

LONDON MATHEMATICAL SOCIETY

NEWSLETTER

No. 422 February 2013

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NEWSLETTER ONLINE:

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newsletter.lms.ac.uk

150 YEAR IMPACT ASSESSMENT

By now most readers of the LMS *Newsletter* will be all too well acquainted with the word 'impact' in the Research Excellence Framework (REF) sense (not to be confused with the same word used more inclusively by EPSRC). It means impact not just outside the subject, but outside academia. All of us have a strong belief that mathematics does have broad impact in this sense, but not always in a way that qualifies for the REF. Three of the obstacles are the 20 year timescale required by the REF, the requirement to give a precise route that the impact has followed, and the requirement that the impact is very specific. Mathematics often has a long term, pervasive and holographic impact.

The LMS will be 150 years old in 2015, and this seems the ideal opportunity to make our case for the extensive impact of mathematics on our own terms. To help our celebrations, I would like to collect examples of mathematics done in the last 150 years that has had impact outside academia. If the mathematics was published or facilitated by the LMS, so much the better, but this is not required.

Please contact me if you have good examples: to start with, it would be enough to send just a

couple of paragraphs describing the mathematics and its impact. Anyone lacking inspiration need only consider the first three LMS presidents: De Morgan, Sylvester and Cayley. Their work is surely a rich source of impact. The idea is to work up each of the best examples into a longer account of several pages, giving some real detail, both of the mathematics and of the impact. The more precise you can be, and the more clearly you can make the connection, the better. Please let me know if you are willing to work on the fuller account or suggest someone else who would be both willing and appropriate.

The idea is to publish these 150 year Impact Case Studies at the start of 2015, so please send examples as soon as possible and in any case by Easter 2013. The form of the publication will depend on the response, but I imagine a series of articles under the headings *150 Year Impact Assessment of Mathematics* and *150 Year Impact Assessment of the London Mathematical Society*. I hope it will be possible to use an appropriate summary to clearly show policy makers (or even HEFCE) the overwhelming long-term impact of mathematics. In any case there will be a summary account in the LMS *Newsletter* in 2015.

John Greenlees
(J.Greenlees@sheffield.ac.uk)

NEW YEAR HONOURS LIST 2013

Frank Kelly, Professor of the Mathematics of Systems, Statistical Laboratory, University of Cambridge, Master of Christ's College Cambridge and Chair of the Council for Mathematical Sciences, has been appointed Commander of the Order of the British Empire (CBE) in the 2013 New Year Honours for services to mathematical sciences.

This is a very prestigious honour and the London Mathematical Society (LMS) would like to extend its warmest congratulations to Professor Kelly. Graeme Segal, LMS President, said, 'Frank Kelly has led the Council for the Mathematical Sciences (CMS) to a position of great authority and influence, and has contributed enormously to making the national support of mathematics secure. His recognition is very amply deserved'.

Also recognised in the New Year Honours list: **Officer of the Order of the British Empire (OBE)** Professor David John Hand, Senior Research Investigator, Imperial College London, for services to Research and Innovation.

Member of the Order of the British Empire (MBE) Terence James Heard, Co-Founder, UK Mathematics Trust, for services to the teaching of mathematics.

Member of the Order of the British Empire (MBE) Jenny Stephanie Ramsden, for services to Further Education and to Mathematics Education through the UK Mathematics Trust.

MATHEMATICS TEACHING SCHOLARSHIPS

The IMA is delighted to be able to announce that it will be delivering the Mathematics Teaching Scholarships recently announced by the DFE (see www.ima.org.uk/viewItem.cfm?cit_id=384408 for the press release).

Working in collaboration with the LMS, RSS and with other experts in mathematics, statistics and teaching practice we aim to recommend the awarding of 150 scholarships of £20,000 to candidates that we believe will become excellent teachers and leaders of mathematics teaching in the future. It is expected that applicants will have at least First or 2.1 degrees and

appropriate mathematical knowledge and skills demonstrated by at least an A level (A* to B Grade) or equivalent mathematical experience. Further information can be found on www.ima.org.uk/careers/teacher_scholarships.cfm.

We are looking for appropriately skilled individuals to assist with the selection process for which payment will be available. Briefly the selection process will comprise submission of a short video, attendance at a regional assessment centre made up of a discussion group and written mathematical tests and finally a formal interview.

If you would like further information or wish to participate in the assessment process please contact us on Scholarships@ima.org.uk.

