MATHEMATICAL SCIENTISTS TAKE THEIR RESEARCH TO PARLIAMENT

Dr David Platt, a researcher at the University of Bristol, won the Gold medal (sponsored by the Clay Mathematics Institute) in the mathematical sciences session of this year’s SET for Britain event, walking away with a £3,000 prize. This was a notable year for the mathematical sciences as it was the first time they were invited to take part in the event.

David presented his mathematics research to dozens of politicians and a panel of expert judges, and his research, proving Goldbach’s weak conjecture, was judged against 29 other shortlisted researchers’ work, from an original entry of over 50 posters.

David, said, ‘The standard of the posters was fantastic and to be judged the best is a great honour’. Professor Nicholas Woodhouse, President of the Clay Mathematics Institute (CMI), sponsors of the Gold Mathematical Sciences award, said, ‘CMI is delighted to support the inaugural SET for Britain Mathematical Sciences exhibition. The Institute is dedicated to increasing and disseminating mathematical knowledge and supports the work of leading researchers throughout the world at various stages of their careers. The future of mathematics in the UK is both challenging and exciting and we believe it is essential to nurture the best technical talent’.

The Silver award and £2,000 went to Dr Christian Yates from the University of Oxford for his research in understanding locust swarming behavior using mathematical models. The Bronze...
# LMS Newsletter

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FURTHER BOOST FOR THE MATHEMATICAL SCIENCES

The Chancellor of the Exchequer, George Osborne, has announced 22 new Centres for Doctoral Training (CDT). The new CDTs come on top of the 91 Centres previously announced by the Engineering and Physical Sciences Research Council (EPSRC) in November 2013 and January 2014. This latest government investment in a further 1,100 students through these additional 22 Centres brings the total investment in CDTs to over £500 million.

The new CDTs supported in the mathematical sciences are:

- Professor Andreas Kyprianou (University of Bath) Statistical Applied Mathematics at Bath (SAMBa)
- Professor James Norris (University of Cambridge) Analysis (Cambridge Centre for Analysis)
- Professor Anthony Carbery (University of Edinburgh) Mathematical Analysis and its Applications: Maxwell Institute Graduate School in Analysis & Applications (MIGSAA) jointly sponsored by the Scottish Funding Council; and
- Professor Peter Sollich (King’s College London) Cross Disciplinary Approaches to Non-equilibrium Systems

This success continues to reflect the importance of mathematical sciences research in underpinning our 21st century technology, economy and society. This is also recognised in the employment market, where the prospects for our graduates and postgraduates are amongst the best. The flow of trained mathematical scientists into other disciplines and into the industries of the future relies upon our universities’ research and teaching excellence.

The list of full list of mathematical science CDTs is available on the LMS website at www.lms.ac.uk/policy/doctoral-training.

MATHEMATICS POLICY ROUND-UP

April 2014

RESEARCH

Plans for world class research centre in the UK

The government is creating a world-class research institute specialising in data science dedicated to British mathematician and WW2 code-breaker Alan Turing.

‘The Alan Turing Institute for Data Science will benefit from a £42 million government investment over 5 years that will strengthen the UK’s aims to be a world leader in the analysis and application of big data. It will also ensure that the UK is at the forefront of data-science in a rapidly moving, globally competitive area, enabling first-class research in an environment that brings together theory and practical application. Once operational, this will be a world-leading institute, attracting the best talent and investment from across the globe and will provide a fitting memorial to Alan Turing.’

More information is available at http://tinyurl.com/lupyewy

Performance and Economic Impact Report 2012 - 2013

EPSRC has published its Performance and Economic Impact Report 2012-2013. The report highlights the main achievements for the year: http://tinyurl.com/qg5374v

RCUK Impact Report

According to RCUK this report shows that, ‘the UK research base is not only at the cutting edge of scientific and academic discovery, but also is doing more to translate this into practical wider benefits. This helps to keep us ahead in the global race’.

The report is available at http://tinyurl.com/obfk6gx

SCHOOLS AND COLLEGES

Core mathematics

ACME has responded to the Department for Education informal consultation on ‘Core Maths’. The ACME response can be found at http://tinyurl.com/q3ewp5j

The Department for Education has opened applications for schools and colleges to bid for funding to become early adopters of core maths qualifications, with teaching to begin in Autumn 2014: http://tinyurl.com/mlhp26c

Nuffield Foundation response to DfE Core Mathematics policy statement http://tinyurl.com/lwzspj4

Subject Knowledge Enhancement Programme Guide 2013/2014

The Department for Business, Innovation and Skills (BIS) has published the Mathematics Subject Knowledge Enhancement (SKE) programme guide 2013/2014.

In the programme guide BIS sets out who might want to do Subject Knowledge Enhancement courses, including:

- those who have studied mathematics to a highly advanced level, but over time have lost some of the ‘basics’ needed to teach at secondary level;
- those who have studied a degree related to mathematics, rather than an exact match;
- those who have changed career and may have a related degree with a lot of knowledge; and
- specifically supporting programmes which allow trainees to teach maths to GCSE and level 3.

The programme guide is available at http://tinyurl.com/qypgrfe

Maths Hubs

The Department for Education recently announced £11 million to fund around 30 Maths Hubs to support schools and colleges to achieve excellence in maths from primary through to 16-18 education. The Department is seeking exceptional schools with strong vision and proven leadership in maths education to apply to lead a Maths Hub. Schools which meet the eligibility criteria and have a strong track record of working in partnership with other schools to
support their improvement were invited to submit expressions of interest by Wednesday 9 April. At this point applications were assessed by an independent judging panel against a range of criteria. Successful applicants were then informed during the week commencing 21 April 2014 about whether they were required to submit a full proposal. The hubs will be operational from the autumn term 2014 If you have any queries regarding the Maths Hubs contact the National Centre for Excellence in the Teaching of Mathematics (NCTM) at mathshubs@nctm.org.uk.

OTHER

RCUK grant holders age and gender data
RCUK age and gender data for grant holders has been published. Information on this and other RCUK diversity projects is available at www.rcuk.ac.uk/funding/diversity/

Royal Society summary diversity report
A summary report of diversity data analysis – A picture of the UK scientific workforce has been published by the Royal Society/ ‘A lack of diversity across the scientific community represents a large loss of potential talent to the UK according to the chair of the Royal Society’s Equality and Diversity Network (EDAN), Professor Edward Hinds FRS’. The report is available at http://tinyurl.com/p58ihn2

Public Attitudes to Science 2014
Public Attitudes to Science (PAS) 2014 is the fifth in a series of studies looking at attitudes to science, scientists and science policy among the UK public. Ipsos MORI conducted the study in partnership with the British Science Association, on behalf of the Department for Business, Innovation and Skills (BIS) and the Economic and Social Research Council (ESRC). The full report is available at http://tinyurl.com/o6r4dvj

Dr John Johnston
Joint Promotion of Mathematics

LMS GRANT SCHEMES

Next Closing Date for Research Grant Applications: 15 May 2014
Applications are invited for the following grants:

Conferences (Scheme 1)
Grants of up to £7,000 are available to provide partial support for conferences held in the United Kingdom. This includes a maximum of £4,000 for principal speakers, £2,000 to support the attendance of research students who are studying at universities in the UK, and £1,000 to support the attendance of participants from Scheme 5 or former Soviet Union countries.

Celebrating new appointments (Scheme 1)
Grants of up to £600 are available to provide partial support for meetings held in the United Kingdom to celebrate the new appointment of a lecturer at a UK university.

Postgraduate Research Conferences (Scheme 8)
Grants of up to £4,000 are available to provide partial support for conferences held in the United Kingdom, which are organised by and are for postgraduate research students.

Visits to the UK (Scheme 2)
Grants of up to £1,500 are available to provide partial support for a visitor to the UK, who will give lectures in at least three separate institutions. Awards are made to the host towards the travel, accommodation and subsistence costs of the visitor.

Research in Pairs (Scheme 4)
Grants of up to £1,200 are available to support a visit for collaborative research either by the grant holder to another institution abroad, or by a named mathematician from abroad to the home base of the grant holder. Grants of up to £600 are available to support a visit for collaborative research either by the grant holder to another institution within the UK, or by a named mathematician from within the UK to the home base of the grant holder.

International Short Visits (Scheme 5)
Grants of up to £3,000 are available to support a visit for collaborative research by a named mathematician from a country in Africa (or countries where mathematics is in a similar position) to the home base of the grant holder. Grants of up to £2,000 are available to support a visit for collaborative research by the grant holder to a country in Africa (or countries where mathematics is in a similar position).

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

• Applications received by 15 May 2014 will be considered at a meeting in June.

• 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 and Elizabeth Fisher (tel: 020 7291 9971/3, email: grants@lms.ac.uk).

• Programme Secretary: Rob Wilson (r.a.wilson@gmnl.ac.uk).

OTHER LMS GRANTS AND FUNDING

Research Workshop Grants
The Society offers grants to support 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. The maximum award is £10,000, but a typical award is in the range £3,000 - £5,000. Applications for partial support of workshops with other sources of support will be considered. Applications should normally be submitted 12 months in advance of the proposed workshop. For further information visit: www.lms.ac.uk/content/research-workshops-grants.

Young British and Russian Mathematicians Scheme
Next Deadline: 15 May 2014

Visits to Russia
Applications are invited from young British postdoctoral 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. Please 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:

• 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).

• A brief CV (no more than one side of A4).

• A brief budget.

• A letter of invitation from the head of 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 accommoda-
tion costs of up to £1,500. Applications should include the following:

* Name and brief CV of the visitor.
* A brief budget
* A brief description of the course of lectures.
* 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 on the LMS website: www.lms.ac.uk/content/international-grants. Applications received by 15 May 2014 will be considered at a meeting in June. Enquiries should be made to the Grants Administrators: Sylvia Daly and Elizabeth Fisher (tel: 020 7291 9971/3, email: grants@lms.ac.uk).

