cause changes in Gaussian curvature or topology. These consequences, and those when nematics become active will also be explored.

This workshop will bring together experts in all the above fields, to compare and contrast the various them, to discuss topical and future problems and methods of their solution, and to explore possible applications.

Further information and application forms are available from the website at www.newton.ac.uk/programmes/MLC/mlcw04.shtml.

Closing date of the receipt of applications is 28 February 2013.
RECORDS OF PROCEEDINGS
AT LMS MEETINGS

ANNUAL GENERAL MEETING AND SOCIETY MEETING OF
THE LONDON MATHEMATICAL SOCIETY

held on Friday 16 November 2012 at the Institute of Education, London. About 80 members and visitors were present for all or part of the meeting.

The meeting began at 3:00 pm, with the President, Dr Graeme Segal, FRS, in the Chair. Members who had not yet voted were invited to hand their ballot papers to the Scrutineer, Professor Peter Saunders.

The Vice-President Professor Ken Brown presented a report on the Society’s activities and the President invited questions.

The Treasurer, Professor Robert Curtis, presented his report on the Society’s finances during the 2011/12 financial year and the President invited questions.

Copies of the Trustees Report for 2011/12 were made available and the President invited members to adopt the Trustees Report for 2011/12 by a show of hands. The Trustees Report for 2011/12 was adopted.

The President proposed Messrs Kingston Smith be re-appointed as auditors for 2012/13 and invited members to approve the re-appointment by a show of hands. Messrs Kingston Smith were re-appointed as auditors for 2012/13.

Details of the proposed changes to the By-laws with respect to the role of the Librarian (By-laws I.5, XII.3 and III.1 and a new By-law I.6) had been made available to members prior to the Annual General Meeting.

The President invited members to vote to pass these resolutions. Professor Alexandre Borovik objected on the grounds that he considered that the preparation for the meeting had been in violation of Statutes 35, 36 and 37. He also stated that he had three proxy votes. These were duly counted. Members were asked to vote by a show of hands and the count was undertaken by the Scrutineer, Professor Saunders. The resolution was passed by more than a two-thirds majority.

Details of the proposed changes to the By-laws with respect to direct nominations for LMS Elections, (By-laws II.2 and II.7) had been made available to members prior to the Annual General Meeting.

The President invited members to vote to pass these resolutions. Members were asked to vote by a show of hands and the count was undertaken by the Scrutineer, Professor Saunders. The resolution was passed by more than a two-thirds majority.

One member, Dr A.E.L. Davis, proposed one further item of business with respect to the care of the Special Collections. As 21 days’ notice had not been given for this item, it was agreed the matter would be taken under consideration and may be presented to the Council of the Society at its next meeting.

The President, on Council’s behalf, presented certificates to the 2012 Society Prize-winners:

Pólya Prize: Professor Dan Segal;
Fröhlich Prize: Professor Trevor Wooley, FRS;
Whitehead Prizes: Dr Eugen Varvaruca, Dr Sarah Waters and Professor Andreas Winter.

Thirty members were elected to Ordinary Membership: Konstantin Ardakov, David Bevan, Stephen Connor, Rama Cont, Anthony Deblin, Sebastian Del Bano Rollin, Michael Duff, Tania Dunning, Qendrim Gashi, Agelos Georgakopoulos, Richard Hepworth, Milena Hering, David Hughes, Naotaka Ikeda, Minhyong Kim, Jorj Kowszun, Sara Lombardo, Deljoo Mahdmina, Iain Moffatt, Alexeys Pichugin, Oleg Pikhurko, Martin Rasmussen, Lucia Scardia, Nadia Sidorova, Michael Smyth, Bogdan Stefanski, Kellogg Stelle, Marco Thiel, Samireh Vahid, Henry Wilton.

Twelve people were elected to Associate Membership: Suheer Saady Alwan, Alex Bailey, Andrew Barwell, Ruth Bauwens, Rosanna Cretney, Alan Logan, Paul Morris, Emilio Pierro, Ralf Rueckriemen, Daniel Rust, David Jonathan Sixsmith, James Walton.