Dagmar Waller

Project Manager, Mathematics Teacher Scholarships, The Institute of Mathematics

MATHEMATICS POLICY ROUND-UP

January 2013

RESEARCH

Autumn Statement 2012

In his Autumn Statement, George Osborne announced a further £600 million for capital investment in scientific research infrastructure. More information is available at www.hm-treasury.gov.uk/as2012_index.htm.

EPSRC/DST Interaction Meeting in Applied Mathematical Sciences Research Challenges

The purpose of this Interaction Meeting was to explore possible links and commonalities between the UK and India in Applied Mathematics research. The meeting aimed to identify research gaps, which could yield opportunities for collaborations and cross-disciplinary research. The focus was on providing networking opportunities for researchers from both the UK and India, providing initial introductions which may lead to ongoing collaboration. There were also opportunities for discussion on specific areas of common inter-

est, including Industrial Mathematics and the interface of Mathematics with Energy.

The meeting was co-hosted by the UK's Engineering and Physical Sciences Research Council (EPSRC) and India's Department for Science and Technology (DST). It was organised in partnership with RCUK India and with the assistance of the International Centre for Mathematical Sciences (ICMS). A report of the meeting is now available at <http://tinyurl.com/atp85sa>.

HIGHER EDUCATION

LMS Benchmarking Survey due to launch in February

The London Mathematic Society will be launching a new report on *Good Practice in University Mathematics Departments* in February. The report highlights examples of good working practice found in UK university mathematics department with an emphasis on improving the recruitment, retention and progression of women in mathematics. More information will be available in due course.

The LMS decided to develop a Good Practice Scheme for departments of mathematics to help them to take practical actions to improve the participation of women and to share examples of good practice with other departments. The Scheme also offers support in applying for an Athena Swan award for those departments seeking an award to recognise their work in this area.

The Scheme has been developed in consultation with Athena Swan and other bodies such as the Institute of Physics who have a well established Juno scheme to improve the participation of women in university physics departments. It has also been developed in consultation with HoDoMS to ensure that it offers help with measures that can realistically be taken by a head of department.

By engaging with the Good Practice Scheme, a department will move towards a working culture in which all staff and students, both male and female, can achieve their full potential. This has to be good for recruitment and retention of talented

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staff. More information about the Scheme is available at www.lms.ac.uk/women/good-practice-scheme.

Becoming a Juno Practitioner

The Institute of Physics has published this guide to good practice. The aim of Juno is to recognise and reward departments that can demonstrate they have taken action to address the under-representation of women in university physics and to encourage better practice for both women and men. The publication is available at www.iop.org/publications/iop/2012/file_59110.pdf. The LMS Good Practice Scheme is designed to support the corresponding principles in mathematics.

SCHOOLS AND COLLEGES

LMS collaborates in new teacher training scholarship scheme

Education Secretary Michael Gove has announced a new partnership with the Institute of Mathematics and its Applications (IMA) in collaboration with the London Mathematical Society (LMS) and the Royal Statistical Society (RSS) (see article on page 2-3). The LMS will work together with the IMA and RSS to offer around 150 scholarships, worth £20,000 each, to graduates with a 2:1 or a first-class degree wanting to train as a mathematics teacher.

Alice Rogers, LMS Education Secretary, said: 'This scholarship scheme will increase the number of good mathematicians who become good mathematics teachers, and will ensure they feel welcomed as members of the broader mathematics community. Bringing into schools more teachers with a deeper understanding of the subject will give many more children an intellectually stimulating encounter with mathematics, and an understanding of it which they in turn will use and share'.

Nigel Steele, IMA Honorary Secretary for education, said: 'Mathematics, through its applications, already contributes massively to the UK economy. Research also shows that those who do well at mathematics at school are likely to earn significantly more than

their peers. The scholarship scheme designed by the IMA, on behalf of its collaborating bodies, will attract highly-qualified graduates and career-changers who might not otherwise have considered teaching as a career. These scholars will help strengthen the mathematics teaching force in its capacity to inspire those who will determine the future'.

Valerie Isham, RSS President, said: 'Getting the best people into teaching mathematics and statistics in schools is a crucial step in helping children to develop the analytical and numerical skills they need for further academic study and exciting careers in a whole range of areas. Inspirational teachers can provide motivation, insight and enthusiasm. Statistical literacy is an essential life skill: the need to make decisions based on numerical data confronts us all in every aspect of our professional and personal lives'. More information about the scholarships is available at <http://tinyurl.com/axgbpyk> and www.ima.org.uk/careers/teacher_scholarships.cfm.

