GENERAL MEETING

There will be a General Meeting of the Society on Friday 29 June 2012, to be held at the Wilkins Old Refectory, University College London at 3.30 pm. The business shall be:
1) the appointment of scrutineers
2) announcement of Council’s recommendation for Election to Honorary Membership
3) announcement of prize winners for 2012

The General Meeting will be followed by the Hardy Lecture (see page 5). I hope that as many members as possible will be able to attend.

Fiona Nixon
Executive Secretary

EUROPEAN LATSiS PRiZE

The European Science Foundation (ESF) invites nominations for the European Latsis Prize 2012. The prize, of a value of 100,000 Swiss Francs, is awarded each year by the Latsis Foundation through the ESF to a scientist or research group in recognition of outstanding and innovative contributions in a selected field of research. The research field for the 2012 Prize is mathematics.

The European Latsis Prize 2012 seeks nominations for outstanding contributions to research in mathematics. Nominations are encouraged from all parts of mathematics, both pure and applied. The deadline for nominations is 15 July 2012.

For more information visit the website at www.esf.org/activities/european-latsis-prize-2012.html.

FELLOWS OF THE ROYAL SOCIETY

Amongst those elected to Fellowship of The Royal Society in 2012 were:
- Dominic David Joyce, Professor of Mathematics, Mathematical Institute, University of Oxford, and Senior Research Fellow, Lincoln College
- Richard Kerswell, Professor of Applied Mathematics, School of Mathematics, University of Bristol
- Chandrashekhar Bhalchandra Khare, Professor of Mathematics, Department of Mathematics, University of California, Los Angeles
- John Michael McNamara, Professor of Mathematics and Biology, School of Mathematics, University of Bristol

EUROPEAN WOMEN IN MATHEMATICS

European Women in Mathematics (EWM) is an international association of women working in the field of mathematics. The organization was founded in 1986 and has its office in Turku, Finland. EWM has several hundred members in over 30 European countries. Its executive consists of a convenor and a standing committee. EWM holds a biennial scientific meeting and a general conference. Recent meetings have taken place in Cambridge, UK (2007), Novi Sad, Serbia (2009) and CRM Barcelona, Spain (2011).

EWM also sponsors or co-organizes various interim meetings and other activities, for example the ICM satellite meeting ICWM 2014 in Korea. EWM is independent from, but has links to, its sister organization, the Association for Women in Mathematics (AWM) based in the United States. It also has close links to various national level organizations, for example, Femmes et Mathématiques in France.

6ECM activities
EWM is organizing the Joint EMS/EWM Survey Lectures on Sunday 1 July as a satellite to the Congress. Together with the EMS Women in Mathematics Committee, we are organizing a panel on Redressing the gender imbalance in mathematics: strategies and outcomes. Moreover, thanks to contributions from Google and the Foundation Compositio Mathematica, EWM is sponsoring the participation at the 6ECM for 20 to 30 young women who then also get to participate in the EWM satellite event on the Sunday.

Other activities
We publish an annual newsletter. Our members are connected by an e-mail network. Every second year there is a general meeting with published proceedings. EWM participates and organizes sessions in international mathematical conferences. Activities and publicity within each country are organized by regional coordinators. Each country or region is free to form its own regional or national organization, taking whatever organizational or legal form is appropriate to the local circumstances.

EWM aims
• to encourage women to study mathematics
• to support women in their careers
• to provide a meeting place for like-minded people
• to promote scientific communication
• to cooperate with groups and organizations with similar goals
• to gather and provide information on women in mathematics

Membership
Any woman who supports the purposes of the organization can become a member. The organization can have women or men, as well as organizations, as supporting members. To become a member, fill in the online registration form or contact your regional coordinator. For more information and for registration, please go to our website www.europeanwomeninmaths.org.

Lisbeth Fajstrup
EWM Deputy Convenor

WOMEN IN MATHEMATICS

Grace Chisholm Young Fellowship
The London Mathematical Society offers two Grace Chisholm Young Fellowships each year to mathematicians who need support when their mathematical career is interrupted by family responsibilities, relocation of partner, or other similar circumstance. If you, or anyone you know might find the fellowship useful, please see www.lms.ac.uk/content/grace-chisholm-young-fellowships for more information.

The following is a brief report by Veronique Fischer on how she used the fellowship.

From October 2010 until December 2011, I was the LMS Grace Chisholm Young fellow at King’s College London (KCL). I am deeply grateful to the London Mathematical Society and particularly to the Women in Mathematics Committee for giving me this opportunity to pursue my academic career in the UK while living with my partner in London. The title gave me an academic status within KCL’s mathematics department and more widely in the mathematical community in London and in the UK. It considerably eased the process of applying for grants and positions, giving seminars, networking as well as going to conferences.

The application for the Grace Chisholm Young fellowship was simple (less than two pages) and their response was quick and clear. With this fellowship, my host institute KCL has provided me with excellent research facilities including an email address, a shared office, and access to research literature online and through the KCL library. It has also given me the opportunity to teach a course at the LTCC.

The personal grant of the fellowship helped me to buy a collection of a dozen books on a new subject I was starting in the UK during my fellowship. Relying on the possibility of being reimbursed by my host institute against the grant money, I was confident to travel and register for conferences and workshops (although most of my expenses turned out to be eventually covered by the conference organisers).

In the course of the fellowship, I had three interviews: at the University of Cambridge, at Cardiff University and at the University of Padua (Italy). In January 2012 I started a postdoctoral position at the latter with the agreement that I would be able to work remotely from my home in London three weeks a month.

Retrospectively my time as the Grace Chisholm Young fellow has been academically very productive as well as personally balanced.
STELIOS ANDREADAKIS

Professor Stelios Andreadakis, who was elected a member of the London Mathematical Society on 17 March 1960, died on 9 February 2012, aged 79.

Dimitrios Varsos writes: Stelios Andreadakis was born in Athens and graduated in Mathematics from the University of Athens in 1958. He obtained his doctorate from the (then called) Queen Mary College of the University of London under the supervision of Professor Philip Higgins. He then went on to hold an academic position at the University of Athens. He became Professor of Mathematics at the University of Ioanna in 1967 and of the University of Athens in 1973, where he remained until his retirement in 2001.

Professor Andreadakis’s contribution to the theory of infinite groups and in particular to the study of the automorphism group of a free group was quite significant. He served the mathematics community by participating in the organization of two very successful international conferences: Group Theory and Related Areas in 1984 in Crete, Greece and Group Theory, Representation Theory and Related Topics in 1993 in Spetses, Greece. He was actively involved for many years in the administration of the Hellenic Mathematical Society and the Department of Mathematics of the University of Athens.

He was a very warm and caring person with a delightful sense of humour. One of his side interests was both Greek and world history in which he had great erudition. He is survived by his wife Roula, two daughters and a granddaughter.

DAVID STORVICK

Professor David A. Storvick, who was elected a member of the London Mathematical Society on 10 November 1970, died on 5 November 2011, aged 82.

Peter Olver writes: David was a distinguished member of the School of Mathematics at the University of Minnesota, and a recognized researcher in the fields of complex analysis and mathematical physics. During his career, he published 39 papers in top level research journals, many of them written with another former colleague, Robert Cameron. David’s research accomplishments led to many invitations to speak at conferences throughout the world.

David received a PhD degree in mathematics from the University of Michigan in 1956 as a student of Arthur Lohwater. After two years at Iowa State University, he joined the University of Minnesota, where he spent the rest of his career, retiring in 2004. He served as Associate Head of the School of Mathematics 1964–70, Associate Dean of the Institute of Technology 1979–83 and then again 1993–94, and as Acting Director of the Gray Fresh Water Biological Institute 1989–90.

He enjoyed three sabbaticals, during which he visited the University of Wisconsin, Imperial College, London and the University of York. He will be missed by his colleagues and friends in Minnesota and throughout the world.

MATHEMATICIANS AND THEIR GODS

The historical interaction between mathematicians and theism is rich in culture and character. This September weekend event (15 to 16 September 2012 at Rewley House, Oxford) will be made up of talks which draw from the breadth of mathematical and theological history to consider topics including the sect of the Pythagoreans (Andy Gregory, UCL); Newton’s views on the apocalypse (Rob Iliffe, University of Sussex); Edwin Abbott’s faith and Flatland (Mel Bayley, University of Kingston); and Gödel’s proof of the existence of God (Anthony Anderson, University of California).

The content of this weekend should be accessible to the intelligent layman. It is offered in conjunction with the British Society for the History of Mathematics. Further information can be found at www.conted.ox.ac.uk/O12P114MAR.

3.30 Opening of the meeting and LMS business, including the announcement of the 2012 Prize winners (open to all)

Vincent Borrelli (Lyon) Flat tori in three-dimensional space

4.45 Tea/Coffee

5.15 Étienne Ghys (CNRS, Lyon) Hardy Lecture On cutting cloth, according to Chebyshev

6.30 Reception at De Morgan House, Russell Square.

These lectures are aimed at a general mathematical audience. All interested, whether LMS members or not, are most welcome to attend this event. A reception will be held at the LMS at 6.30 pm with a dinner afterwards at the English Garden Restaurant, Grange Whitehall Hotel, Montague Square. The cost to attend the dinner will be £35 per person. Those wishing to attend the dinner should contact Elizabeth Fisher (lmsmeetings@lms.ac.uk) before 20 June.