**Spitalfields Days**

Next Deadline: 15 May 2014

Grants of up to £1,000 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 lecture surveys (or other types of lecture accessible to a general mathematical audience) on topics in the field of the symposium. Please see the website for further details: www.lms.ac.uk/content/spitalfields-days.

**Grace Chisholm Young Fellowship**

The Society offers two fellowships of £1,000 (consisting of £500 personal support and £500 contribution to a host institution) each year to mathematicians who need support when their mathematical career is interrupted by family responsibilities, relocation of partner, or other similar circumstance.

These fellowships, named after Grace Chisholm Young, aim to provide some support, making possible some continuous mathematical activity, so enabling the fellow to be in a position to apply for posts when circumstances allow. The Fellowship will give an endorsement of the holder’s status as a mathematician, so that the break in formal employment should not prevent them from resuming a career as a mathematician at a later stage. Please see the website for further details: www.lms.ac.uk/grants/grace-chisholm-young-fellowships.

**Small Grants for Education**

Next Deadline: 31 August 2014

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. Please see the website for further details: www.lms.ac.uk/content/small-grants-education.

**Computer Science Small Grants**

(Scheme 7)

Next Deadline: 15 November 2014

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. 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. Please see the website for further details: www.lms.ac.uk/content/childcare-supplementary-grants.
CLAY RESEARCH FELLOWS

The Clay Mathematics Institute is pleased to announce that June Huh, Miguel Walsh and Alex Wright have been appointed Clay Research Fellows.

June Huh will receive his PhD in 2014 from the University of Chicago under the supervision of Mircea Mustaţă. He applies algebraic geometry and singularity theory to problems in combinatorics and other areas. His recent interests include singularities of projective hypersurfaces, positivity of Chern classes of Schubert varieties, and connections between realizability problems in algebraic geometry and combinatorial geometry. June has been appointed as a Clay Research Fellow for a term of five years beginning 1 July 2014.

Miguel Walsh was born in Buenos Aires, Argentina. He received his Licenciatura’ degree in 2010 from Universidad de Buenos Aires and his PhD from the same institution in 2012, under the supervision of Román Sasyk. During this period he held a CONICET doctoral fellowship. He is currently based at the University of Oxford. His research so far has focused on inverse problems in arithmetic combinatorics, the limiting behaviour of ergodic averages and the problems in arithmetic combinatorics. Miguel has been appointed as a Clay Research Fellow for a term of five years beginning 1 July 2014.

Alex Wright will receive his PhD in 2014 from the University of Chicago under the supervision of Alex Eskin. His recent work concerns dynamics on moduli spaces and special families of algebraic curves that arise in this context. His interests include dynamics, geometry, and especially ergodic theory on homogenous spaces and Teichmüller theory. Alex received his BMath from the University of Waterloo in 2008. Alex has been appointed as a Clay Research Fellow for a term of five years beginning 1 July 2014. For more information, visit www.claymath.org.

LMS HONORARY MEMBER WINS 2014ABEL PRIZE

This year’s Abel Prize has been awarded to the Russian mathematician Professor Yakov G. Sinai, Princeton University, US and Landau Institute for Theoretical Physics, Russian Academy of Sciences, for his ‘fundamental contributions to dynamical systems, ergodic theory, and mathematical physics’. Sinai will be presented with the Prize by HRH Crown Prince Haakon at an award ceremony in Oslo on 22 May 2014.

Sinai has been particularly influential in connecting the world of (dynamical) deterministic systems with the world of probabilistic (stochastic) systems. One of the major developments of 20th century mathematics was the development of a rigorous theory – probability theory – for discussing random or uncertain events. The power of this body of tools and language is now embedded in the fabric of our society, where stochastic differential equations are part of common place modelling in biology, economics and decision making.

Many mathematical results are named after him, including Kolmogorov–Sinai entropy, Sinai’s billiards, Sinai’s random walk, Sinai-Ruelle-Bowen measures and Pirogov-Sinai theory.

Professor Sinai was elected an Honorary Member of the LMS in 1992.

Professor Terry Lyons FRS, President of the LMS, said, “Yakov G. Sinai is a giant who has transformed so much of our understanding of systems that evolve. By considering the simple example of an elastic point bouncing around (billiards) in a convex region he was able to demonstrate how physical systems can convert predictable deterministic behaviour into organised and well understood randomness and so explain the phenomena that has challenged philosophers for generations. He made deep contributions to the study of entropy, or information production, which are vital tools for understanding these systems. This stellar input became a foundation for a stream of work that today we take for granted in underpinning our understanding of dynamical systems and mathematical physics. It is said that his letter in defence of a colleague in the then Soviet Union explains why it was only in 1981, 17 years after submitting his PhD thesis, that he became a professor’. More information is available at www.abelprize.no/

ANNIVERSARY APP

One (of many) ideas for celebrating the 150th anniversary of the LMS is to have an app especially written for the occasion. Are there any mathematicians out there who are secret app writers and who would be interested in taking this on? What would you like to see such an app do? Please contact Stephen Huggett at general.secretary@lms.ac.uk.

LONDON MATHEMATICAL SOCIETY MIDLANDS REGIONAL MEETING

Loughborough University
Monday 16 June 2014

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>2.00 pm</td>
<td>Opening of the meeting</td>
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<tr>
<td>2.30 pm</td>
<td>Werner Müller (Bonn University)</td>
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<tr>
<td>3.00 pm</td>
<td>Gigliola Staffilani (MIT)</td>
</tr>
<tr>
<td>4.00 pm</td>
<td>Tea/Coffee</td>
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<tr>
<td>4.30 pm</td>
<td>Alexander Pushnitski (King’s College London)</td>
</tr>
<tr>
<td>6.00 pm</td>
<td>Wine Reception/Dinner</td>
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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 and to register and to reserve a place at the dinner, please visit http://homepages.lboro.ac.uk/~maeh/waves14/lms14.html. The cost of the dinner will be approximately £35, including drinks.

The meeting forms part of a workshop on Scattering Theory and Wave Equations from 16-18 June 2014. For further details visit: http://homepages.lboro.ac.uk/~maeh/waves14/index.html or contact the organiser (C.Garetto@lboro.ac.uk)

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.
TURING GATEWAY TO MATHEMATICS

Based at the Isaac Newton Institute for Mathematical Sciences (INI) in Cambridge, the Turing Gateway to Mathematics (TGM) is an initiative that recognises and promotes the impact of mathematics on other academic disciplines, society, culture and in the economy, and acts as a national forum where mathematical challenges from other fields can be raised. In short, its intention is to be a gateway through which two-way traffic between academic mathematicians and potential users of mathematics can pass.

While there are synergies and strong ties between INI and TGM, their goals are different: TGM exists to facilitate the flow of existing knowledge and ideas from the mathematical sciences to potential users, whereas INI aspires to organise ground-breaking mathematical research programmes across a wide spectrum of disciplines where rigorous mathematical challenges are to be found.

Launched in March 2013 and named after Alan M. Turing because of his exceptionally wide influence, the TGM aims to play a national role in mathematical knowledge exchange. Here are some examples of its recent activity:

- Mathematics in biology is a very active area for the TGM. In partnership with the National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs www.nc3rs.org.uk/) and EPSRC’s Predictive mOdelling for hEalthcare through Maths (POEMS) network, the TGM is hosting the Annual Maths Study Group to explore mathematical techniques which could negate/reduce reliance on animal experimentation.
- The TGM ran a Mathematics for the Prediction of Financial Risk workshop, featuring speakers from Deloitte, Barclays and the University of Cambridge Statistical Laboratory. In partnership with the Institute and Faculty of Actuaries, the event carried Continuing Professional Development points for insurance practitioners and attracted a range of participants from both insurance and banking.
- Working with GCHQ, the TGM is helping address a need to build UK capacity in post-quantum research over the next few years. This is driven by the realistic possibility that in the medium term the power of quantum computation will have the potential to compromise cyber security systems. The current need is to develop classical cryptographic security into schemes that are resistant to quantum computer attack. A key aim is to further develop UK research and teaching in relevant areas. A two day workshop to explore these issues will take place on 8-9 May 2014 in Cambridge.
- The multi-disciplinary nature of mathematical sciences presents numerous challenges for knowledge exchange activities. Thus, as well as focusing on widening access to mathematics generally, the TGM aims to shorten pathways to impacts, for example in the context of the REF, and strengthen education and training in areas where mathematical skills are needed. The Turing Gateway to Mathematics is not prescriptive about how it addresses these challenges and welcomes all ideas and enquiries. Further information on how to engage with TGM and its upcoming activities can be found at www.turing-gateway.cam.ac.uk/.
THE LONDON MATHEMATICAL SOCIETY
JOINTLY WITH GRESHAM COLLEGE

Wednesday, 21 May 2014
6:00pm at The Museum of London

The Secret Mathematicians
Professor Marcus Du Sautoy, OBE
University of Oxford

From composers to painters, writers to choreographers, the mathematician’s palette of shapes, patterns and numbers has proved a powerful inspiration. Artists can be subconsciously drawn to the same structures that fascinate mathematicians as they hunt for interesting new structures to frame their creative process.

Professor du Sautoy will explore the hidden mathematical ideas that underpin the creative output of well-known artists and reveal that the work of the mathematician is also driven by strong aesthetic values.