KS4 Consultation

The London Mathematical Society has responded to the Department for Education's consultation on the Key Stage 4 Qualifications reform. The full response is available at <http://tinyurl.com/afz728n>.

Correspondence on English Baccalaureate Certificates

Ofqual has written to the Department for Education to express its concerns over the timetable for change proposed by the Department. The correspondence is available at <http://tinyurl.com/c83el3w>.

GCSE and A-level survey

Ofqual has commissioned a survey of staff responsible for offering places at higher education institutions in England. The study is to help understand perceptions of A-levels, GCSEs and other qualifications, and their regulation. This piece of research will provide key information about how well Ofqual is meeting its public confidence objective, as well as identifying areas around GCSE and A-

level qualifications where there are potential problems. More information is available at <http://tinyurl.com/ampk7n8>.

Proposals for post-16 mathematics

The Advisory Committee on Mathematics Education (ACME) has published two papers recently on proposals for post-16 mathematics. The first, *Post-16 Mathematics: increasing provision and participation*, provides an overview to the fundamental changes to the structure and type of mathematics qualifications beyond GCSE. The second paper, *Planning for success*, describes the steps that will need to be taken to make this work. We are setting a demanding challenge. Many agencies and organisations will need to work together, alongside government, so that the complex ecosystem that drives students, schools and colleges ensures 21st century students are equipped with the mathematical capabilities that they are going to need in their personal and working lives. ACME looks forward to seeing these changes taking place. The papers are available at <http://tinyurl.com/awgp9my> and <http://tinyurl.com/aqrwdt>.

Raising the bar: developing able young mathematicians

The Advisory Committee on Mathematics Education (ACME) has published a paper, entitled *Raising the bar: developing able young mathematicians*. The paper identified that the process of accelerating promising pupils through the curriculum was occurring at both primary and secondary school. At primary, schools are assessed on the results of Level 6 tests, which examine pupils on their ability to solve mathematics utilising concepts from the secondary curriculum. At a secondary, league tables encourage schools to enter their pupils to take their mathematics GCSE early ('early entry'), which can lead to shaky foundations and hinder progression to A-level. The full paper is available at <http://tinyurl.com/b897gdj>.

Dr John Johnston
Mathematics Promotion Unit

DANIEL R. HUGHES

Professor Dan Hughes, who was elected a member of the London Mathematical Society on 15 November 1962, died 19 October 2012, aged 85.

Fred Piper writes: Although he was educated in the USA and began his academic career there, Dan spent most of his working life at the University of London before enjoying the major part of his retirement in his beloved Italy.

Most of Dan's mathematics concentrated on Finite Geometries, Block Designs and Finite Groups and he made a number of significant research contributions to each of the areas. However, despite his eminence as a researcher, he will probably be best remembered for his inspirational lectures, his infectious enthusiasm for mathematics (and life in general) and his willingness to spend time with anyone who was interested, no matter whether they were established senior researchers or fresh faced PhD students. I have lost count of the number of well established mathematics professors who admit to being influenced by Dan and who unashamedly admit that they owe some of their success to his influence. I am proud to be one of them.

I was introduced to Dan in my first week as a PhD student (when he was a visiting professor at Queen Mary College). Seven years later we became colleagues at Westfield College where we worked together for more than fifteen years. They were exciting and happy times.

There is no doubt that the mathematics community has lost an exceptionally able and productive research colleague. However, in addition to losing a respected colleague, many of us have lost an inspirational friend who was, to coin a cliché 'larger than life'. There was much more to Dan than being a mathematician. He enjoyed life 'to the full' with mathematics, his family, ladies, story-telling, good food, good wine and Italy among his many passions. He will be sorely missed.

VIACHESLAV BELAVKIN

Professor Viacheslav Belavkin, who was elected a member of the London Mathematical Society on 21 June 1996, died on 27 November 2012, aged 66.