There are funds available to contribute in part to the expenses of members of the Society or research students wishing to attend the meeting. The meeting will be preceded by a Graduate Student Meeting.

Contact Elizabeth Fisher (lmsmeetings@lms.ac.uk) for further information.
NEWS FROM ICMS

New Funding Announcement
In April, the Engineering and Physical Sciences Research Council (EPSRC) awarded a grant of £1.3 million to the International Centre for Mathematical Sciences (ICMS) in Edinburgh. Spanning four years in total, the funding will help the centre continue to attract the world’s leading researchers in mathematics and related scientific fields to the UK and to showcase British research in the mathematical sciences.

Professor David Delpy, Chief Executive of EPSRC, said “The grant will introduce young researchers to senior figures from the UK and overseas and offer crucial training opportunities. It will also help the centre to communicate new ideas and techniques to workshop participants.”

Professor Keith Ball, Scientific Director of ICMS, said “The EPSRC grant will help to nurture the next generation of mathematical scientists by encouraging the participation of young researchers in ICMS events, and to address the gender gap in mathematics by encouraging the participation of women. One of the aims is to coordinate workshops that involve scientists working in several different areas so as to enable the cross-fertilisation of ideas from one area to another.”

Knowledge Transfer and Public Engagement
The last few years have seen an expansion of ICMS’ interaction with business and industry and it continues to grow. In a typical year ICMS attracts around 500 of the world’s most talented mathematicians and other scientists to its workshops in Edinburgh. An important aim of ICMS is to facilitate knowledge transfer between mathematical scientists and organisations outside academia, so that mathematics may be widely exploited by, and bring benefits to, the widest possible community. ICMS offers industry the opportunity to participate in workshops through ‘applied sessions’ and appropriate networking events.

To enable this participation, ICMS has a dedicated Knowledge Transfer (KT) officer, Dawn Wasley, whose job is to identify potential beneficiaries within industry, commerce and the public sector, and to involve them in the Centre’s activities. In the past three years, some 50 of the world’s largest companies covering healthcare, oil, finance, defence, engine manufacture and computing have sent representatives to ICMS meetings. With access to an array of internationally renowned mathematicians, ICMS also runs a growing series of public engagement activities attached to workshops. These activities include public lectures, schools events and contributions to science festivals. For example, the recent workshop on isoperimetric problems, space-filling and soap bubble geometry gave rise to a talk for school children on Soap bubbles and mathematics, including...
a guessing contest with demonstrations, explanations and prizes, by Professor Frank Morgan, Williams College, and a public lecture Kelvin and me, by Professor Denis Weaire, Trinity College, Dublin. A public lecture by Professor Robert Ghrist, University of Pennsylvania and an exhibition of mathematically-inspired art are planned as part of the workshop Applied and computational topology (ATMCS 5) in July.

Public events are also created in-house. This spring ICMS’ communications officer Madeleine Shepherd researched and presented a walking tour Edinburgh’s Mathematical Past and Future for the Edinburgh International Science Festival. The tour was a great success and needed an extra ‘performance’ to satisfy demand.

ICMS maintains a series of databases and mailing lists to facilitate these engagement activities. If you wish to be added to these lists, contact the KT officer, Dawn Wasley (Dawn.Wasley@icms.org.uk).

21 Years of Workshops

2012 sees the twenty-first anniversary of ICMS’ first workshop. To mark the occasion ICMS celebrated with an afternoon of lectures for the mathematical community and other invited guests, followed by an evening reception. The event brought together some of ICMS’ founders, established and early-career researchers, members of the financial community and ICMS administrative staff for general networking – and fun!

The session was chaired by Professor Keith Ball, ICMS’ Scientific Director, and began with a short talk from Sir Peter Burt, Chair of the ICMS Board, on the history of the Centre. Sir Peter and Professor Ball then ceremonially cut the anniversary cake. The next speaker was Dr David Acheson, University of Oxford. His talk, What’s the problem with mathematics?, looked at solutions to the problem of engaging school pupils with mathematics. Dr Acheson showed the audience several intriguing pieces of mathematics with which to beguile students, including ‘proof by pizza’! The aforementioned cake was served with coffee between the lectures and proved to be delicious.

After the break Professor Damiano Brigo, Kings College London, spoke on Randomness and the future: mathematics and stochastic differential equations in finance. Among many other things Professor Brigo discussed how mathematics has been unjustly and superficially blamed for part of the financial crisis, highlighting some of the common misunderstandings concerning mathematical modelling work. The event concluded with a reception in the Atrium of 15 South College Street, where animated discussion and cheerful conversation continued until the building was closed for the night.

Forthcoming ICMS workshops 2012

• Scale transitions in chemistry and biology, 4–8 June
• Multiscale modelling and techniques – postgraduate conference day, 6 June
• Applied and computational topology (ATMCS 5), 2–6 July
• Cubical complexes and applications, 16–20 July
• INI satellite meeting: Tangled magnetic fields in astro- and plasma physics, 15–19 October
• Algebraic geometry, modular forms and applications to physics, 26–30 November

For full details of these and all the events visit www.icms.org.uk or email info@icms.org.uk.

FINITE GROUPS

A conference on Finite Groups and Related Topics on the occasion of John Thompson’s 80th birthday will take place at the CMS in Cambridge, starting after lunch on Thursday 27 September and ending at lunchtime on Sunday 30 September 2012. The speakers will include Aschbacher, Capdeboscq, Flavell, Glauberman, Kessar, Liebeck, Malle, Robinson, Serre, Sin, Smith, Solomon and Tiep.

The conference dinner will take place at Gonville & Caius College on Thursday 27 September. For further information and to register see the website at www.dpmms.cam.ac.uk/Seminars/Conferences/Thompson80/. There will be support available for young mathematicians attending; for this you should contact J.Saxl@dpmms.cam.ac.uk. The organisers are Bob Guralnick and Jan Saxl. The conference is supported by the DPMMS, the National Science Foundation and an LMS Conference grant.

A Mathematician’s Apology

G. H. Hardy
C. P. Snow

The apology, written in 1940, offers a brilliant and engaging account of mathematics as very much more than a science, when it was first published. Graham Greene noted that it is ‘the best account of what it was like to be a creative artist’. C. P. Snow’s foreword gives sympathetic and witty insights into Hardy’s life, with its rich store of anecdotes concerning his collaboration with the brilliant Indian mathematician Ramanujan, his eccentricities and his passion for cricket. It is a unique account of the fascination of mathematics and of one of its most compelling exponents in modern times.

March 2012 | Paperback | 9781107606456 | 274 pages | £15.99

www.cambridge.org/hardy

Circuit Double Cover of Graphs

Cun-Quan Zhang
West Virginia University

The famous Circuit Double Cover Conjecture and its numerous variants is considered one of the major open problems in graph theory owing to its close relationship with topological graph theory. Integral flow theory, graph coloring and the structure of graphs. It is easy to state: every 2-connected graph has a family of circuits covering every edge precisely twice. C-Q. Zhang provides an up-to-date overview of the subject containing all of the techniques, methods and results developed to help solve the conjecture since the first publication of the subject in the 1940s. It is a useful survey for researchers already working on the problem and a fitting introduction for thoseSet.

Series: London Mathematical Society Lecture Note Series. No. 395
April 2012 | Paperback | 9780521123202 | 75 pages | £40.00

www.cambridge.org/zheng

www.cambridge.org
Professor John Barrow, FRS, was presented with the 2012 Christopher Zeeman Medal by the Presidents of the IMA and the LMS on 21 March 2012 at The Royal Society.

The IMA President, Professor Robert MacKay, FRS, gave a brief history of the medal, which was created to recognise and acknowledge the contributions of mathematicians involved in promoting mathematics to the public and engaging with the public in mathematics in the UK. The award also demonstrates that such activities are valued by both Societies and the mathematical community at large, and are a part of a mathematician’s roles and responsibilities.

It was also a great honour to have Sir Christopher Zeeman, FRS, for whom the medal was named, and his wife Rosemary in the audience.

Dr Graeme Segal, FRS, LMS President, then read the citation for Professor John Barrow. The full citation transcript is available at www.ima.org.uk/viewitem.cfm?cit_id=383955.

The medal was presented by Professor McKay, after which Professor Barrow gave his lecture on mathematics in sport, including triathlon, football, tightrope walking, gymnastics, cycling, tennis, diving, running, rowing, and weight lifting.

This is an abridged version of a report by Rebecca Waters appearing in the June 2012 issue of Mathematics Today.
MATHEMATICS POLICY ROUND-UP

May 2012

RESEARCH
Response to EPSRC announcement
The Council for the Mathematical Sciences (CMS) responded to the recent EPSRC announcement on Shaping Capability, fellowships and peer review. The response is available at http://tinyurl.com/cl3ocx2.