ADMISSION FREE
NO RESERVATIONS REQUIRED – FIRST COME, FIRST SERVED

Nearest underground stations: Barbican, St Paul’s, and Moorgate
020 7831 0575 enquiries@gresham.ac.uk www.gresham.ac.uk

BOUNDDED GAPS BETWEEN PRIMES
LMS-CMI Research School
Oxford 22-26 September 2014

Organisers: Ben Green and Roger Heath-Brown (Oxford)

In a spectacular breakthrough, Yitang Zhang proved that there are infinitely many pairs of primes differing by at most 70 million. Due to further advances of Maynard and Tao and the collaborative Polymath Project, 70 million has been reduced to a few hundred. This course will introduce attendees to the mathematics surrounding these developments. There will be four lecture courses:

- Introduction to prime number theory, ζ and L-functions, the prime number theorem (Andrew Granville, Montreal)
- The Bombieri-Vinogradov theorem about distribution of primes in progressions. Introduction to sieve theory (Kannan Soundararajan, Stanford)
- The methods of Goldston, Pintz and Yıldırım and Maynard-Tao (James Maynard, Montreal/Oxford)
- Inputs from algebraic geometry (Emmanuel Kowalski, ETH Zurich)

These lecture courses will be supplemented by tutorial sessions.

Distinguished guest lectures will be given by Terence Tao (UCLA) and Yitang Zhang (University of New Hampshire).

Applications: Research students, post-docs and those working in industry are invited to apply. The closing date for applications is 15 June 2014. For further information, please visit the website: www.claymath.org/events/bounded-gaps-between-primes. Applications should then be made using the registration form available via the Society's website at: www.lms.ac.uk/events/lms-cmi-research-schools.

Fees:
- For participants from outside Oxford (except those working in industry), fees include conference fee, accommodation, meals and conference dinner. PhD students: £150, Early-career researchers: £250. For Oxford University participants, fees include conference fee, lunches and conference dinner only. PhD Students and Early Career Researchers: £100.
- For all other participants (e.g. those working in industry), fee includes conference fee, lunches and conference dinner only. Registration fee: £250. (Accommodation and evening meals can be requested at a further cost of £650.) All UK-based participants must pay their own travel costs. For overseas-based participants, support will be available on application if contribution towards travel costs is required. Fees are not payable until a place on the course is offered but will be due by 1 August 2014.

These Research Schools are co-sponsored by the Heilbronn Institute.
EUROPEAN NEWS

Eminent Russian mathematician detained and fined

The Russian mathematician Victor Vassiliev, member of the Russian academy of sciences and president of the Moscow Mathematical Society, famous for the invention of Vassiliev invariants in knot theory, was arrested in Moscow on 21 February 2014, as participant of a peaceful protest in support of the defendants of the Bolotnaya Square Case; he was released shortly afterwards. On 5 March, Zamoskovoretsky Court in Moscow convicted him guilty of shouting slogans and resisting detention; he will have to pay a substantial fine. Professor Vassiliev denies both charges. Several of his academic colleagues were witnesses on his behalf confirming that the charges are false.

The European Mathematical Society is deeply concerned about the use of the police and the courts against peaceful protest. The society expresses its warm support to Professor Vassiliev. [Source: euro-math-soc.eu/node/4575, 6 Mar 2014]

CIMPA Research Schools

CIMPA is the International Center for Pure and Applied Mathematics, based in Nice, France, is calling for research proposals (Research Schools) for 2016. The aim of CIMPA is to promote international cooperation in higher education and research in mathematics and their interactions as well as related subjects, for the benefit of developing countries. CIMPA organizes research schools of about two weeks in developing countries. The purpose of these schools is to contribute to the research training of the new generation of mathematicians, women and men.

Proposals in applied mathematics or related to applications of mathematics are especially welcome. Proposals in the most mathematically or economically deprived areas are encouraged and will be given priority. It is preferable that a project of a Research School does not coincide with that of a conference. The research schools are organized locally with the help of CIMPA. The deadline for a (non-mandatory) pre-proposal is 15 June 2014, with complete proposals due by 1 October 2014. [Source: www.cimpa-icpam.org/spip.php?rubrique2]

BCAM distinction

BCAM, the Basque Center for Applied Mathematics in Bilbao, has been recognized by the Severo Ochoa program as one of the five Spanish centres that are among the best in the world in their field. The research institutions have been selected among 57 centres which competed for the distinction of excellence that the Spanish State Department for R&D awards in the framework of its program. The ‘Severo Ochoa Centers of Excellence’ accreditation is a subprogram of the State Department for Research, Development and Innovation of the Ministry of Economy and Competitiveness, whose aim is to strengthen excellence in research carried out in Spain in any scientific field. This recognition is valid for four years with a grant of €4 million as set by the call.

The main strategic value provided by the BCAM Research Program is to strengthen the current research and the development of new research lines, in order to provide tools to analyze, understand and reduce as far as possible the complexity of the world that surrounds us. Advanced modeling and simulation techniques that currently allow solving problems of diverse areas (industrial, energy, materials, health, social, ecological, financial) are particularly important in this field. The aim of BCAM is also to transfer its excellence in research in Applied Mathematics to other scientific, technological and industrial agents, contributing in a sustainable manner to XXI century societal challenges. For further information about BCAM see www.bcambc.org. [Source: BCAM press release, 18 Mar 2014]

EMIS Newsletter

The March 2014 edition of the EMS Newsletter is available online (www.ems-ph.org/journals/journal.php?jrn=news). It contains, among many other interesting items, a lively editorial on the Heidelberg Laureate Forum which took place in September 2013. The format of the HLF is a week-long symposium where laureates of the Abel Prize, the Fields Medal (including the Nevanlinna prize) and the ACM Turing Award join with young researchers of undergraduate, graduate, and post-graduate levels. The mathematics laureates present were Sir Michael Atiyah, Gerd Faltings, Curt McMullen, Stephen Smale, Endre Szemérdi, Srinivasa Varadhan, Cédric Villani, Vladimir Voevodski, Avi Wigderson and Efim Zelmanov; moreover, among Turing awardees present there were Ronald Rivest and Adi Shamir; the “RS” from the RSA algorithm), as well as Stephen Cook and Richard Karp, pioneers of complexity theory. UK young mathematicians are strongly encouraged to take part in these remarkable events in future.

ERC President underlines need for frontier research

In a keynote speech at a public hearing in the European Parliament on 12 February 2014, the European Research Council (ERC) President Jean-Pierre Bourguignon highlighted the success of the European Research Council, citing the ERC as proof that the European Union can make a difference. The presentation, which took place in the Committee on Industry, Research and Energy (ITRE), turned the spotlight on ‘The European Research Area - from Framework Programme 7 to Horizon 2020’. At this hearing Professor Bourguignon spoke about ‘The ERC under Horizon 2020: Why do we need, and how can we achieve, excellent fundamental and frontier research in Europe?’ He acknowledged the role of the scientific community in initiating the ERC, as well as the subsequent support from national governments, the European Commission, and the European Parliament, which he praised for its “brave decision to support basic research”. He also took the occasion to touch on the substantial budget increase the ERC has received for the next seven years, which he said will enable the organisation to develop further.

Asked about the need to harmonise rules and procedures in research within the EU member states, Professor Bourguignon stated that uniformity is not the answer, compatibility is the key. “For scientists, political boundaries do not exist - the quality of work is more important than the procedures”, he said. In his opinion, “the European Research Area can be the common denominator for the multitude of instruments and institutions currently supporting research”. [Source: edited from ERC document available at http://erc.europa.eu. The hearing can be viewed at http://vimeo.com/86522607]

Turkish Mathematical Society

Last September, the Turkish Math Society called its members for a special General Assembly. The main item in the meeting was the EMS Code of Practice and its dissemination in the Turkish Math community. Before the meeting, the Code and its Turkish translation was shared and discussed with the members. The response to the Code was very positive, and it was accepted unanimously in the General Assembly. [Source: EMS e-News, 10 February 2014]

Marie Skłodowska-Curie Actions Programme

The European Commission has issued a call for Individual Fellowships (IF) under the Marie Skłodowska-Curie Actions Programme. IFs provide opportunities to acquire and transfer new knowledge and to work on research in a European context (EU Member States and Associated Countries) or outside Europe. The scheme particularly supports the return and reintegration of researchers from outside Europe who have previously worked here. It also develops or helps to restart the careers of individual researchers that show great potential, considering their experience, and provides opportunities to acquire and transfer new knowledge. Deadline: 11 September 2014. [Source: euro-math-soc.eu/node/4635, 19 Mar 2014]

David Chillingworth LMS/EMS Correspondent
LSD & LAW 2014

Report
The annual London Stringology Days and London Algorithmic Workshop (LSD & LAW) was hosted at King’s College London from 6 to 7 of February 2014. A total of 60 participants (15 women) from different institutions and universities around the world attended this two day meeting, and 25 talks in eight sessions were given by various participants. Professor Michael Luck, Head of School of Natural and Mathematical Sciences at King’s College London welcomed the participants.

The talks covered many aspects of mathematics, theoretical or applied, including: combinatorics on words; algorithms on words; graph and tree algorithms; data compression; bioinformatics; computational complexity; and automata theory.

Talks on algorithms on words were given by Amihood Amir (Israel) and Christian Kolberg (France) and Tomas Flouri (Germany); on graph algorithms by Moez Draief (UK), Robert Elsaesser (Austria) and Mohammed Amin Abdullah (UK); and on bioinformatics by Nadia Pisanti (Italy), Laurent Mouchard (France) and Tomas Flouri (Germany); on graph algorithms by Moez Draief (UK), Robert Elsaesser (Austria) and Mohammed Amin Abdullah (UK); and on combinatorics and algorithms on words by Zsuzsanna Liptak (Canada) and Wojciech Rytter (Poland).