After tea, Professor Saunders announced the results of the ballot. The following Officers and Members of the Council were elected:

President: Graeme Segal;
Vice-Presidents: Ken Brown, John Greenlees;
Treasurer: Robert Curtis;
General Secretary: Stephen Huggett;
Publications Secretary: John Jones;
Programme Secretary: Robert Wilson;
Education Secretary: Alice Rogers;
Members-at-Large of Council (for 2 year terms): Catherine Hobbs, Beatrice Pelloni, Colva Roney-Dougal, Michael Singer, Ulrike Tillmann, Alexander Veselov;
Member-at-Large of Council (for one-year term): Francis Clarke.

Five Members-at-Large who were elected for two years in 2011 have a year left to serve: June Barrow-Green, Simon Donaldson, John Hunton, Ari Laptev, Elizabeth Mansfield.

The following were elected to the Nominating Committee: Keith Ball, Gavin Brown, David Tranah.

Professor J. Bryce McLeod, FRS, winner of the 2011 Naylor Prize and Lectureship in Applied Mathematics gave the Naylor Lecture on The wedge entry problem.

After the meeting, a reception was held at De Morgan House, followed by the Annual Dinner, which was held at the Russell Hotel and attended by 80 people.
LMS AGM
16 November 2012

LMS President: Dr Graeme Segal, FRS

Polya Prize: Professor Dan Segal

Frohlich Prize: Professor Trevor Wooley, FRS

Whitehead Prize: Dr Eugen Varvaruca

Whitehead Prize: Dr Sarah Waters

Whitehead Prize: Professor Andreas Winter

LMS NEWSLETTER
http://newsletter.lms.ac.uk

GRADUATE STUDENT MEETING 2012

Report

The LMS Graduate Student Meeting 2012 took place in association with the LMS AGM on 16 November at the Jeffrey Hall, Institute of Education, London. After an initial reception for the 20 students in attendance, the chair of the meeting, Professor Ari Laptev, introduced the first speaker. In his talk, Professor Sebastian van Strien from Imperial College London presented *A survey on dynamics in dimension one*. He gave an interesting insight into results related to the ‘closing lemma’ going back to Poincaré and Fatou.

Following this, seven graduate students from various universities around the UK presented their research in a series of short talks. To begin with, Andrea Fanelli (Imperial College London) gave a talk titled *Introduction to Birational algebraic geometry: classification problem and minimal model program* providing an overview of recent results in this field.

Lukas Schimmer (Imperial College London) presented an application of the commutation method in *A simple proof for sharp Lieb-Thirring inequalities* based on work by R. Benguria and M. Loss.

In her talk *Centroid-based initialized JADE for global optimization*, Rashida Adeeb Khanum (University of Essex) showed that the performance of JADE, an adaptive version of nature inspired algorithm DE, can be improved further by changing its random population initialization with centroid based population initialization.

Tomasz Tkocz’s (University of Warwick) presentation *My favourite inequality* provided a proof of the remarkable fact that for spheres in high dimensions almost all mass is concentrated around any equator.

Barinder Banwait (University of Warwick) gave an insight into an important aspect of number theory, the so-called local-to-global question, in his talk titled *Local to global phenomena in number theory*. Marina Iliopoulou (University of Edinburgh) presented Algebraic methods for the solution of combinatorial and analytical problems, demonstrating the use of innovative algebraic methods for the solution of the joints problem.

The last student talk was given by Sara Tavares (University of Nottingham), who provided an introduction to background field theory in *What is BF theory anyway?*.

Tomasz Tkocz and Marina Iliopoulou were awarded prizes in recognition of their outstanding presentations.

Afterwards LMS publisher Susan Hezlet presented a concise overview of the process of publishing scientific work in her talk *How to get your papers published*, from the choice of a journal to the submission of the final version of the paper. To close the Graduate Student meeting, Professor Adrian Constantin from King’s College London and University of Vienna presented *Particle trajectories beneath irrotational travelling water waves*, in which he considered travelling waves moving at the surface of water and described the pattern of the particles beneath the wave.

Later the LMS Annual General Meeting took place in the same location, and is reported in the ‘Records of Proceedings’ in this Newsletter.