HIGHER EDUCATION
Response to Higher Education Commission inquiry
The Council for the Mathematical Sciences (CMS) responded to the Higher Education Commission inquiry into Postgraduate Education. The response is available at http://tinyurl.com/caamcfI.

SCHOOLS AND COLLEGES
Mathematics within A-level science 2010 examinations
SCORE (Science Community Representing Examinations) published an analysis of the mathematical content in six other A-level subjects that require quantitative skills – business studies, computing, economics, geography, psychology and sociology. The full report is available at http://tinyurl.com/cuz7tlh.

Changes announced to the allocation of university places
Uncapped recruitment for high-achieving students will be further eased in 2013/14. The A-level threshold will lower from AAB+ to ABB+. A further 5,000 places will be allocated through a competitive core and margin to universities and colleges offering good quality and value for money. It is expected that a further 35,000 students will now join the pool of unrestricted students which universities can recruit from. In total 120,000 places, one in three, are expected to be freed up. More information is available at http://tinyurl.com/bmlhdpp.

NETHERLANDS, UTRECHT UNIVERSITY
Two Full Professorships of Mathematics (0.8 – 1.0 fte)
The Mathematical Institute of Utrecht University invites applications for two full professorships. It is anticipated that one appointment will be made in the section of Fundamental Mathematics – currently comprising algebra, analysis and geometry –, and one in the section of Mathematical Modelling – currently comprising applied analysis, stochastics and mathematics of computation. The search, however, is not limited to the listed areas and, furthermore, in case of exceptional candidates, both appointments may be made in the same section.

We are looking for outstanding candidates who will invigorate and enrich the pool of expertise in the Institute and the university at large. The Institute has a long-standing tradition of crossing borders into other scientific fields. Interdisciplinary activity includes, but is not limited to, theoretical physics, theoretical biology, and life sciences. Appointees are expected to play an active role in all aspects of academic life. Candidates should demonstrate excellence in research, including grant-earning capacity, and be skilled in teaching and student supervision. Furthermore, we expect a willingness to take up administrative responsibilities. The appointments are, in principle, permanent, at the level of full professor on a “Core Chair”. However, the Institute may offer more junior candidates of exceptional promise a “Profile Chair”, which is subject to review after a 5-year period. Utrecht University specifically encourages female candidates to apply.

Closing date for applications: 1 August 2012.
See www.math.uu.nl/jobs for a complete job description and www.math.uu.nl/facts.html for a fact sheet concerning the institute.

Education), a collaboration of leading science organisations, has published a report which analyses the type, extent and difficulty of mathematics within the 2010 A-level examination papers for the three sciences – biology, chemistry and physics. The full report is available at http://tinyurl.com/cuz7tlh.

The Nuffield Foundation has also published an analysis of the mathematical content in six other A-level subjects that require quantitative skills – business studies, computing, economics, geography, psychology and sociology. The full report is available at http://tinyurl.com/ca4hget.

The reports consider whether the type of mathematics in the examinations was suitable for progression within the subject’s field (type), the proportion of the examination that depended on mathematical knowledge (extent), and the complexity of the mathematical questions (difficulty).

Proposed A-level reforms
Ofqual has published an exchange of letters between Michael Gove MP, Secretary of State for Education, and Glenys Stacey, Ofqual’s Chief Executive, on proposed changes to A-levels.

Alongside the letters, Ofqual has also published research, which was commissioned to find out what higher education institutions, teachers and employers think about A-levels. The research aimed to find out the extent to which A-levels prepare young people for university and/or work, and identify any areas of concern. Both letters and the research findings are available at http://tinyurl.com/cd6pdSs.

Functional skills standards in mathematics
In 2011, Ofqual reviewed the specifications for 39 functional skills in mathematics qualifications across five levels and ten awarding organisations.

Ofqual has now published a report, Review of Functional Skills Standards in Mathematics, which provides a summary of the findings and details of any actions awarding organisations have carried out since the review. The report is available at http://tinyurl.com/d8hboxt.

OTHER
Women in STEM report
The Royal Society of Edinburgh has published a report entitled Tapping all our talents. Women in STEM: a strategy for Scotland. The report recommends creating a strategy to increase the proportion of women in the workplace qualified in STEM subjects, and to increase the number that rise to senior positions in universities, research institutes, government, business and industry. A statement from the LMS on Women in Mathematics is published in the report.

The report was produced by an expert working group, chaired by astrophysicist Professor Dame Jocelyn Bell Burnell. The full report is available at http://tinyurl.com/c9b7epo.

New head of POST
Dr Chris Tyler, Executive Director of the Centre for Science and Policy, University of Cambridge, became the new Head of the Parliamentary Office of Science and Technology (POST) at the end of May 2012. More information is available at www.parliament.uk/post.

Academies challenge cuts to select committee
The Royal Society, The Academy of Medical Sciences, the British Academy and The Royal Academy of Engineering have written to the Prime Minister questioning the wisdom of proposals to slash the budget of the House of Lords Science and Technology Committee. A full copy of the letter is available at http://tinyurl.com/cvq3x7l.

Dr John Johnston
Mathematics Promotion Unit
LONDON MATHEMATICAL SOCIETY

6th European Congress of Mathematics
Kraków, Poland

LMS MEETING AND RECEPTION
Tuesday 3 July 2012

The London Mathematical Society will be holding a meeting and reception during the 6th European Congress of Mathematics (6ECM) which takes place in Kraków from 2 to 7 July 2012.

The Society meeting and reception will be held from 6:30 pm to 8.00 pm on Tuesday 3 July. LMS members will have the opportunity to sign the Membership Book which dates back to 1865.

LMS members who wish to attend the meeting and reception should apply for their free ticket to Elizabeth Fisher (lmsmeetings@lms.ac.uk) no later than Friday 22 June 2012.

The Society hopes to entertain as many as possible of its members, but numbers are limited by the capacity of the room.

HE CURRICULUM INNOVATION
Supporting Sector Priorities and Fostering New Ideas

Recently, with the IMA and sigma, I presented at the HoDoMS conference on my activity in HE curriculum innovation as part of the Mathematical Sciences Strand of the National HE STEM Programme. As we have now allocated all funding under the Mathematical Sciences HE Curriculum Innovation Fund, I was pleased to be able to report some figures on its distribution. Thirty-three projects involving thirty-six institutions have been supported with around £250k of funding; 94% of funding was allocated through competitive open calls and 63% of funding has been allocated to collaborative projects.

Seventy per cent of supported projects (by funding) result from the recommendations made at the HE Mathematics Curriculum Summit (LMS Newsletter 401, March 2011, p. 9).

Allocating funding to curriculum development priorities identified by departments in this way should ensure the projects do work which is relevant and needed, and therefore provide a useful and lasting impact. Leaving a minority portion to open call ensures that we remain sensitive to innovative ideas and issues that are important but not on the radar of heads of departments.

The breakdown of funding by topic (approximate percentage of total funding) is: Engaging with employers on curriculum work & making available industrial problems (30%); Problem solving (23%); Assessment (22%); Student-centred approaches (10%); Maths Arcade (6%); Developing graduate skills (5%); Audio-visual media in teaching and learning (3%); Evaluation methods (0.5%).

Another aspect of this project during the 2010/11 and 2011/12 academic years has been running workshops and seminars. More than 30 have taken place or are planned at the time of writing, with attendees so far from 46 institutions.

Many of the supported projects will be presenting their findings at the CETL-MSOR Conference (12–13 July, University of Sheffield), for which registration is due by close of 21 June. Immediately following the conference (14–15 July) we are running the Ideas Exchange: HE Mathematics Curriculum workshop at the same location.

Typically at conferences I find myself in 30-minute talks with time for one or two questions at the end, at which speakers present completed and evaluated work. There is good reason for this, of course, but I believe there is space in the calendar for a meeting at which new, undeveloped ideas are discussed in depth with other teaching enthusiasts, and collaborations are formed. The Ideas Exchange, which first took place in July 2011, is designed to meet this need.

Participants are invited to bring an idea – well developed or half-formed – to present in a five-minute talk followed by an extended discussion session (30 minutes or more). Places are limited to fifteen. To ensure whether places are still available please email p.rowlett@bham.ac.uk.

Learn more about the supported projects and events via www.mathstore.ac.uk/hestem.

Peter Rowlett
MSOR Network

NONLINEAR WAVES IN FLUIDS

A conference on Nonlinear Waves in Fluids will take place at Loughborough University from 12 to 14 September 2012. The meeting is dedicated to Roger Grimshaw on the occasion of his retirement. It will be devoted to all aspects of nonlinear waves with applications in geophysical fluid dynamics, thin films and complex fluids.