The following are details of two of the many excellent talks.

Computing k-th Lyndon word and decoding lexicographically minimal de Bruijn sequence, was given by Dr Jakub Radoszewski (University of Warsaw). A Lyndon word on alphabet A is a word that is strictly smaller in lexicographic order than all of its rotations. Dr Radoszewski presented polynomial-time methods for computing the k-th in the lexicographic order Lyndon word of a given length n on A. A de Bruijn sequence is a cyclic sequence of a given alphabet A for which every possible subsequence of length m in A appears as a sequence of consecutive characters exactly once. Dr Radoszewski used the connections between Lyndon words and minimal de Bruijn sequences to devise the first polynomial-time method for decoding minimal de Bruijn sequence of any rank r; it determines the position of an arbitrary word of length r within the de Bruijn sequence.

Global majority consensus by local majority polling on graphs of a given degree sequence, was given by Dr Mohammed Amin Abdullah (University of Birmingham). Suppose in a graph G vertices can be either red or blue. Let k be odd. At each time step, each vertex v in G polls k random neighbours and takes the majority colour. Dr Abdullah studied this protocol on graphs of a given degree sequence, in the setting where each vertex is initialised red independently with fixed probability p < 1/2 and is otherwise blue. Dr Abdullah showed that, with high probability consensus is reached on the initial global majority within time O((log log n)), where n is the number of vertices in the graph. This is subject to certain restrictions on the degree sequence and sufficient bias in p. Dr Abdullah further showed that on such graphs, any local protocol in which a vertex does not change colour if all its neighbours have that same colour, has a matching lower bound.

Costas Iliopoulos and Solon Pissis were the co-chairs of the Organizing Committee. The meeting was supported by an LMS Conference grant and the Department of Informatics at King’s College London. A Special Issue of the Journal of Discrete Algorithms with selected contributions from the LSD & LAW 2014 meeting is currently being organised by the co-chairs of the Organising Committee. More information about this meeting can be found at www.inf.kcl.ac.uk/events/LSD&LAW14.

MARY CARTWRIGHT LECTURE 2014

Report
This year’s Mary Cartwright Lecture took place at the York Centre for Complex Systems Analysis (YCCSA) at the University of York on 28 February 2014. The overall theme of the day was Symmetry in Science. The opening lecture on Moonshines was delivered by Anne Taormina from Durham University. Particular emphasis was put on the recent discovery of Mathieu Moonshine, a phenomenon linking information encoded in a mock modular form that naturally appears in the theory of superstrings propagating on K3 surfaces, and the sporadic group Mathieu 24. How this huge symmetry group acts within the string theory remains a mystery and has captured the interest of theoretical particle physicists, algebraic geometers, number and group theorists.

The Mary Cartwright Lecture was given by Reidun Twarock on Viruses and Geometry: Hidden Symmetries in Virology. It showed that mathematical tools from group, graph and tiling theory can be used to better understand structural constraints on viruses and provide a new perspective on how viruses form, evolve and infect their hosts. Reidun showed that these new mathematical tools also apply to nested carbon cage structures called fullerenes, and she demonstrated how they can be used
to address open problems in bionanotechnology. She also reported on recent models that have enabled the discovery of a mechanism in virus assembly in collaboration with her experimental collaborator Peter Stockley from the Astbury Centre for Structural Molecular Biology in Leeds, that has inspired the development of a novel anti-viral strategy against single-stranded RNA viruses.

The talks were complemented by an exhibition of polyhedral art and design by Briony Thomas of Leeds, who is currently spending her sabbatical at YCCSA. Briony frequently showcases her work at conferences on mathematics and art, such as the Bridges conferences, and organizes exhibitions dedicated to mathematical art. She also develops material from these exhibitions to contribute to school outreach programmes.

The meeting was well attended by students, postdocs and staff and stimulated lively discussions among participants. It was opened by Ken Brown, Vice President of the LMS, and the speakers were introduced by Gwyneth Stallard, the chair of the LMS’s Women in Mathematics Committee.

Photographs from the conference can be found on the back cover of this Newsletter.

Reidun Twarock
University of York

RECENT ADVANCES IN NONLINEAR PDE AND CALCULUS OF VARIATIONS

Report

The Department of Mathematics and Statistics of the University of Reading, jointly with the Oxford Centre for Nonlinear PDE and Calculus of Variations, is pleased to announce that a successful event was held at the University of Reading from 12 to 14 February 2014. The organiser was Nicholas Katzourakis (University of Reading) and Gregory Seregin (University of Oxford). The event was partially financially supported by an LMS Conference grant to celebrate new appointments. Financial support from Oxford was also in the context of a similar grant awarded to new academic staff members recently appointed to permanent UK positions in a University. In both cases, the grant was awarded to the organiser Nicholas Katzourakis of the University of Reading.

This event was one of the first of its kind held in the UK and in particular in Reading. The event brought together famous experts of several origins employed in several countries and working on different aspects of Nonlinear Partial Differential Equations and Calculus of Variations, in order to discuss the latest developments in these two interconnected disciplines.

The main focus was on the following topics: vector-valued and scalar calculus of variations for integral functionals, nonlinear elasticity, convex integration, Young measures, vector-valued and scalar calculus of variations for supremal functionals, homogenisation, probabilistic and game-theoretic methods in PDE, fully nonlinear elliptic PDE, subelliptic PDE, water waves and free boundary problems, theoretical numerical methods for fully nonlinear PDE, and more.

The speakers were: Nicholas Alikakos (Athens, Greece), Sir John Ball (Oxford, UK), Bernard Dacorogna (Lausanne, Switzerland), Nicolas Dirr (Cardiff, UK), Georg Dolzmann (Regensburg, Germany), Federica Dragoni (Cardiff, UK), Petri Juutinen (Jyväskylä, Finland), Nicholas Katzourakis (Reading, UK), Kostantinos Koumatos (Oxford, UK), Juha Kinnunen (Aalto, Finland), Jan Kristensen (Oxford, UK), Juan Manfredi (Pittsburgh, USA), Francesca Prinari (Ferrara, Italy), Tristan Pryer (Reading, UK), Filipp Rindler (Warwick, UK), Ali Taheri (Sussex, UK), Eugen Varvaruca (Reading, UK) and Igor Velčič (Zagreb, Croatia). Robert Jensen (Chicago, USA) and Changyou Wang (Kentucky, USA) were in the original list of speakers but eventually cancelled for personal reasons.

The atmosphere during the event was very relaxed and pleasant. On each of the three days there were six 45-minute talks and one poster-discussion session. In between all the talks were large breaks of 15-45 minutes and plenty of coffee available all day long. All speakers and participants received vouchers for free lunch that could be utilised in all the eating places in the Whiteknights Campus of the University of Reading, and also LMS registration packs. The workshop dinner was held in one of the best eating places in the town centre of Reading, with free buffet consisting of 150 different dishes of 10 plus different origins.

There were more than 40 people present on all three days. All the speakers and participants enjoyed this high-class very successful event and informal discussion took place for the possibility to hold a series of such international scientific events in Reading.

Nicholas Katzourakis
University of Reading

VISIT OF ROBERT GILMAN

Professor Robert Gilman (Algebraic Cryptography Center, Stevens Institute of Technology, USA) will be visiting the UK from 28 May to 9 June 2014. His expertise is in geometric and combinatorial group theory, including connections between languages, automata and group theory, and equations in groups. During his visit Professor Gilman will give lectures at:

• University of Warwick, Thursday 29 May
  (contact Derek Holt: d.f.holt@warwick.ac.uk)
• University of St Andrews, Wednesday 4 June
  (contact Tara Brough: t.brough@st-andrews.ac.uk)
• University of Newcastle, Friday 6 June
  (contact Sarah Rees: sarah.rees@ncl.ac.uk)

Further details about the visit can be obtained from Tara Brough (t.brough@st-andrews.ac.uk). The visit is supported by an LMS Scheme 2 grant.

VISIT OF CONALL KELLY

Dr Conall Kelly (The University of the West Indies, Mona campus, Kingston, Jamaica) will visit the UK in June 2014. His interests lie in the area of stochastic differential and difference equations, including numerical methods for stochastic systems. During his visit Dr Kelly will give lectures at:

• The University of Manchester during the week of 2-16 June
  (contact Sergei Fedotov: sergei.fedotov@manchester.ac.uk)
• The University of Nottingham, 11 June
  (contact Marco Iglesias: mmarco.iglesias@nottingham.ac.uk)
• University of Bath, 13 June
  (contact Tony Shardlow: tony.shardlow@bath.edu)

Further details, when available, can be obtained from Professor Sergei Fedotov, or one of the other contacts listed above. The visit is partially supported by an LMS Scheme 2 grant.
VISIT OF ALEKSEY KOSTENKO

Dr Aleksey Kostenko (Faculty of Mathematics, University of Vienna, Austria) will be visiting the UK from 8 to 24 May 2014. His expertise is in mathematical physics, spectral theory and inverse spectral problems. During his visit Dr Kostenko will give lectures at:

- University of Leeds, School of Mathematics, Friday 9 May, *An isospectral problem for global conservative solutions of the Camassa-Holm equation* (contact Alexander Mikhailov: A.V.Mikhailov@leeds.ac.uk)
- Cardiff University, School of Computer Science and Informatics, Monday 12 May, *Indefinite Sturm-Liouville spectral problems and the HELP inequality* (contact Malcolm Brown: Malcolm.Brown@cs.cardiff.ac.uk)
- University of Essex, Department of Mathematical Sciences, Thursday 22 May, *The Camassa-Holm equation and the inverse spectral transform method* (contact Georgi Grahovski: grah@essex.ac.uk)

Dr Kostenko will also attend the two-day workshop *Spectral Analysis and Differential Equations* (a memorial meeting to Professor W.N. Everitt) which will be held at Cardiff University from 15 to 17 May 2014 (www.cs.cf.ac.uk/everittmemorial).