Tomasz Tkocz and Marina Iliopoulou were awarded prizes in recognition of their outstanding presentations.

REVIEWS

THE TRAVELLING SALESMAN – P VS NP

It is a refreshing idea to set a thriller in the world of mathematics and mathematicians – to put a theorem at the heart of the conflict in a film. Not surprisingly, in *The Travelling Salesman*, directed by Timothy Lanzone and written by Andrew and Timothy Lanzone, the tension is due not to the intricacies of the proof, but rather to the moral issues arising from the possible uses of the theorem. In this case the theorem is P=NP, which all mathematicians except a handful of lunatics expect to be false. As it happens, I am one of these lunatics: in fact, almost thirty years ago, Charles Read and I even had a dinner to celebrate our
people outside academia; here are just three examples. After four years of collaboration, one of the mathematicians addresses another as ‘Dr’, to which he gets the retort ‘Professor’. To give weight to his arguments, one of the characters says ‘I also have a Wolf Prize and an Abel Prize’. Congreve’s line is turned into ‘Hell hath no fury like a mathematician scorned.’


The nature of science is that it seldom soars as rapidly as its advocates wish. The standard model of subatomic particles is no exception; it was preceded by a brief lecture to mathematicians: four mathematicians, of whom only one is older, gather around a table to wait for a fifth man, and soon get into a heated discussion of the implications of their recent phenomenal result: the solution that P=NP belongs to the four of us. You can have the design for the processor classified if you want, but P=NP is an algorithm, as original promised is ours’, and the action proceeds to an unexpected and unlikely conclusion.

A rather important question remains: at whom is the movie aimed? Is it for the general public or mathematicians? At the UK premiere of this film at the Centre for Mathematical Sciences in Cambridge, the screening was preceded by a brief lecture to mathematicians about the P vs NP problem. The lecturer mentioned that this problem was one of the seven Millennium Problems, and made the outrageous claim that a proof of P=NP will be rewarded by 6 million dollars, as it will lead to instant proofs of the other remaining open problems, including the Riemann Hypothesis and the Birch and Swinnerton-Dyer Conjecture. If this is the view of an expert mathematician, what chance do members of the general public have to make head or tail of the problem and its implications? As one would expect, many things jar in the story of the search for the Higgs boson; Higgs Force came out just months before the announcement of its likely discovery.

The standard model states that the world is made out of a just a few types of elementary particles. For example, atoms consist of electrons, up-quarks and down-quarks). The job of most other particles is to hold the atom together, mediating the forces of attraction. A few more show up as results of various collisions and transformations. Quite apart from this particle stew stands the final constituent of the standard model: the Higgs boson. It is the only unconfirmed component of a generally very successful theory. This alone would not explain the gigantic international efforts to find the Higgs boson; the extra motivation comes from the structure of the standard model. Should it turn out that the Higgs boson does not exist, the entire theory falls. For example, this particle is essential for understanding why atomic particles have mass.

The author describes a repeating pattern in the progress of science. Over the course of several investigations, the number of known elementary building blocks has increased. Human nature, however, dictates that the true, beautiful theory of the universe should include only a small number of building blocks. Once there are hundreds of them, we start to feel that these building blocks are not elementary after all, and their abundance is explained by being combinations of a small number of more essential building blocks. This new explanation comes from noticing a pattern or symmetry. For example, when the number of known chemical elements became uncomfortably large, a regular pattern was observed in them (the periodic table), and this eventually led to the discovery that the elements are just combinations of electrons, protons and neutrons. Then history repeated itself. It was discovered that there are in fact many more elementary particles, leading to the idea that the “elementary” particles are not elementary after all; their building blocks turned out to be quarks. The standard model now contains a rather large number of par-
articles: perhaps we are at the beginning of another such cycle, although an announce-
ment of the possible observation of the Higgs boson came from CERN just months after this book was published.

The book is written in a simple and engaging style, and the author chooses the level of complexity well for a general audience. Inexplicable transitions do occur, however. For example, the author consistently refers to interactions as forces (except briefly chapter 5). Most of the time it is a reason-
table for the reader understand, for example, the

of complexity well for a general audience.