The list of invited speakers currently includes:

• Mark Ablowitz (University of Colorado, USA)
• Triantaphyllos Akyias (MIT Cambridge, USA)
• Thomas Bridges (University of Surrey, UK)
• Oliver Bühler (Courant Institute, USA)
• Karl Heffrich (Woods Hole Oceanographic Institution, USA)
• Nalini Joshi (University of Sydney, Australia)
• Alfred Osborne (Università di Torino, Italy)
• Efim Pelinovsky (Institute of Applied Physics, Nizhny Novgorod, Russia)
• Victor Shirira (Keele University, UK)

For further information visit the website at www.staff.lboro.ac.uk/%7emakkk/NWF.html. The conference is supported by an LMS Conference grant, the Institute of Mathematics and its Applications, the Marie Curie MULTIFLOW Network and Loughborough University.

VISIT OF F. LUTSCHER

Professor Frithjof Lutscher (University of Ottawa, Canada) will be visiting the UK from 14 June to 2 July 2012. He specializes in applying mathematics as a scientific tool in biology and ecology. Specific interest areas include: river ecosystems modelling; invasion and conservation biology; modelling dispersal in discrete-time systems; individual movement behaviour, random walks and pattern formation. Professor Lutscher will give seminars at:

• University of Glasgow, Tuesday 19 June: Species persistence and spread in patchy landscapes
• Heriot-Watt University, Wednesday 27 June: Life in the flow: modelling river ecosystems
• Centre for Ecology and Hydrology, Wallingford, Oxford, Friday 29 June: Life in the flow: modelling river ecosystems

Whilst at Glasgow University from 14 to 28 June, Professor Lutscher will be working with Dr Christina Cobbold (Glasgow) and Professor Jonathan Sherratt (Heriot-Watt). Whilst in Oxford he will be working with Dr Steven White and will be visiting the Centre for Mathematics as a scientific tool in biology and ecology.
STRING THEORY AND ARITHMETIC GEOMETRY

The aim of this Heilbronn workshop on String Theory and Arithmetic Geometry is to bring together people interested in motivic descriptions of physical ideas with those interested in symmetries and dualities of high-energy physics from an algebraic perspective. Whilst exploring the use of derived categories in both motive-like pursuits and their appearance in particle and string theories, it is hoped to emphasize the computational aspects of these areas so as to have as many concrete examples as possible.

The workshop will be held at the University of Bristol from 3 to 7 September 2012. The registration deadline is 1 August. The Invited Speakers include:

- David Broadhurst (Open University)
- Dirk Kreimer (Humboldt-Universität)
- Steve Lichtenbaum (Brown University)
- Matilde Marcolli* (Caltech)
- Andreas Recknagel* (King's College London)
- Ingo Runkel (Universität Hamburg)
- Ed Segal (Imperial College London)
- Balázs Szendrői (Oxford)
- Katrin Wendland (Universität Freiburg)

* to be confirmed

Applications are invited for a limited number of contributed talks. Please send a title and abstract to the organisers by the registration deadline. There will be limited funding available to young researchers. Please request funding when registering.

Further information and registration forms may be found at http://tinyurl.com/dx8z982 or by contacting Oliver Gray (oliver.gray@bristol.ac.uk) or Owen Patashnick (o.patashnick@bristol.ac.uk).

PROFINITE GROUPS

A one-day meeting on Hausdorff Dimension in Profinite Groups will be held on 22 June 2012 at the University of Southampton. The aim of the meeting will be to explore, in a range of settings, Hausdorff-dimension arguments in the theory of profinite groups. The speakers are:

- Y. Barnea (Royal Holloway Univ. of London)
- M. Abért (Alfréd Rényi Institute, Budapest)
- R. Camina (University of Cambridge)
- B. Klopsch (Royal Holloway Univ. of London)

Limited funds are available to reimburse travel expenses of UK-based students and young mathematicians. Application for support can be made at the meeting. To register send your name and whether you need parking to Martin Kassabov (martin.kassabov@gmail.com). More information is available at www.ma.rhu.ac.uk/profinite_groups/meetings.html. The workshop forms part of the South England Profinite Groups Meetings which are supported by an LMS Scheme 3 grant.

POSTGRADUATE GROUP THEORY CONFERENCE

The Postgraduate Group Theory Conference (PGTC) will this year be hosted at the University of York from 9 to 12 July 2012. This is a networking opportunity for PhD students and others with an interest in group theory and related areas (Lie algebras, representation theory, algebra in general) to give a short presentation about their research to a friendly and interested audience. The PGTC 2012 will include invited speakers Professor Robert Wilson (Queen Mary, University of London) and Dr David Craven (Birmingham University).

The conference itself will include three nights of ensuite bed-and-breakfast accommodation at the University of York campus and a conference dinner on the evening of Wednesday 11 July. To register your interest in attending the PGTC 2012, email Malcolm Connolly (mpc501@york.ac.uk). For further information visit the website at http://maths.york.ac.uk/www/node/12393. The meeting is supported by an LMS Postgraduate Research Conference Scheme 3 grant.
LONDON MATHEMATICAL SOCIETY

SOUTH WEST & SOUTH WALES REGIONAL MEETING

Monday 1 October 2012

SM1, School of Mathematics, University Walk, University of Bristol

Programme:

2.00 Opening of the Meeting

John Cremona (Warwick)

Unusual modular curves and elusive isogenies

3.00 Tea/Coffee

3.45 Tony Scholl (Cambridge)

Special values of L-functions

5.00 Karl Rubin (Irvine)

Ranks of elliptic curves

6.30 Dinner

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

For further details or to register or reserve a place for dinner, please email the organisers (tim.dokchitser@bristol.ac.uk). The cost of the dinner will be approximately £25, including drinks.

The LMS Regional Meeting is part of a three-day workshop on L-Functions of Curves from 1 to 3 October. For further details visit the website at www.maths.bris.ac.uk/~matyd/LMS2012.

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.
London Mathematical Society (LMS)

MIDLANDS REGIONAL MEETING

Monday 3 September 2012

Physics Main Lecture Theatre, Physical Sciences Building
Penglais Campus, Aberystwyth University, Aberystwyth SY23 3BZ

Scientific Advisory Committee
David Evans (Cardiff) - Martin Lindsay (Lancaster) - Giles Paltre (Vassar A&M) - Dan Voiculescu (UC Berkeley)

Local Organisers
Rolf Gohm (Aberystwyth) - John Gough (Aberystwyth) - Claus Köster (Aberystwyth)

Programme

13:45 Opening of the meeting
14:00 Roland Speicher (Saaarland University) - Quantum symmetry in free probability
15:00 Dan-Virgil Voiculescu (UC Berkeley) - Noncommutative probability aspects of trace-class commutators
16:00 Tea/ Coffee
16:30 Masaki Izumi (Kyoto University) - Group actions on operator algebras
17:30 Matthias Christandl (ETH Zurich) - The quantum marginal problem
18:30 Closing of the meeting
19:30 Dinner at MedRitus Conference Centre
Penbryn Building, Penglais Campus
Aberystwyth University, Aberystwyth SY23 3BZ

Principal Organiser Contact
Claus Köster (cok@aber.ac.uk)
Institute of Mathematics and Physics (IMAPS)
Physical Sciences Building, Penglais Campus
Aberystwyth University, Aberystwyth SY23 3BZ

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

For further details, to register or to reserve a place at the dinner, visit the online registration website or contact the principal organiser. The cost of the dinner will be approximately £30, including drinks.

The meeting is embedded into a workshop on Quantum Probabilistic Symmetries from 3 to 7 September 2012. For further details and online registration for the workshop visit the website at http://users.aber.ac.uk/cock/2012/QPS.

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.
Heilbronn Research Fellows (Quantum Information)
£33,884 - £44,166

The Department of Mathematics invites applications for one or more Research Fellowships in association with the Heilbronn Institute for Mathematical Research. You will divide your time equally between your own research and the research programme of the Heilbronn Institute. We seek candidates with skills in the general area of quantum information: however, your own research need not be directly in this area.

The Fellowships will be for three years, with a preferred start date in January 2013, though another date may be possible by agreement. Due to the nature of the Heilbronn Institute’s work, you must satisfy vetting before appointment. UK resident UK nationals will normally be able to meet this condition; other potential applicants should consult the Director about their eligibility before applying. You may become a member of the USS pension scheme. Research expenses of at least £2,000 per annum will also be available. There is a salary supplement of £3,500 pa, in recognition of the distinctive nature of these Fellowships. Payment of this supplement is conditional on a finished thesis having been accepted in final form, because we expect Heilbronn Fellows to hold PhDs before working at the Heilbronn Institute.

Enquiries about the fellowship may be addressed to Dr Oliver Johnson, School of Mathematics, telephone +44 (0) 117 928 8632, e-mail: assoc-director-himr@bristol.ac.uk and enquiries about the work of the Heilbronn Institute may also be addressed to the Director of the Institute, Professor Malcolm MacCallum, telephone +44 (0) 117 980 6303, e-mail: m.a.h.maccallum@bristol.ac.uk

Applications should include a statement of proposed research (not more than one side of A4). You should ask three referees to send references by the closing date to: Ms Chrystel Cherniwichan, School of Mathematics, University of Bristol, BS8 1TW, telephone +44 (0) 117 331 5260 or e-mail: Chrystel.Cherniwichan@bristol.ac.uk It is your own responsibility to ensure that the reference letters are received by the closing date (these may be sent by email also).