Dr Kostenko will be based at the Department of Mathematical Sciences, University of Essex, Colchester. For further information contact Georgi Grahovski (grah@essex.ac.uk). The visit is supported by an LMS Scheme 2 grant.

VISIT OF VASSILIS ROTHOS

Dr Vassilis Rothos (Aristotle University of Thessaloniki, Greece) will visit the UK in June 2014. His interests include localised waves and coherent structures in spatially discrete differential equations. During his visit Dr Rothos will give lectures at:

- Imperial College London, 4 June at 3 pm *Bifurcation of travelling waves in implicit nonlinear lattices: Applications in magnetic metamaterials*
- University of Surrey, 6 June at 4 pm *Localized structures in nonlocal media*
- Loughborough University, 11 June at 1 pm *Nonlinear localization in rf-SQUID metamaterials*

Further details about the visit and talks can be obtained from Hadi Susanto (hsusanto@essex.ac.uk). The visit is supported by an LMS Scheme 2 grant.

FILTERING HIGH DIMENSIONAL COMPLEX SYSTEMS

This meeting will take place at the University of Warwick from Monday 30 June to Wednesday 2 July 2014. The meeting will be focussed on the role of mathematics within a subject area that has been driven, to a large extent, by application areas arising in the geophysical sciences, in particular numerical weather prediction, oceanography and oil recovery. Whilst these engineering applications are of enormous practical importance, the mathematical analysis of filtering algorithms for such high dimensional complex systems is in its infancy. The speakers are:

- Marc Bourquet (CEREA)
- Mikael Branicki (Edinburgh)
- Mike Fisher (ECMWF)
- Ian Grooms (NYU)
- Ibrahim Hoteit (KAUST)
- Kayo Ide (UMD)
- Andy Majda (NYU)
- Kody Law (KAUST)
- Maelle Nodet (INRIA)
- Sebastian Reich (Potsdam)
- Andrew Stuart (Warwick)
- Peter Jan Van Leeuwen (Reading)

The meeting is supported by an LMS Conference grant from which there is some funding for UK-based graduate students. To register visit the website at http://tinyurl.com/pqv7h6c.
GROUPS IN GALWAY 2014

A two-day meeting on group theory and related topics will be held at National University of Ireland, Galway, from Friday 23 to Saturday 24 May. The speakers include:

- Philippe Elbaz-Vincent (Université Grenoble)
- Herbert Gangl (Durham University)
- Kevin Hutchinson (University College Dublin)
- Radha Kessar (City University London)
- Grant Lakeland (University of Illinois at Urbana-Champaign)
- Markus Linckelmann (City University London)
- Jacques Thévenaz (EPFL)

Further information can be found at the conference homepage www.maths.nuigalway.ie/conferences/gig14/ or contact the organizers Alexander Rahm (alexander.rahm@nuigalway.ie) or Sejong Park (sejong.park@nuigalway.ie).

POSTGRADUATE GROUP THEORY CONFERENCE 2014

The 16th Postgraduate Group Theory Conference (PGTC) will be held at the University of Birmingham from 24 to 27 June 2014. The PGTC is an annual student-organised conference which aims to bring together postgraduate students working in mathematics and who have an interest in group theory. All are welcome.

The highlights of the conference will be plenary lectures by Radha Kessar (City University London) and Andrea Lucchini (University of Padua). The main conference will consist of talks by contributed by participants as well as a poster session. The environment is intended to be relaxed and stimulating. It will be an ideal opportunity to meet other students whose PhD studies are centred on group theory.

Registration is via the website at http://web.mat.bham.ac.uk/pgtc14/. The meeting is supported by an LMS Postgraduate Research Conference Scheme 8 grant and by the School of Mathematics of the University of Birmingham.

YOUNG RESEARCHERS IN MATHEMATICS 2014

The University of Warwick will be hosting the 6th annual Young Researchers in Mathematics (YRM) conference from 30 June to 3 July 2014. This popular event is open to postgraduate students and postdocs working in all areas of mathematics. YRM gives young mathematicians a chance to meet their peers from other universities and to learn about research in their area of expertise.

This year there are two plenary speakers: Iain Stewart (Warwick) and Jeremy Gray (Open University) and 14 tracks: Algebra, Algebraic Geometry, Analysis and PDEs, Combinatorics, Differential Geometry, Dynamical Systems, Financial Maths and Stochastic Analysis, Fluid Mechanics, Maths and Physics, Maths and Biology, Number Theory, Probability, Set Theory and Logic, and Topology.

The majority of talks will be given by the postgraduate delegates. This is a great opportunity for students to give talks about their research in front of an enthusiastic audience. Talk abstracts and posters proposals should be submitted during registration. For further information and to register, please see the conference webpage: www.warwick.ac.uk/yrm2014.

The conference is supported by an LMS Postgraduate Research Conference Scheme 8 grant, the Heilbronn Institute and Winton Mathematical Research Institute.

LMS-WIMCS ANALYSIS DAY

An LMS-WIMCS Analysis Day (second workshop in the series) will take place at the Department of Mathematics and Physics, Aberystwyth University, on Wednesday 7 May 2014 from 10:00 - 17:30. The meeting, which is open to all, will highlight topics in applications of analysis, including materials science. The speakers are:

- Kirill Cherednichenko (Cardiff)
- Norman Dancer (Swansea and Sydney)
- Nicolas Dirr (Cardiff)
- Apala Majumdar (Bath)
- Angela Mihai (Cardiff)

For further information visit the meeting webpage at http://f7.imaps.aber.ac.uk/wimcs_aaber. To register send an email by 5 May 2014 to Gennady Mishuris (ggm@aber.ac.uk) with your name, affiliation and whether or not you wish to stay for dinner.

The meeting is supported by an LMS Joint Research Groups in UK Scheme 3 grant and the Wales Institute of Mathematical and Computational Sciences.

CLAY RESEARCH CONFERENCE AND WORKSHOPS

The 2014 Clay Research Conference will be held 1 October at the Mathematical Institute of the University of Oxford. The speakers are:

- Ben Green (Oxford)
- Jonathan Pila (Oxford)
- Paul Seidel (MIT)
- Scott Sheffield (MIT)

The recipient of the 2014 Clay Research Award will be announced at the conference. Presented annually, the Clay Research Award celebrates outstanding achievements in mathematical research.

Associated workshops will be held throughout the week of the conference:

- Advances in Probability (Ivan Corwin and Martin Hairer), 28 September – 2 October
- Analytic Number Theory (Ben Green and Roger Heath-Brown), 29 September – 3 October
- Functional Transcendence around Ax–Schanuel (Jonathan Pila and Alex Wilkie), 29 September – 3 October
- Symplectic Topology (Dominic Joyce, Alexander Ritter, and Ivan Smith), 29 September – 3 October

Registration to the Clay Research Conference is free but required. Participation in the workshops is by invitation; a limited number of additional places are available.

The 5th annual Young Researchers in Mathematics (YRM) conference, held in Galway in June 2014, was supported by the Clay Research Conference and the University of Warwick. The 2015 Clay Research Conference will be held in June 2015 at the Heilbronn Institute for Mathematical Research, University of Bristol.

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The conference is supported by an LMS Postgraduate Research Conference Scheme 8 grant, the Heilbronn Institute and Winton Mathematical Research Institute.

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- Kirill Cherednichenko (Cardiff)
- Norman Dancer (Swansea and Sydney)
- Nicolas Dirr (Cardiff)
- Apala Majumdar (Bath)
- Angela Mihai (Cardiff)

For further information visit the meeting webpage at http://f7.imaps.aber.ac.uk/wimcs_aaber. To register send an email by 5 May 2014 to Gennady Mishuris (ggm@aber.ac.uk) with your name, affiliation and whether or not you wish to stay for dinner. The meeting is supported by an LMS Joint Research Groups in UK Scheme 3 grant and the Wales Institute of Mathematical and Computational Sciences.

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Registration to the Clay Research Conference is free but required. Participation in the workshops is by invitation; a limited number of additional places are available.

The 5th annual Young Researchers in Mathematics (YRM) conference, held in Galway in June 2014, was supported by the Clay Research Conference and the University of Warwick. The 2015 Clay Research Conference will be held in June 2015 at the Heilbronn Institute for Mathematical Research, University of Bristol.

RANDOM INTERACTING SYSTEMS

A school and workshop on Random Interacting Systems will take place from 23 to 27 June 2014 at the University of Bath. It will focus on recent developments on random interacting systems, including (but not restricted to) interacting and self-interacting particle systems, random walks and other stochastic processes in random environments, random and evolving graphs, the Gaussian free field, random interlacements, random polymers, percolation and spin systems.