These minor shortcomings are greatly out-
weighed by the overall excellence of the ma-
terial and presentation. Higgs Force will be of interest to anyone interested in physics, as well as to those physicists whose area of ex-
pertise is not particle physics.

Ilia Rushkin

A version of this review was first published in Plus magazine (http://plus.maths.org).

CALENDAR OF EVENTS

This calendar lists Society meetings and other mathematical events. Further information may be obtained from the appropriate LMS Newsletter whose number is given in brackets. A fuller list is given on the Socie-
ty’s website (www.lms.ac.uk/content/calendar). Please send updates and corrections to calendar@lms.ac.uk.

JANUARY 2013

7 Analysis Day, Bristol (420)
7-11 Nonlinear Analysis UK-Japan Winter School, London (419)
7-11 Symmetry, Bifurcation and Order Parameters INI Workshop, Cambridge (418)
8-11 Statistical Mechanics and Extreme Events in Earth Science Conference, Reading (420)
16-18 British Postgraduate Model Theory Conference, Manchester (419)
22 The Queen of Mathematics, Gresham College, London (420)
30 Sheffield Probability Day, Sheffield (420)
30 Winter Combinatorics Meeting, Open University (420)

FEBRUARY 2013

4 Experiences of Learning Programming within a Mathematics Course, Bath (421)
13 Hyperbolic Equations Workshop, Loughborough (421)
19 Are Averages Typical? Gresham College, London (421)
20 Geometry and Topology Day, University College London (421)

MARCH 2013

1 LMS Mary Cartwright Lecture, London (421)
14 David Crighton Lectures, Royal Society, London (421)
18 LMS Northern Regional Meeting, Newcastle University (421)
18-22 Analytical and Computational Paths from Molecular Foundations to Continuum Descriptions Workshop, INI Cambridge (419)
18-23 Workshop on Triangulations and Mutations, Newcastle (421)
19 Modelling the World, Gresham College

MAY 2013

1-3 Mathematical Models of Biological Evolution, Leicester

JUNE 2013

5 Combinatorics One Day Meeting, Oxford (421)
10-14 LMS Invited Lecturers, Fedor Bogomolov, Edinburgh (420)
11-14 MAFELAP 2013, Brunel
17-20 Young Researchers in Mathematics 2013, Edinburgh
20-21 High-Dimensional Inference with Applications, Kent
24-28 Liquid Crystal Defects and their Geometry INI Workshop, Cambridge (421)
30-5 Jul British Combinatorial Conference, Royal Holloway College, University of London

JULY 2013

1-2 Bifurcation Theory, Numerical Linear Algebra and Applications, Bath
1-4 Dense Granular Flows 2nd IMA Conference, INI, Cambridge (416)
3-13 Polylogarithms as a Bridge between Number Theory and Particle Physics
LMS-EPSCR Durham Symposium
5 LMS Meeting, London
8-12 Modern Nonlinear PDE Methods in Fluid Dynamics, LMS-EPSCR Short Course, Reading (421)
15-19 Polynomial Optimisation Summer School and Workshop, INI, Cambridge (420)
15-25 Graph Theory and Interactions
LMS-EPSCR Durham Symposium
29-2 Aug Computational Group Theory, LMS-EPSCR Short Course, St Andrews (241)

AUGUST 2013

3-11 Groups St Andrews 2013, St Andrews (410)

SEPTEMBER 2013

2 Heilbronn Day, Groups and Their Representations, Manchester
3-6 Brauer’s Problems in Representation Theory – 50 years on, Manchester
9-13 Spectral Geometry, Chaos and Dynamics, Loughborough
11-13 Mathematics of Surfaces 14th IMA Conference, University of Birmingham (416)

15 LMS-Gresham Lecture, Peter Cameron, Museum of London (421)
LMS RECEPTION AND ANNUAL DINNER
16 November 2012

Rob Wilson and Shahkar Mossaheb
Caroline Series and Sebastian van Strien

Peter Clarkson and Nick Manton
Srishti Chatterjee and John Toland

LMS President Graeme Segal giving a speech at the Annual Dinner