For further details and an application form please visit www.bristol.ac.uk/jobs Alternatively you can e-mail recruitment@bristol.ac.uk or telephone +44 (0) 117 954 6947, quoting the reference number 17151.

The closing date for applications is 9.00am, 10 July 2012.

Heilbronn Institute for Mathematical Sciences

www.heilbronn-institute.org

TANGLED MAGNETIC FIELDS IN ASTRO- AND PLASMA PHYSICS

(A satellite meeting at ICMS, Edinburgh)
15–19 October 2012
in association with the Newton Institute programme
Topological Dynamics in the Physical and Biological Sciences
(16 July – 21 December 2012)

Organisers: Konrad Bajer (University of Warsaw), Mitchell Berger (University of Exeter), Steve Cowley (Culham Science Centre), Andrew Gilbert (University of Exeter), Gunnar Homig (University of Dundee) and Clare Parnell (University of St Andrews).

The workshop will focus on research exploiting topological and geometrical concepts in the study of the morphology and evolution of magnetic fields in astrophysics and plasma physics. Magnetic fields are all-pervasive in astrophysics. Such fields generally have non-trivial topology. This results through various mechanisms such as dynamo action within stars which generates and maintains the magnetic field, and also the movement and stressing of the magnetic field by plasma motions that can lead to extremely complex topologies in, for example, stellar coronae. These fields play a crucial role in relation to many observed phenomena in the sun and the solar atmosphere, and similarly in stars and in the interstellar medium. Likewise, the magnetic field is the crucial ingredient in toroidal fusion plasma containment devices like the Tokamak, for which the simplest magnetostatic equilibria are helical in character. More complex equilibria may exhibit current sheet singularities, the site of potential resistive instabilities.

Deadline for applications is 30 June 2012. For more information and application forms visit the website at www.icms.org.uk/workshops/tangled.

PHYSICS AND COMPUTATION

The Physics and Computation 2012 workshop will take place from 29 to 31 August 2012 at Swansea University. The workshop is an interdisciplinary meeting on the frontiers of mathematics, physics, computer science, engineering and biology. The invited speakers include:
- Andy Adamatzky (UWE)
- Hajnal Andréka (Alfréd Rényi, Budapest)
- Ed Blakey (Oxford)
- Barry Cooper (Leeds)
- Arun Holden (Leeds)
- Martin Ziegler (Darmstadt)

The Keynote Lecture will be given by Tony Hey (Microsoft Research). The meeting will commence in the evening of Tuesday August 28 with registration and a welcome reception. Talks start at 9 am on Wednesday morning and finish at 2 pm Friday afternoon. For further information email the Local Organizing Committee (pc2012@swansea.ac.uk) or visit the website at www.cs.swansea.ac.uk/pc2012. The workshop is receiving support from EPSRC, the Institute of Physics, the Learned Society of Wales, the Turing Centenary, and an LMS Conference grant.
STOCHASTIC PARTIAL DIFFERENTIAL EQUATIONS
(Follow-up meeting)
10–14 September 2012

Organisers: Zdzislaw Brzezniak (York), David Elworthy (Warwick), Michael Röckner (Bielefeld), Panagiotis Souganidis (Chicago) and Roger Tribe (Warwick)

This workshop on Stochastic Partial Differential Equations is a follow-up meeting to the six-month programme at the Isaac Newton Institute in 2010. The following themes are expected to be part of the follow-up meeting:

- Stochastic conservation laws
- Stochastic interface models
- Infinite-dimensional analysis
- Equations driven by Levy noises
- Large deviations problems for SPDEs
- Numerical approximations
- Stochastic models in hydrodynamics and other physical applications

For more information visit the website at www.newton.ac.uk/programmes/SPD/spdw07.html.

POSTGRADUATE COMBINATORIAL CONFERENCE

The 22nd Postgraduate Combinatorial Conference (PCC) will be held at the University of Warwick from 15 to 17 August 2012. PCC is an established annual conference organised by, and for, current research students in all areas of combinatorial and discrete mathematics, under the auspices of the British Combinatorial Committee. The PCC is mainly aimed at UK-based students, but also open to those from abroad.

The aim of the conference is to allow research students to meet and discuss their research in a relaxed environment, to gain practice at presenting their research outside of their own department, and to meet pre-eminent researchers in their area. Each student is encouraged to contribute by giving a talk which will last 20 minutes (including five minutes question-and-answer time). Speakers will include:

- Stefanie Gerke (Royal Holloway, University of London)
- Konrad Swanepoel (LSE)
- Andrew Thomason (University of Cambridge)

For further details visit the website at www2.warwick.ac.uk/fac/cross_fac/dimap/events/pcc2012.

The conference is supported by an LMS Postgraduate Research Conference Scheme 8 grant and a grant from the British Combinatorial Committee.
BRITISH TOPOLOGY MEETING
The 27th British Topology Meeting will take place in Cambridge from 6 to 8 September 2012. The conference is primarily aimed at graduate and postgraduate students in topology, geometry and cognate fields. It is designed to showcase recent activity in a broad range of areas in topology, including algebraic topology, geometric group theory, low-dimensional topology and symplectic geometry. This year's invited speakers are:

- Paul Biran (ETH)
- Dorothy Buck (Imperial)
- Danny Calegari (Cambridge)
- Simon Donaldson (Imperial)
- Marc Lackenby (Oxford)
- Zoltán Szabó (Princeton)
- Nathalie Wahl (Copenhagen)

There will also be a number of shorter talks, selected from abstracts submitted by participants on registration; all participants should register, and those wishing to offer a talk are encouraged to register by the end of July. For further information, in particular to register or to submit an abstract for a presentation, visit the website at www.dpmms.cam.ac.uk/seminars/Conferences/BTM2012/index.html or contact the organizers Jake Rasmussen (j.rasmussen@dpmms.cam.ac.uk) and Ivan Smith (i.smith@dpmms.cam.ac.uk). The meeting is supported by an LMS Conference grant and the Foundation Compositio Mathematica.

LOGIC COLLOQUIUM 2012
Logic Colloquium 2012 will be held at the University of Manchester from 12 to 18 July 2012. Invited plenary speakers include:

- Jeremy Avigad (Carnegie Mellon University)
- Andreas R. Blass (University of Michigan)
- Samuel R. Buss (UC San Diego)
- Harvey Friedman (Ohio State University)
- Gareth Jones (University of Manchester)
- Péter Komjáth (Eötvös Loránd University)
- Leonid Levin (Boston University)
- Giuseppe Longo (École Normale Supérieure, Paris)
- Angus Macintyre (Queen Mary, University of London)
- Menachem Magidor (Hebrew University)
- Zili Sela (Hebrew University)
- V. Yu. Shavrukov (University of Amsterdam)
- Alexandra Shlapentokh (East Carolina University)
- Mariya I. Sokolova (Sofia University)

There will be tutorial courses on set theory (Iljaz Farah), computability theory (Antonio Montalbán) and model theory (Boris Zilber). Special sessions topics include:
- Philosophy of Mathematics and Computer Science
- Computability, Logical and Physical
- Model Theory
- Homotopy Type Theory
- Set Theory

For further information visit the website at www.mims.manchester.ac.uk/LC2012/. The meeting is held under the auspices of the Association for Symbolic Logic, and incorporates this year’s meeting of the British Logic Colloquium. The meeting is supported by an LMS Conference grant, the ASL, the BLC and the Manchester Institute for Mathematical Sciences.

LATTICES AND RELATIONS
A workshop on Lattices and Relations will take place from 12 to 14 September 2012 at the Institute for Logic, Language and Computation, University of Amsterdam.

Relation algebra in its modern form has been developed in fruitful exchange with neighbouring disciplines such as lattice and order theory, universal algebra, category theory, topology and model theory. Relational and lattice-theoretic methods are important to the semantic study of many non-classical logics, as well as in the foundations of computer science, where they have widespread applications. This has led to the formation of a research area that is defined by a quite liberal attitude in which results, tools and techniques from neighbouring fields are freely transported and combined. The area thus serves as an interface between fields such as logic, universal algebra, topology, category theory, order, and model theory.

The workshop is aimed to bring together researchers from various countries who are active in different facets of this area. This is the second workshop in the series: the first was at University College London in 2010. While lattices and relations are the main thread of these workshops, this second workshop particularly welcomes contributions about connections with topics such as semigroups, semirings, quantales, Kleene algebras and fixpoint calculi.

Title and abstract of submissions should be sent to Szabolcs Mikulas (szabolcs@bcs.bbk.ac.uk) by 15 June 2012. Communication of attendance should be sent to Alessandra Palmigiano (lattices-relations-science@uva.nl) by 8 July 2012.

For further information visit the website at www.illc.uva.nl/Workshops/LR2012.