The meeting will comprise the following two mini-courses:

- Hugo Duminil-Copin (Université de Genève) Geometric representations of low-dimen-

sion spin systems
- Christophe Garban (ENS Lyon) Lectures around Liouville quantum gravity and multiplicative chaos theory

and invited talks by the following speakers:

- Kenneth Alexander (University of Southern California)
- Gérard Ben-Arous (Courant Institute of Mathematical Sciences)
- Nathanael Berestycki (University of Cambridge)
- Ivan Corwin (MIT)
- David Croydon (University of Warwick)
- Nadine Guillotin-Plantard (Univ Lyon 1)
- Ori Gurel-Gurevich (Hebrew University of Jerusalem)
- Frank den Hollander (Universiteit Leiden)
- Neil O’Connell (University of Warwick)
- Ron Peled (Tel Aviv University)
- Alejandro Ramírez (Pontificia Universidad Católica de Chile)
- Perla Sousi (University of Cambridge)
- Rongfeng Sun (National University of Singapore)
COMBINATORICS IN OXFORD

A one-day meeting in combinatorics will be held in Oxford on 5 June 2014. The meeting will take place in the Mathematical Institute, with talks starting at 11am and coffee available beforehand from 10.30 am. This year’s speakers are:

- Jacob Fox (MIT)
- Jeff Kahn (Rutgers)
- Gil Kalai (Jerusalem)
- Rob Morris (IMPA)
- Angelika Steger (ETH Zurich)

Anyone interested is welcome to attend. Some funds may be available to contribute to the expenses of research students who wish to attend the meeting. Further details can be obtained from the web page at http://tinyurl.com/3zyrf2d. The meeting is supported by an LMS Conference grant and the British Combinatorial Committee.

MAGNETOHYDRODYNAMICS

The 2014 UK National Conference on Geophysical, Astrophysical and Industrial Magnetohydrodynamics will take place at Department of Mathematical Sciences, University of Exeter, from 22 to 23 May 2014. The conference is a medium-sized, single-thread meeting of the UK Magnetohydrodynamics research community. It is expected that the conference would be involved between 60 and 80 participants with a number of international participants.

The meeting will start around 10:00 am on Thursday 22 May and close on Friday afternoon 23 May 2014. The invited speakers include:

- Paul Roberts (UCLA)
- David Gubbins (University of Leeds)

In addition, there will be shorter presentations (15-20 minutes) by young researchers disseminating their research results as well as a poster session. The website for the registration and further information is located at http://tinyurl.com/pstuowjt with the deadline for registration of 15 May 2014.

The 2014 UK MHD conference is supported by an LMS Conference grant and a STFC grant. There is some limited funding available to support the travel of PhD students to Exeter. If you have any questions regarding this conference such as requesting travel funds please send an email to ukmhd2014@exeter.ac.uk.

MATHEMATICAL MODELLING OF BIOLOGICAL AND CULTURAL EVOLUTION

The meeting Mathematical Modelling of Biological and Cultural Evolution will take place in the Department of Mathematics at City University London on Friday 13 June 2014. The focus of the meeting will be on mathematical modelling of evolutionary dynamics and complexity. Confirmed speakers are:

- Stephen Cornell (University of Liverpool)
- Henrik Jensen (Imperial College London)
- Anne Kandler (City University London)

There is a £10 registration fee. Some funding is available to contribute to the travel expenses of research students. For more information, including how to register, contact the organiser, Anne Kandler by email (anne.kandler.1@city.ac.uk). The meeting is supported by an LMS Conference grant.

Please send an email to exeter-mhd2014@exeter.ac.uk for information, including how to register, contact the organiser, Anne Kandler by email (anne.kandler.1@city.ac.uk). The meeting is supported by an LMS Conference grant.
Isaac Newton Institute for Mathematical Sciences

**PRINCIPLES & APPLICATIONS OF CONTROL TO QUANTUM SYSTEMS**

**4 – 8 August 2014**

in association with the Newton Institute programme

Quantum Control Engineering: Mathematical Principles and Applications

21 July – 15 August 2014

Organisers: John Gough (Aberystwyth)

International program committee members: Hideo Mabuchi (Stanford), Yuxi Liu (Tsinghua), Hendra Nurdin (New South Wales) and Mazyar Mirrahimi (INRIA)

The 21st Century has witnessed a significant advancement in our capacity to exercise control over quantum systems and to harness their specifically non-classical resources: complementary to this has been a fundamental shift in theory towards an engineering focussed perspective. Quantum control has already lead to significant improvements in technologies ranging from magnetic resonance to prototype quantum computers, from quantum high-precision sensors to quantum logic clocks, from single atom transistors to quantum noise suppression in gravitation wave detectors. The recent Nobel prize-winning works of Haroche and Wineland are both underpinned by dedicated control theoretic principles. We are at the formative stages of a 21st Century’s industrial revolution centred around Quantum Technology, and it is natural to view quantum control engineering as an essential framework behind its development, crucial to problems of design, stabilization, error-correction, noise reduction and filtering, and combating decoherence.

This is the ninth international workshop on Principles and Applications for Control of Quantum Systems. Our aim is to bring together researchers in mathematics, physics, control theory, dynamical systems, stochastic processes, signal processing and information science to strengthen the community of quantum control.

As in previous workshops, all lectures will be from invited speakers, which will present recent developments at the forefronts of theoretical research, experimentation and motivating applications.

A poster session will be held during the meeting; participants can submit a title/abstract from the Registration page (details about poster sizing will be sent later by email).

Closing date of the receipt of applications is **25 May 2014**.

Further information and application forms are available from the website at:

www.newton.ac.uk/programmes/FRB/frbw04.shtml

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**TWO ONE-DAY COLLOQUIA IN COMBINATORICS 2014**

Two linked one-day colloquia in combinatorics will be taking place in London. The first day will be held at Queen Mary, University of London, on Wednesday 14 May and the second will take place at the London School of Economics and Political Science on Thursday 15 May. It is hoped that the talks will be of wide interest to all those working in combinatorics or related fields. The schedule is as follows:

**Queen Mary, University of London (14 May)**

Maths Lecture Theatre, Mathematical Sciences Building
- Ben Barber (Birmingham)
  - Partition regularity without the columns property
- Ehud Friedgut (Rehovot)
  - Combinatorial problems in the symmetric group, stability and quasi-stability
- Vytautas Gruslys (Cambridge)
  - Orientations of hypergraphs and sparse Ramsey theory
- Peter Keevash (Oxford)
  - The existence of designs
- Konrad Swanepoel (London)
  - Counting double-normal pairs in Euclidean space
- Miklős Simonovits (Budapest)
  - Stability methods, supersaturated graphs, phase transitions

**London School of Economics (15 May)**

New Theatre, East Building
- József Balogh (Szeged and Urbana)
  - On the typical structure of sum-free sets
- Peter Cameron (St Andrews)
  - Combinatorial problems from transformation semigroups
- Penny Haxell (Waterloo)
  - Extremal graphs for connectedness
- Diana Piguet (Birmingham)
  - An approximate version of the tree packing conjecture for bounded degree graphs
- Pavel Valtr (Prague)
  - Happy ending theorem and some related questions and results

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**CATEGORY THEORY 2014**

The meeting Category Theory 2014 will take place in the Centre for Mathematical Sciences at the University of Cambridge, from Sunday 29 June to Saturday 5 July 2014. This conference is the main annual meeting in the mathematical area of Category Theory. It is a truly international meeting with recent venues including Sydney (2013), Vancouver (2011), Genova (2010), Cape Town (2009), and Calais (2008). In Cambridge, the conference will comprise a full programme of talks over six consecutive days, including six presentations by invited speakers and talks in plenary and parallel sessions. The invited speakers are:

- Maria Manuel Clementino (University of Coimbra, Portugal)
- Martin Hyland (University of Cambridge, UK)
- Joachim Kock (Autonomous University of Barcelona, Spain)
- Steve Lack (Macquarie University, Sydney)
- Jaap van Oosten (University of Utrecht, Netherlands)
- Angelica Osorno (Reed College, Portland, USA)

The standard registration fee is £150 until 29 May (and £170 afterwards), while the fee for research students is £110 (£130 after 29 May). Registration will close on 12 June 2014. The meeting is supported by an LMS Conference grant and the British Combinatorial Committee.

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London Mathematical Society for help with childcare costs. Further details can be found on their website www.lms.ac.uk/content/childcare-supplementary-grants. The meeting is supported by an LMS Conference grant and the British Combinatorial Committee.
Grant. Some funding is available to contribute to accommodation expenses of research students, in particular those at UK universities. For more information, including how to register, see the conference website www.ct2014.dpmms.cam.ac.uk.

RINGS OF DIFFERENTIAL AND INTEGRAL OPERATORS

The meeting Rings of Differential and Integral Operators will take place at Plymouth University on Thursday 5 June 2014. It will focus on algebraic aspects of differential equations, integro-differential equations and boundary value problems. Confirmed speakers are:

- Vladimir Bavula (University of Sheffield, UK)
- Alban Quadrat (Inria Saclay, France)
- Markus Rosenkranz (University of Kent, UK)

For more information visit the website at www.tech.plym.ac.uk/Research/applied_mathematics/LMS_Robertz.html or contact the organiser, Daniel Robertz (daniel.robertz@plymouth.ac.uk). The meeting is supported by an LMS Conference grant.

MOST 2014

The Mathematics of String Theory (MOST) workshop will take place from 2 to 3 June 2014 at King’s College London. The goal of this workshop is to bring together mathematicians and theoretical physicists working on ideas related to string theory and supersymmetric quantum field theory. There has been a long and fruitful history in the interplay between mathematics and physics. Many ideas in physics have led to new and exciting developments in mathematics. Conversely, mathematics has led to new powerful techniques that have rendered many problems in string theory soluble.

The workshop intends to bring together researchers working at the intersection between these two fields to summarise current developments and explore future research directions. The meeting will allow for plenty of time for discussions. Speakers include:

- Tom Bridgeland (Sheffield)
- Xenia de la Ossa (Oxford)
- Tudor Dimofte (IAS)
- Joel Fine (Brussels)
- Mark Gross (Cambridge)
- Lotte Hollands (Oxford)
- David Skinner (Cambridge)
- Richard Thomas (Imperial)

For information and questions about the workshop contact Sakura Schaefer-Nameki (sakura.schaefer-nameki). Closing date for registration and payments is 19 May 2014. Information is available from the website at: www.mth.kcl.ac.uk/~ss299/MOST. The workshop is supported by an LMS Conference grant.

ACTIVITIES ON SYMMETRIES AND CORRESPONDENCES

Activities on Symmetries and Correspondences in number theory, geometry, algebra and quantum computing: intra-disciplinary trends will take place from 3 to 10 July in Nottingham and Oxford. They include a workshop and a conference.

Recent work in arithmetic, functional, geometric and modular Langlands correspondences, non-commutative summation formulas, new developments in anabelian geometry, higher adeles and zeta integrals for arithmetic schemes, dualities on arithmetic surfaces, equivariant arithmetic geometry, higher commutative summation formulas, as well as related work in representation theory, algebraic analysis, geometry, K-theory, integrable systems and archimedean L-functions, the study of interaction with mirror symmetry, TQFT and quantum computation reveal new intra-disciplinary fundamental structures and striking perspectives.

Talks at the Oxford conference from 5 to 10 July will be of a more general, overview and instructional nature, describing new trends and connections with quantum chaos. Among the areas addressed during the workshop will be in particular connections between dynamics on homogeneous spaces and Diophantine geometry; exponential sums, dynamics on nilmanifolds and higher order correlations; periodic orbits, period integrals and L-functions including connections with quantum chaos.

Closing date of the receipt of applications is 25 May 2014. Further information and application forms are available from the website at: www.newton.ac.uk/programmes/GAN/ganw01.shtml

GROUPS, NUMBERS, AND DYNAMICS

30 June – 4 July 2014

in association with the Newton Institute programme Interactions between Dynamics of Group Actions and Number Theory

9 June – 4 July 2014

Workshop organisers: Anish Ghosh (East Anglia), Alexander Gorodnik (Bristol) and Barak Weiss (Ben Gurion University of the Negev).

Aim: to bring together researchers working in number theory, group theory and the theory of dynamical systems to discuss problems arising at the interface of arithmetic and dynamics of group actions. In recent years several promising connections between these fields has been discovered that resulted in striking breakthroughs.

Among the areas addressed during the workshop will be in particular connections between dynamics on homogeneous spaces and Diophantine geometry; exponential sums, dynamics on nilmanifolds and higher order correlations; periodic orbits, period integrals and L-functions including connections with quantum chaos.
SYMMETRIES IN GRAPHS, MAPS AND POLYTOPECES

The 5th SIGMAP Workshop, Symmetries in Graphs, Maps and Polytopes, will take place from 7 to 11 July 2014 at the ELIM Conference Centre, West Malvern. The aim of the workshop is to continue the SIGMAP series and give the worldwide community of researchers in symmetries of discrete objects and structures the opportunity to gather together, exchange information and present their newest findings. It is expected to set up a new momentum for this community and further enhance research into important connections between embedded graphs, Riemann surfaces, dessins d’enfant and Galois theory by including a mini-course on these topics. The invited speakers are:

- Marston Conder (University of Auckland)
- Shaofei Du (Capital Normal University, Beijing)
- Gareth Jones (University of Southampton)
- Cai Heng Li (University of Western Australia)
- Aleksander Mednykh (Novosibirsk State University)
- Roman Nedela (Matej Bel University, Slovakia)
- Primoz Potocnik (University of Ljubljana)
- David Singerman (University of Southampton)
- Asia Ivić Weiss (York University, Toronto)
- Jurgen Woltz (J.W. Goethe University, Frankfurt)

Gareth Jones, David Singerman and Jurgen Woltz will give a mini-course on connections between maps, Riemann surfaces and dessins d’enfant in their invited lectures scheduled for the morning of Wednesday 9 July.

For further information visit the website at http://mcs.open.ac.uk/SIGMAP/ or contact the organiser Jozef Siran (jozef.siran@open.ac.uk). The workshop is supported by an LMS Conference grant.

MEMBERS’ OPINIONS ...... have your say

All opinions submitted to this section are strictly those of the contributor and do not necessarily represent the views of the London Mathematical Society. If you would like to respond to any of the opinions published below, or have a separate contribution which you would like published on matters relevant to mathematics please contact newsletter@lms.ac.uk. Items are accepted at the discretion of the Editor and subject to available space in any given edition.

SHOULD MATHEMATICIANS COOPERATE WITH GCHQ?

Dr Richard Pinch, Strategic Advisor for Mathematics Research at GCHQ, who has been a member of the LMS for over 35 years, writes the following in response to Dr Leinster’s opinion piece Should Mathematicians Cooperate With GCHQ?:

Dr Leinster’s opinion piece makes a range of allegations of unethical and unlawful conduct against GCHQ. The allegations are so widely drawn that it is impossible for GCHQ to recognise them as a description of its activities.

GCHQ, along with the other intelligence agencies of the UK, is subject to some of the most rigorous legislative and oversight arrangements in the world. These ensure that all the work of the agencies is carried out in accordance with a strict legal and policy framework so that their activities are at all times legal, authorised, necessary and proportionate.

GCHQ does not comment on intelligence matters, but would draw your readers’ attention to the comments of the Foreign Secretary in the House of Commons on 10 June 2013, quoting the Interception Commissioner: “it is my belief … that GCHQ staff conduct themselves with the highest levels of integrity and legal compliance”, and to Director GCHQ’s evidence to the Intelligence and Security Committee of Parliament on 07 November 2013: “My people are motivated by saving the lives of British forces on the battlefield, they are motivated by fighting terrorists / serious criminals, by meeting that foreign intelligence mission as well. If they were asked to snoop, I would not have the workforce. They would leave the building.”

LONDON MATHEMATICAL SOCIETY

POPULAR LECTURES 2014

Institute of Education, London – Wednesday 9 July
University of Birmingham – Wednesday 24 September

Professor Kevin Buzzard
Imperial College London

What’s in a number?

Much of our work and our leisure interests are now stored in digital format – i.e., as numbers. This has weird consequences: for example some numbers are now copyrighted, and other numbers are illegal.

Professor Buzzard will explain some of these stories, and also what happens if one tries to digitise mathematics itself.

Dr Julia Gog
University of Cambridge

Epidemics and viruses: the mathematics of disease

Dr Gog will look at how mathematics has been applied to help understand and control infectious diseases, from the scale of a single virus particle through to a global influenza pandemic, and considers some mathematical challenges for the future.
OBITUARY

JERZY HERSZBERG

Dr Jerzy Herszberg, who was elected a member of the London Mathematical Society on 20 December 1951, died on 5 February 2014, aged 84. Lilian Button writes: Jerzy Herszberg was born in Poznan and lived there until 1939 when all Jews were sent to the Łódź ghetto. From there they went to a concentration camp where he was separated from his mother and sister, never to see them again. Released by the Americans, he came to England in 1947 with no English or school mathematics, and he achieved a PhD by 1954. He was one of a group of geometers led by Professor Seimple and Professor Bernard Scott at King’s College, London. For a number of years Jerzy went to meetings of the Geometry seminar held alternately at King’s and Sussex University.

I knew him as a colleague at Exeter where he was a lecturer (1955-1961). He then went on to Birkbeck College, London, primarily to teach evening classes to older students who had missed the conventional start to a degree. His universal friendliness was returned by the many neighbours who cared for him at the end.

You might think that the subject of combinatorics started in the 17th and 18th centuries, with (for example) Fermat and Pascal’s work on games of chance, Euler’s solution to the Königsberg bridges problem and his celebrated formula for polyhedra being early highlights. But in fact its history stretches much further than this, with combinatorial topics there, but of course there are many topics that are omitted (or nearly so). The editors mention combinatorial optimisation, combinatorial identities and recreational combinatorics explicitly; but there is little on applications of combinatorics to other areas of mathematics (nothing on root systems, to take just one example), or to computer science, biology or physics.

I think the book brilliantly conveys the grand sweep of combinatorics within 350-or-so pages of text. If you are interested in discrete mathematics, I would urge you to put the book on your beach or Christmas reading list: it is a perfect book to dip into, and you will be sure to discover something you didn’t know. I feel that I have gained a much better appreciation of the history of the areas of combinatorics it covers: there is nothing at all like it that I have seen.

Simon R. Blackburn Royal Holloway, University of London

REVIEWS

COMBINATORICS: ANCIENT AND MODERN

You might think that the subject of combinatorics started in the 17th and 18th centuries, with sections on Indian, Chinese, Islamic and Jewish combinatorics, followed by a pair of essays on Renaissance mathematics and an essay on the long history of the arithmetical triangle. The second part is organised by mathematical topic, with essays on graph theory, partitions, designs, Latin squares, enumeration and finite set theory. In addition, the book begins with an essay by Donald Knuth on the history of the generation and listing of combinatorial patterns and ends with a personal perspective by Peter Cameron on the nature of combinatorics now, and the role of combinatorics in mathematics and society.

As the editors say in their introduction, there will inevitably be topics that are missed out in a book of a reasonable length. All the core combinatorial topics are there, but of course there are many topics that are omitted (or nearly so). The editors mention combinatorial optimisation, combinatorial identities and recreational combinatorics explicitly; but there is little on applications of combinatorics to other areas of mathematics (nothing on root systems, to take just one example), or to computer science, biology or physics.

I think the book brilliantly conveys the grand sweep of combinatorics within 350-or-so pages of text. If you are interested in discrete mathematics, I would urge you to put the book on your beach or Christmas reading list: it is a perfect book to dip into, and you will be sure to discover something you didn’t know. I feel that I have gained a much better appreciation of the history of the areas of combinatorics it covers: there is nothing at all like it that I have seen.