HEILBRONN ANNUAL CONFERENCE
The 2012 Heilbronn Annual Conference will be held at the University of Bristol from 20 to 21 September. A number of distinguished mathematicians are invited to present lectures, intended to be accessible to a mixed audience of mathematicians. The topics will cover the range of the Institute’s interests as outlined on its web page at www.maths.bris.ac.uk/research/Heilbronn_institute/. Confirmed speakers include:

- Eva-Maria Feichtner (Bremen)
- Kristin Lauter (Microsoft and Washington)
- Mark Maloof (Georgetown)
- Andrew Odlyzko (Minnesota)
- Toby Stafford (Manchester)
- Wendelin Werner (Paris-Sud)

All interested mathematicians are invited to attend. There is no registration fee but to enable estimation of numbers, intending participants are requested to inform Alice Adams (heilbronn-coordinator@bristol.ac.uk). All participants are invited to take part in the conference dinner, for which there will be a charge of £25: this can be booked through Alice.

UK graduate students and postdoctoral fellows who would like to attend and need support should contact Alice before 15 July 2012 detailing their requirements, enclosing a brief CV, and explaining why other support is not available. The final programme and additional details will be posted on the Institute website in due course.
LONDON MATHEMATICAL SOCIETY

NEWSLETTER www.lms.ac.uk/newsletter

No. 415 June 2012

LMS INVITED LECTURES 2012

Report

The LMS Invited Lectures took place at the School of Mathematics and Statistics, University of Glasgow from 26 to 30 March 2012. Professor Alexei Borodin gave a total of 10 lectures on Determinantal point processes and representation theory. In the lecture course Alexei presented a remarkable mixture of ideas and methods from probability theory and representation theory of the infinite symmetric and infinite-dimensional unitary groups.

Alexei started the lectures from the representation-theoretic side. The infinite symmetric group was introduced and Alexei discussed its character theory. The corresponding representations were explained and probabilistic interpretations of characters were given. Then the generalized regular representation in the space of virtual permutations was introduced and it was explained how it decomposes into the irreducible representations.

In the second day of the lectures Alexei started to discuss probabilistic problems. In an entertaining lecture he demonstrated how the famous problem of finding the length of the longest increasing subsequence in a random permutation is related to sorting algorithms. The presence of the infinite-dimensional unitary group behind both the infinite symmetric group and random matrices provided some justification of the appearance of the Tracy–Widom distribution in the problem of the longest increasing subsequence.

In the subsequent lectures Alexei introduced determinantal random point processes and he developed techniques to work with them. This part of the course was most detailed and concrete. Alexei introduced a large class of Schur measures on the point configurations on a lattice and he showed that the correlation functions are determinantal with an explicit correlation kernel. This culminated in a complete proof of the Baik–Deift–Johansson theorem.

The lecture course was supplemented by single lectures given by Professors Ivan Corwin, Patrik Ferrari and Neil O’Connell. These lectures were mostly on the probabilistic side of the main lecture course. In particular, they dealt with the partition function of the semi-discrete polymer model and the large time limit shape for totally asymmetric simple exclusion processes on the line. These single lectures were supported by the Edinburgh Mathematical Society.

In the final part of the course Alexei considered Schur and Macdonald processes that are measures on the sequences of Young diagrams and he also discussed the associated Markov chains. This provided connections to the topics of the supplementary lectures and unified all the material.

Alexei’s lectures were scheduled in the mornings while afternoons were left for the three supplementary lectures and free time and discussions. Throughout the entire week participants were able to enjoy extraordinarily warm weather by taking advantage of walking in the parks surrounding the university.

Thoughtful combination of material and excellent explanations by Alexei made the lectures a success. I would like to thank the LMS, the Edinburgh Mathematical Society, Alexei and all the lecturers and participants for the event.

Misha Feigin
University of Glasgow

A comment from Alexei Borodin: ‘Delivering the LMS lectures was a unique experience. Intense schedule, inquisitive and well-prepared audience, and excellent supplementary lectures created a very friendly and productive atmosphere that I thoroughly enjoyed. I am very grateful to the LMS, Misha Feigin and all the participants for making this possible.’

CATEGORICAL METHODS IN REPRESENTATION THEORY

A five-day conference/workshop on Categorical Methods in Representation Theory will take place at the University of Bristol from 24 to 28 September 2012. It will focus on categorical approaches to various aspects of the representation theory of finite groups and finite-dimensional algebras. The week will consist of three short lecture courses and roughly 12 one-off lectures given by experts in the field, as well as several contributed talks. The short courses will be:

- Dave Benson (Aberdeen) The stable category
- Michel Broué (Paris 7) The derived category
- Mike Prest (Manchester) The functor category

Other speakers will include Paul Balmer, Michel Broué (Paris 7), David Benson (Aberdeen), Raphaël Rouquier (tbc), Peter Symonds, Will Turner and Peter Webb.

The conference is supported by an LMS Conference grant to provide financial assistance to postgraduates and young researchers and by the Heilbronn Institute. For further information email CMRT2012@gmail.com or visit the website at www.maths.bris.ac.uk/~majwm/CMRT/start.php.

LMS CONFERENCE FACILITIES

Organising a conference in central London? Meeting rooms and catering are available in De Morgan House. For terms and availability, please call 020 7927 0800 or email roombookings@demorganhouse.co.uk.
Report

Over the last thirty years model-theoretic constructions and techniques have had a significant impact in areas such as number theory, algebraic geometry and group theory. Important roles are played, for instance, by various limit constructions and methods from $p$-adic and motivic integration. Asymptotic and geometric group theory are closely interlinked with these ideas.

For instance, the original proof of Gromov’s celebrated Polynomial Growth Theorem uses an ingenious limit construction. The theorem, which is a cornerstone of geometric group theory, characterises finitely generated groups with polynomial word growth as those which are virtually nilpotent. Both the theorem and its proof continue to serve as an important source of inspiration. Current research connects Gromov’s theorem with advances in non-commutative additive combinatorics, in particular regarding the study of approximate groups.

Limit groups arise naturally in the exploration of the ‘algebraic geometry’ and first-order theory of groups. They are a crucial feature of Sela’s work on the Tarski problems, concerning the elementary theory of finitely generated non-abelian free groups and more generally torsion-free word-hyperbolic groups.

In the study of zeta-functions of groups and rings, one encounters $p$-adic integrals which generalise Igusa local zeta-functions. In this context quantifier elimination results can be used to prove the rationality of Poincaré series arising from the study of integer solutions to polynomial equations. These kinds of results and techniques have been generalised to the context of motivic integrals.

The workshop held at Royal Holloway, University of London from 26 to 27 March 2012 focused on some of the current trends at the interface of model theory and group theory. It attracted about 40 participants from the UK and overseas, including many research students and young researchers. With a view toward applications in asymptotic and geometric group theory, the eight invited talks of the workshop focused on three broad topics, partly alluded to above:

1. Approximate groups and Gromov’s polynomial growth theorem
2. Limit groups and group equations
3. Motivic and $p$-adic integration with applications to groups

The speakers presented not only results, but also key methods and open problems, initiating further discussions amongst the participants. More detailed information on the academic programme and additional resources (e.g. lecture slides for some of the talks) can be found on the workshop’s dedicated website at www.ma.rhul.ac.uk/model-theory.

The attendance and talks by model theorists and mathematicians applying model theory to problems in algebra and number theory rendered the meeting very fruitful. There were ample opportunities for informal interactions. Photographs from the event can be found on the back cover of this Newsletter.

The organisers of the event gratefully acknowledge the support provided by the London Mathematical Society, the EPSRC and Royal Holloway. The workshop formed part of the South England Profinite Groups Meetings. This LMS joint research group has been organising regular meetings (three per year) since 2007. The next meeting, dedicated to Hausdorff dimension in profinite groups, will take place at the University of Southampton on 22 June 2012. Further information on past and future events can be found at www.ma.rhul.ac.uk/profinite_groups/meetings.html.

Benjamin Klopsch
Royal Holloway, University of London
BIOLOGICAL FLOW – TJP FEST
Report

One hundred delegates gathered in Cambridge from 2 to 3 April 2012 for TJP Fest, a conference to celebrate the 70th birthday of Tim Pedley, FRS, Emeritus G.I. Taylor Professor of Fluid Mechanics at the University of Cambridge. The meeting was hosted in the Centre for Mathematical Sciences and financial support was provided by the LMS. The theme of the meeting was Biological Flow and the 47 talks and 11 posters reflected the breadth of topics to which Tim Pedley has contributed over his career. Among the speakers were many of his former PhD students, who now populate mathematics departments across the UK. Professor Pedley is well known for his contributions in fluid mechanics and for his service to UK mathematics (for example as Chair of the RAE 2008 Applied Mathematics sub-panel and former President of the IMA). The numerous overseas delegates at the meeting demonstrated how his influence extends significantly beyond this, particularly into disciplines such as biology and bioengineering.

A very brief survey of the topics presented by the meeting’s overseas contributors in indicates the breadth of topics discussed. The human cardiovascular system inspired talks on pulse propagation in networks of arteries (Mette Olufsen, North Carolina State), transport in the lymphatic system (Jimmy Moore Jr., Texas A&M), the performance of artificial heart valves (Ajit Yoganathan, Georgia Tech), gas embolisms for targeted drug delivery to tumours (Joseph Bull, Michigan) and the motion of red blood cells or biological capsules through narrow vessels (Dominique Barthès-Biesel, Compiègne; Tim Secomb, Arizona; Takami Yamaguchi, Tohoku; Sheldon Weinbaum, City College New York). Other applications of ‘internal’ biological fluid mechanics included transport across epithelium via electro-osmosis (Jorge Fischbarg, Buenos Aires), olfaction in the nose (Michael Borgas, CSIRO, Australia) and problems concerning lung airway recruitment (Don Gaver, Tulane; James Grotberg, Michigan).

The other major focus of the meeting was ‘external’ flows generated by organisms that swim and feed in a liquid environment. At the smallest length-scales, single-cell microorganisms (bacteria, algae or spermatozoa) propel themselves with one or more cilia or flagella. Roman Stocker (MIT) showed how mathematical models give insights into the mechanical properties of such structures at nanometre length-scales. Other talks (including one from Professor Pedley) discussed models for microscopic swimmers under the influence of light, external shear and nearby boundaries. Sebastian Michelin (École Polytechnique) addressed an optimisation problem concerning swimming and feeding strategies of ‘squirming’ organisms. At larger length-scales, Houshuo Jiang (Woods Hole Oceanographic Institution) and Thomas Kierboe (Technical University of Denmark) described models for marine copepods that ambush their planktonic prey through intermittent jumps or by generating feeding currents. Professor Pedley has long-standing collaborations with Indian researchers, represented at the meeting by Girija Jayaraman (IIT Delhi), who described how mathematical models are used to describe the ecology of plankton populations in Indian ocean systems. Further contributions included studies of thrust generation by a flapping foil (Anders Andersen, Technical University of Denmark) and a survey by John Bush (MIT) of drinking strategies in organisms ranging from desert beetles to wading birds. A photograph from the conference can be found on the back cover of this Newsletter.

Many of the topics described at the meeting by UK and overseas contributors will appear shortly in a special issue of the Journal of Fluid Mechanics.

Oliver E. Jensen
University of Nottingham
SCULPTURE UNVEILING: YORKSHIRE AND DURHAM GEOMETRY DAY

Report
On the afternoon of 14 March 2012, a sculpture in stone inspired by a 4-lobed Willmore torus was unveiled on the Science Site of Durham University. This major work of art celebrates the impact on mathematics of the work of Tom Willmore, who was Professor of Pure Mathematics at Durham from 1965 until his retirement in 1984.

Tom Willmore instigated the study of surfaces of minimal value with respect to a global extrinsic curvature measure for a surface, now called its Willmore energy, by contributing relevant results and stating a challenging conjecture for tori. Efforts stimulated by this have led to the study by mathematicians worldwide of surfaces with stationary Willmore surfaces. The 4-lobed Willmore torus is one of the particularly beautiful, symmetric Willmore surfaces discovered by Dirk Ferus (Technical University of Berlin) and Franz Pedit (Amherst and Tübingen).

This surface inspired the artist Peter Sales to create the sculpture. Its unveiling was preceded by a public lecture, attended by about 180 people, by Professor Pedit. In his lecture, entitled The Willmore Conjecture – the first 50 years, Franz explored the significance of Willmore surfaces, and their relation to Tom and Durham. Franz is particularly well qualified to give this lecture, since he has played a prominent role in the study of Willmore surfaces since his first extended visit to Durham in 1987 as a post-doc of Tom Willmore.

After speeches from the Vice-Chancellor of Durham University, Professor Chris Higgins, and Tom's widow, Dr Gillian Boughton, the unveiling itself was performed before a crowd of several hundred people by some of the Willmore Pure Mathematics Postgraduate Fellows. These fellowships are funded from the Willmore Scholarship Fund, which was set up to allow students to continue their studies in pure mathematics at Durham University. After the sculpture unveiling, approximately 300 cupcakes (each decorated with a picture of a Willmore surface) were consumed at a reception held to mark the event.

These celebrations were embedded in a momentous and well-attended meeting in the series of the Yorkshire and Durham Geometry Days. In addition to Professor Pedit, the speakers were Brendan Guilfoyle (Tralee) and Andre Neves (Imperial).

Andre's talk Min-max methods and the Willmore conjecture was particularly appropriate since he described the ideas behind his recent preprint with Fernando Marques (IMPA), proving Tom Willmore's conjecture. This work (http://arxiv.org/abs/arXiv:1202.6036), which uses the calculus of variations and geometric measure theory, follows progress on the regularity problem by Kuwert and Schätzle and by Rivière. This was the first talk Andre had given on his solution of the conjecture.

Brendan's talk A capillary problem in codimension two with application described aspects of the proof, by himself and Wilhelm Klingenberg (Durham), of a conjecture of even dimension two with applications, as was the case in the proof in 2003 of the Poincaré Conjecture.

Further details of the day's proceedings, including videos of all three talks, may be found at www.maths.dur.ac.uk/events/Meetings/Willmore2012.

Further information about Tom Willmore and the Willmore Foundation, including a list of the Willmore Pure Mathematics Postgraduate Scholars, may be found at www.dur.ac.uk/mathematical.sciences/postgrads/willmore.

The universities of Durham, Leeds and York gratefully acknowledge the long-standing financial support of the London Mathematical Society for the series of Yorkshire and Durham Geometry Days. A record of previous meetings in this series is available at www1.maths.leeds.ac.uk/pure/geometry/ydgdg/old.html.

John Bolton & Wilhelm Klingenberg
Durham University

REVIEWS


This book is the fourth in the The Big Questions series published by Quercus and edited by Simon Blackburn. The book under review is a nifty-looking little blue-cloth hard cover with an elasticised black-band page marker attached to the back. As one of my students put it, the book just feels ‘cool’. All of the texts of the series make excellent travelling books and are very entertaining reads for the lay-person, with the prior books in the series generally receiving very positive reader reviews on Amazon.com. To date, the titles in the series include Philosophy, Physics, the Universe and the book under review, Mathematics.

This book, written by Tony Crilly, continues the strong tradition of the series; it is very entertaining and puts twenty questions of and about mathematics on the table, addressing each with a compact essay, and with interconnections between topics well cross-referenced. The author’s expertise in the history of mathematics shows in his ability to place the discussion of his selected Big Questions into context. Laypersons reading the text will be entertained and enlightened as to the ‘why’s and ‘how’s of the appearances of mathematics in everyday life, and if mathematics students at university read this text early on in their coursework, then likely they would be much improved; perhaps even understand why we recommend the studies we do, and how it is we claim that mathematics is the lively, organic and dramatically growing field that it is today. In short, I must give this little blue book a strong positive review.

The author applies high art in order to discuss the development of real mathematics within entertainingly titled chapters like ‘What is mathematics for?’, ‘How big is infinity?’, or ‘Can a butterfly’s wings really cause a hurricane?’. For the reviewer, favourite
chapters included ‘Are statistics lies?’, ‘Is mathematics true?’ and ‘Is there anything left to solve?’. Ironically, two of these last chapters also played host to the few minor issues I had with the text.

Lest I sound too positive, let me now mention those few minor quibbles. Firstly, I felt that some mention should have been made, within the discussion on the debates between intuitionists and formalists in the early 1900s, of Poincare’s wonderful contributions to those discussions. Secondly, perhaps the discussion of the Navier–Stokes equations was a bit light in the context of the rest of the discussions of the Clay Prize questions in the chapter ‘Is there anything left to solve?’ And, finally, after doing an excellent job covering the difficult Gödel’s Incompleteness Theorem, the text ends the discussion of ‘Is mathematics true?’ with a bit of a sad poetic bailout into the text ends the discussion of ‘Is mathematics true?’ with a bit of a sad poetic bailout into the

According to its editors, Mathematics in Victorian Britain is the first general survey of Victorian mathematics. The editors are right. Other major English-language surveys of mathematics include Eleanor Robson’s and Jacqueline Stedall’s The Oxford Handbook of the History of Mathematics, which offers short chapters covering varying cultures in mathematics from antiquity to modernity, as well as Ivor Grattan-Guinness’s Landmark Writings in Western Mathematics: 1640–1940, which offers snippets of key texts published in the history of mathematics over the past 300 years. But neither of those previous publications focuses specifically on British mathematics.

With an A-list of contributors, Mathematics in Victorian Britain meets high expectations. The intention of the compendium is to provide an overview of the breadth, scope and nature of mathematics throughout the Victorian period.

It was a time during which Britain was transformed politically, culturally, industrially, and mathematically. As is argued throughout the publication, the legacy of Victorian mathematics resides in mathematical physics. Names such as William Thomson, George Gabriel Stokes, Peter Guthrie Tait and James Clerk Maxwell serve as thematic descriptors of the period in general, in particular in theories of heat, thermodynamics and electromagnetism. Iron, steel and steam engine industries propelled applied mathematics into an era of great scientific innovation, including the mathematicalisation of ‘energy’ and the formalisation of vectors.