Simon R. Blackburn Royal Holloway, University of London

UNDILUTED HOCUS-POCUS: The Autobiography of Martin Gardner

Martin Gardner, who died in 2010, is very well-known in mathematical circles as the author of the ‘Mathematical Games’ column of Scientific American for more than 25 years from 1957 to 1986. But readers who expect to find some of the many gems which appeared in that column repeated in this book will be sorely disappointed. They appear in the 15 volumes of The New Martin Gardner Mathematical Library published by Cambridge University Press. To paraphrase a well-known television advert, this book does exactly what it says on the cover; it is Martin’s life-story.

The book consists of 21 chapters with a foreword by Persi Diaconis and an afterword by James Randi. For a mathematician the most interesting chapter is Chapter 15, entitled Scientific American. The previous 14 chapters give almost no hint at all of what is to come mathematically. They take us from Martin’s earliest memories and his life in Tulsa, Oklahoma, to his time at the University of Chicago, and then as a journalist and in the navy. Martin hated high school, describing it as ‘like four years in prison’, and only briefly mentions a geometry teacher, Pauline Baker, who didn’t recognise that tic-tac-toe had anything to do with mathematics.

Chapters 5 to 9 on his time at the University of Chicago, and then in New York. He had become interested in topology and had also contributed a series of articles on mathematical magic to Scripta Mathematica. He was introduced by a friend to the hexahexaflexagon and wrote an article on flexagons which appeared in the December 1956 issue of Scientific American. This lead to him writing the famous flexagon column and as it says in the book, ‘the rest is history’. Martin describes this as ‘the second luckiest event in my life’, the first of course being meeting his wife, Charlotte. In order to write the column, Martin bought all the books he could find on recreational mathematics including W.W. Rouse Ball’s classic Mathematical Recreations and Essays. By writing the column, Martin came to meet many
described more as reminiscences. We do not formally meet Martin’s parents and family until Chapter 11 and his wife Charlotte until Chapter 18. But it is a well-written autobiography, obviously a labour of love, easy to read and gives insight into the man who entertained so well and did so much to popularise mathematics for many years.

Terry S. Griggs
The Open University

BEATING THE ODDS: THE LIFE AND TIMES OF E.A. MILNE by Meg Weston,

The title of this remarkable and extremely informative biography, by one of his daughters, reflects the struggles and difficulties encountered by the mathematician, astrophysicist, and former president of the LMS. Despite being tragically cut short of heart failure at the early age of 55, his life was full of great achievements and distinctions and great public service, lived through one of the most revolutionary periods in the history of science. Born to humble origins and aspiring parents and by dint of a successful career, he is probably best remembered for nowadays: cosmology. No conventional thinker, Milne formulated a controversial and radically different viewpoint from both Einstein’s initial 1917 static model and Friedmann and Lemaitre’s expanding universe picture, some form of the latter being almost universally adopted after the work of Hubble and others establishing the existence of galaxies outside our Milky Way whose redshifts are proportional to their distance from us. Despite opposition at that time, and since, to Milne’s theory of Kinematic Relativity many of his novel ideas remain relevant. In particular, the use of (what came to be called) radar measurements of distance and the idea that physics requires two different time-scales, atomic and astronomical, are influential today because they are closely connected with the causal, conformal and metric structure of space-time and the associated question of whether dimensionless combinations of ‘constants of nature’ are truly constant in time.

Roger Penrose, the third Rouse Ball Professor, has written an admiring introduction to the book which points this out. Another of his important insights was that the expanding universe was already implicit in Newtonian gravity.

Milne’s later life was clouded in tragedy. In 1938 his first wife, suffering from severe post-natal depression after the birth of their third child, committed suicide. In 1939 he was back working on ballistics, under very trying personal circumstances and an enormous workload. On returning to Oxford all should have been looking up but sadly his second wife committed suicide in 1945. Milne’s health began to deteriorate. Nevertheless, sustained by his Christian faith, he remained active and at times cheerful. His sudden death in Dublin prevented him from delivering a series of lectures summing up his life’s work; these were published posthumously as Modern Cosmology and the Christian Idea of God.

Nowadays Milne’s name is known to many cosmologists only from the Milne solution of Einstein’s equations, an asymptotic solution of the Friedmann equation for universes which become emptier and emptier of matter and dark energy. In truth it is just flat Minkowski spacetime in curvilinear coordinates. That may have persuaded some that there is little of interest in Milne’s work. The present truly impressive book should dispel any such illusion.

It is not just the story of the man by a dutiful daughter, but a true work of scholarship, aided by the countless experts she has consulted. It describes in non-technical but accurate language Milne’s scientific work, its background, the controversies he was caught up in, academic politics, accounts of his numerous meetings and correspondence, both scientific and social, with a staggering number of now legendary contemporaries, together with some telling commentary on the society of his time.

Meg Weston Smith is to be thanked for informing us with such panache of the struggles and triumphs of her remarkable father.

Gary Gibbons
University of Cambridge

Editor’s note: Hill’s brigades were a group of mathematicians led by A.V. Hill working on first world war gunnery.
### 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 Society’s website (www.lms.ac.uk/content/calendar). Please send updates and corrections to calendar@lms.ac.uk.

#### MAY 2014

- 2 Whittaker Colloquium, Edinburgh (435)
- 7 LMS–WIMCS Analysis Day, Aberystwyth (436)
- 9 Geometry Day V, King’s College London (434)
- 14–15 Two linked one-day Colloquia in Combinatorics, Queen Mary, University of London and LSE (436)
- 15–17 Norrie Everitt Memorial Meeting, Cardiff (432)
- 19–21 Wales Mathematics Colloquium, Gregynog Hall, Powys (434)
- 21 LMS–Gresham College Joint Meeting, London (436)
- 22–23 Magnetohydrodynamics, Exeter (436)
- 23–24 Groups in Galway 2014, National University of Ireland, Galway (436)
- 23–27 European Women in Mathematics 6th Summer School, Institute Mittag-Leffler, Sweden (436)
- 23–27 Random Interacting Systems School and Workshop, Bath (436)
- 23–28 Centralized and Distributed Multi-agent Optimization: Models and Algorithms, CIME-EMS Summer School, Cetraro (436)
- 24–27 Postgraduate Group Theory Conference, Birmingham (346)
- 30–2 Jul Filtering High Dimensional Complex Systems Meeting, Warwick (436)
- 30–3 Jul Young Researchers in Mathematics Conference, Warwick (436)
- 30–4 Jul Groups, Numbers, and Dynamics INI Workshop, Cambridge (436)
- 30–5 Jul Building Bridges, LMS–CMI Research School, Bristol (434)

#### JUNE 2014

- 2–3 Mathematics of String Theory (MOST) Workshop, King’s College London (436)
- 5 Combinatorics in Oxford, Oxford (436)
- 5 Belfast Harmonic Analysis Day, Queen’s University Belfast (435)
- 5 Rings of Differential and Integral Operators Meeting, Plymouth (436)
- 12–18 Curves and Surfaces Conference, Paris (436)
- 13 Mathematical Modelling of Biological and Cultural Evolution, City University London (436)
- 16 Midlands Regional Meeting, Loughborough (436)
- 16–20 Interactions between Dynamical Systems and PDEs, EMS Summer School, Barcelona (436)
- 16 Scattering Theory and Wave Equations Workshop, Loughborough (435)
- 23–24 BioDynamics Workshop, Exeter (436)
- 23–27 Geometry Day (434)
- 23–29 Workshop, King’s College London (436)
- 23 Mathematics of String Theory (MOST) Workshop, Queen Mary, University of London (436)
- 23 Combinatorics in Oxford, Oxford (436)
- 23–25 Mathematics of String Theory (MOST) Workshop, University of Manchester (436)
- 28–1 Aug Mathematical Relativity, ESI-EMS-IAMP Summer School, Vienna (436)
- 28–4 Aug International Mathematics Competition for University Students, Blagoevgrad, Bulgaria (435)

#### JULY 2014

- 30–4 Jul Filtering High Dimensional Complex Systems Meeting, Warwick (436)
- 30–3 Jul Young Researchers in Mathematics Conference, Warwick (436)
- 30–4 Jul Groups, Numbers, and Dynamics INI Workshop, Cambridge (436)
- 30–5 Jul Building Bridges, LMS–CMI Research School, Bristol (434)

#### AUGUST 2014

- 30–2 Jul Filtering High Dimensional Complex Systems Meeting, Warwick (436)
- 30–3 Jul Young Researchers in Mathematics Conference, Warwick (436)
- 30–4 Jul Groups, Numbers, and Dynamics INI Workshop, Cambridge (436)
- 30–5 Jul Building Bridges, LMS–CMI Research School, Bristol (434)

#### SEPTEMBER 2014

- 28–2 Oct Advances in Probability Clay Research Workshop, Oxford (436)
- 29–3 Oct Analytic Number Theory Clay Research Workshop, Oxford (436)
- 29–3 Oct Functional Transcendence around Ax–Schanuel Clay Research Workshop, Oxford (436)
- 29–3 Oct Symplectic Topology Clay Research Workshop, Oxford (436)

#### OCTOBER 2014

- 1 Clay Research Conference, Oxford (436)

#### NOVEMBER 2014

- 14 LMS AGM, London

#### MARCH 2015

- 30–2 Apr Joint Meeting of the BMC and BAMC, Cambridge (436)

#### JULY 2015

- 13–17 Conference on Stochastic Processes and their Applications, Oxford (436)
Introduction by Gwyneth Stallard
Chair of the LMS Women in Mathematics Committee

Reidun Twarock (University of York)
Mary Cartwright Lecturer
Viruses and Geometry: Hidden Symmetries in Virology

Anne Taormina (Durham University)
Moonshines

Exhibition of polyhedral designs

An exhibition of polyhedral designs by Briony Thomas (School of Design, University of Leeds)
inspired by Reidun Twarock’s viral tiling theory