In pure mathematics, on the other hand, British mathematicians performed weakly. Arthur Cayley, James Joseph Sylvester and their Oxford colleague Henry Smith did help to transform the notion of matrices into a full-blown theory of linear algebra. Cayley and Sylvester further worked to develop invariant theory. Yet, despite Cayley’s and Sylvester’s prolific and productive engagements, pure mathematics in Britain failed to rival its European counterparts.

In the opening chapters, Tony Crilly, Keith Hannabuss, Adrian Rice, Raymond Flood and June Barrow-Green cover the development of Cambridge’s Tripos mathematics system, Oxford’s lack of mathematical culture, and attitudes towards mathematics in universities in Scotland, Ireland and throughout the Commonwealth. Sloan Evans Despeaux then explores the publications through which Victorian mathematics was disseminated. A.D.D. Craik, Allan Chapman, Doron Swade, and M. Eileen Magnello describe areas of applied mathematics that were especially strong throughout this period, including astronomy, calculating engines, as well as vital and mathematical statistics. Magnello’s chapter, ‘Vital Statistics: The measurement of public health’, explores Florence Nightingale’s use of statistics in tracking illness and hygienic standards. It stands out as a colourful account of nursing-as-statistics in the Victorian period.

The final chapters provide readers with a survey of pure mathematics in Britain from the development of rigorous calculus, geometry, and algebra to the rise of logic and combinatorics. Two chapters stand out as especially technical, namely Karen Hunger Parshall’s ‘Victorian Algebra: The freedom to create new mathematical entities’, and I. Grattan-Guinness’s ‘Victorian Logic: from Whately to Russell’. Yet both contributions still appeal to the general reader, as they contextualise algebra and logic by placing them within the fluctuating social conditions of Britain at a time when citizens were questioning absolutist norms of truth and veracity in politics, religion and, most especially, science.

The compendium ends on a contrarian note, however, with Jeremy Gray’s ‘Overstating their case? Reflections on British pure mathematics in the nineteenth century’. Gray argues that Victorian-era mathematicians in Britain are often over-rated. Vis-à-vis their European and continental colleagues, British mathematicians under-performed and under-innovated. The supposed ‘Greets’, including Cayley, Sylvester and perhaps the young William Kingdon Clifford, whose work on quaternions and non-Euclidean geometry was cutting edge, did not meet European standards. “British pure mathematicians of the nineteenth century have been overrated, to the detriment of historical writing on the subject,” Gray writes, adding “what is striking about so many British mathematicians is their belief that they were the equals of their Continental peers, when no such comparison can be entertained”.

At 466 pages, the compendium is worth the read and certainly worth the price for both the mathematical dabbler and the historical debant. For specialist researchers in the history of mathematics, the most valuable component is its brilliant ‘Notes, References, and Further Reading’, which provides thorough literature reviews of each topic discussed on a chapter-by-chapter basis.

Similar compendia exploring mathematics throughout the seventeenth, eighteenth and twentieth centuries would be welcome additions to the libraries of mathematical historians.

Josipa Petrunic
SSHRC Research Fellow, History of Mathematics
University of Alberta


Tony Crilly
University of St Andrews

The Big Questions
Mathematics
Tony Crilly

Series Editor
Simon Blackburn

SSHRC Research Fellow, History of Mathematics
University of Alberta

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# 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 of meetings and events is given on the Society’s website (www.lms.ac.uk/content/calendar).

Please send updates and corrections to calendar@lms.ac.uk.

## June 2012

<table>
<thead>
<tr>
<th>Date(s)</th>
<th>Event Details</th>
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<tbody>
<tr>
<td>1-2</td>
<td>Recent Developments in Lie Theory Workshop, Manchester (414)</td>
</tr>
<tr>
<td>4-8</td>
<td>Scale Transitions in Chemistry and Biology ICMS Workshop Edinburgh (415)</td>
</tr>
<tr>
<td>5-8</td>
<td>Higher Order Problems in Geometric Analysis Workshop, Bath (409)</td>
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<tr>
<td>6</td>
<td>LMS Northern Regional Meeting, Northumbria University, Newcastle (414)</td>
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<tr>
<td>6-9</td>
<td>Banach Spaces Workshop 2012, Birmingham (413)</td>
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<tr>
<td>7-8</td>
<td>Essex-Greenwich-Hertfordshire Workshop on Applied and Numerical Mathematics, Greenwich (414)</td>
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<tr>
<td>7-9</td>
<td>Beauville Surfaces and Groups Conference, Newcastle (414)</td>
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<tr>
<td>8</td>
<td>Spectral Theory of Hankel Operators and Related Topics Workshop, King's College London (414)</td>
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<tr>
<td>10-16</td>
<td>SIDE10 International Conference on Symmetries and Integrability of Difference Equations, Ningbo, P.R. China</td>
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<tr>
<td>11-12</td>
<td>Stochastic Modelling in Ecosystems Workshop, Glasgow (414)</td>
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<tr>
<td>11-12</td>
<td>Numerical Analysis of Stochastic PDEs Workshop, Warwick (413)</td>
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<tr>
<td>12-15</td>
<td>The Incomputable Workshop, Chicheley Hall, North Buckinghamshire (407)</td>
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<tr>
<td>12-15</td>
<td>Chaotic Modeling and Simulation International Conference, Athens, Greece</td>
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## July 2012

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<tr>
<th>Date(s)</th>
<th>Event Details</th>
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<tr>
<td>2-3</td>
<td>Numerical Linear Algebra, Control Theory and Data Assimilation Conference, Reading (414)</td>
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<tr>
<td>2-3</td>
<td>Branes, Supergravity and M-Theory Conference, Cambridge (414)</td>
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<tr>
<td>2-6</td>
<td>Applied and Computational Topology ICMS Workshop, Edinburgh (415)</td>
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<tr>
<td>2-7</td>
<td>6th European Congress of Mathematics, Kraków, Poland (409)</td>
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## August 2012

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<th>Date(s)</th>
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<tr>
<td>15-17</td>
<td>Postgraduate Combinatorial Conference, Warwick (415)</td>
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<tr>
<td>20-24</td>
<td>Finite Groups, Representations and Related Topics, Oxford</td>
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<tr>
<td>26-28</td>
<td>Modern Mathematical Methods in Science and Technology Conference, Kalama, Greece (411)</td>
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<tr>
<td>27-30</td>
<td>Algebra, Combinatorics, Dynamics and Applications Workshop, Queen's University Belfast (410)</td>
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<tr>
<td>29-31</td>
<td>Physics and Computation 2012 Workshop, Swansea University (415)</td>
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## September 2012

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<tr>
<th>Date(s)</th>
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<tr>
<td>1-3</td>
<td>International Pure Mathematical Conference 2012, Islamabad, Pakistan (412)</td>
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<tr>
<td>3</td>
<td>LMS Midlands Regional Meeting, Aberystwyth (415)</td>
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<tr>
<td>3-7</td>
<td>Quantum Probabilistic Symmetries Workshop, Aberdeen (415)</td>
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<td>3-7</td>
<td>Topological Aspects of DNA Function and Protein Folding INI Workshop, Cambridge (412)</td>
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<td>6-8</td>
<td>British Topology Meeting, Cambridge (415)</td>
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<td>6-8</td>
<td>Future Directions for Quantum Groups Conference, Lancaster (414)</td>
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<td>7-12</td>
<td>Stochastic and PDE Methods in Financial Mathematics Workshop, Armenia (414)</td>
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<tr>
<td>10-13</td>
<td>Nonlinear PDE Conference, Oxford (414)</td>
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<tr>
<td>10-14</td>
<td>Stochastic Partial Differential Equations INI Workshop, Cambridge (415)</td>
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<tr>
<td>12-14</td>
<td>Lattices and Relations Workshop, Amsterdam (415)</td>
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<tr>
<td>12-14</td>
<td>Nonlinear Waves in Fluids Conference, Loughborough (415)</td>
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<tr>
<td>14-15</td>
<td>Free Surface and Interface Problems Workshop, Oxford (414)</td>
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<tr>
<td>15-16</td>
<td>Mathematicians and their Gods, Oxford (415)</td>
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<tr>
<td>20-21</td>
<td>Heilbronn Annual Conference, Bristol (415)</td>
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<td>9-22</td>
<td>Topological Solitons Conference, Cambridge (412)</td>
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<tr>
<td>24-28</td>
<td>Categorical Methods in Representation Theory Conference/Workshop, Bristol (415)</td>
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<tr>
<td>26</td>
<td>LMS Popular Lectures, Birmingham (415)</td>
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<tr>
<td>27-30</td>
<td>Mathematics of John Thompson, CMS (415)</td>
</tr>
<tr>
<td>27-30</td>
<td>Finite Groups and Related Topics Conference (415)</td>
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Asymptotic Group Theory and Model Theory Workshop
held at Royal Holloway, University of London from 26 to 27 March 2012
(report on page 31)

Speaker Dugald Macpherson (Leeds)
Organiser Ben Klopsch (Royal Holloway)
and Speaker Nick Gill (Open University)

Biological Flow – TJP Fest
held at the University of Cambridge from 2 to 3 April 2012
(report on page 33)