John Gough, Madalin Guta and Robin Hudson write: Viacheslav (Slava) Pavlovich Belavkin was born in Lviv in 1946, and graduated from Moscow State University in 1970. Slava's thesis was entitled *Optimal Estimation and Measurements of Quantum Systems* and his supervisor was the eminent probabilist Ruslan Stratonovich who developed the symmetric alternative to Ito's stochastic calculus along with the theory of nonlinear filtering. Indeed, Slava's later work would be to extend the rich seam of mathematical research of Stratonovich from the classical to the quantum domain. This program led to the development of quantum Markov models and quantum stochastic processes, dynamical non-demolition principles for quantum continuous measurement, and ultimately to the birth of quantum filtering theory. In 1996 he shared the Main State Prize of the Russian Federation with Stratonovich. In the 1980s Slava visited the Dublin Institute of Advanced Studies, and the Volterra Centre in Rome before taking up an appointment at Nottingham University in 1992. He was later promoted to a Chair in Mathematical Physics in 1996. This was a very fertile period for Quantum Probability and Slava would play a major role in nurturing and shaping the field.

In the last decade there has been a resurgence of interest in Slava's work, as experimental capabilities reached the stage where the models he proposed can be implemented in practice. His visionary ideas are now the basis of quantum feedback control, and the paradigms he introduced are gaining mainstream acceptance, particularly with the emergence of Quantum Control Engineering as a mathematical discipline.

Slava was still very much active and doubtlessly would have made many more important contributions, had he not suc-

cumbed to serious illness in the last few years. Slava is survived by his wife Nadia and son Roman.

MARGARET JACKSON

Dr Margaret Jackson, who was elected a member of the London Mathematical Society on 14 June 1951, died on 23 October 2012, aged 88.

George Hall, David Martin and Neil Jackson write: Margaret's 30 years of work at the University of Nottingham was characterised by her long term care of students both within the mathematics department and as a tutor in Florence Boot Hall. She was a well-liked, energetic member of staff with valued expertise in her field.

Born in Burnley on 31 December 1923 Margaret attended Burnley High School for Girls, studying further mathematics at Burnley Boys Grammar School as higher level mathematics was not available at the girls school. She progressed on to Bedford College completing her MSc in Mathematics after the war. Following her MSc Margaret began work as a lecturer at the University of Nottingham and completed her PhD in Mathematics there in 1952 with thesis *Generalized Bilateral Hypergeometric Series* building on her MSc work with supervisor W.N. Bailey. Margaret's MSc work had been published in JLMS 24(1949) on *On some Formulae in Partition Theory, and Bilateral Basic Hypergeometric Series and A Generalization of the Theorems of Watson and Whipple on the Sum of the Series $3F_2$* . Her passion for mathematics was communicated to her students with breathless enthusiasm. On retirement as senior lecturer she moved to her beloved Arnside in Cumbria. She never married, but was survived by her older brother Arthur and three nieces and a nephew, 11 great nieces and nephews and three great great nephews. A memorial service will be held at Arnside Methodist Church on Friday 22 February at 2.30 pm to which friends and colleagues will be most welcome.

COLIN MACLACHLAN

Dr Colin MacLachlan, who was elected a member of the London Mathematical Society on 18 November 1965 died on 26 November 2012, aged 73.

Bill Harvey writes After a BSc and Teaching Diploma from Queen's College Dundee, Colin moved to Birmingham to study for a PhD with A.M. Macbeath, graduating in 1966. Two years in Canada at Carleton University were followed by a return to Britain and a full career of teaching and research at the University of Aberdeen. He retired in 2004 but continued with research, editing and outreach activities. Colin was a fine mathematician with an international reputation in discrete groups and Riemann surfaces, specialising in arithmetic aspects of hyperbolic geometry. He published over sixty research papers and collaborated with more than twenty co-authors. His book *The Arithmetic of Hyperbolic 3-Manifolds* written with Alan Reid (his former student) is the standard text in the subject and incorporates many of their own results into this vibrant area of contemporary geometry.

Colin was President of the Edinburgh Mathematical Society (1997-1999) and also served two separate terms as Convener of the Editorial Board for the Proceedings of the EMS. He was a frequent contributor to the Aberdeen series of Mathematics Masterclasses, enthusing many secondary pupils with the mathematical aspects of cryptography and of knots. He also served for several years as chair of the North of Scotland section of the Mathematical Challenge competition for secondary schools.

Colin was a keen cricketer, gardener and hill-walker; he completed the Scottish Munros in 1998. He also undertook several voluntary activities in the local community. He is survived by his widow, Dorothy, three children and six grandchildren. He will be greatly missed by all who knew him.

Colin and I were fellow students of Mur-

ray Macbeath in Birmingham and worked together from the outset in learning the essential background from geometry, complex analysis and group theory necessary for understanding our supervisor's innovative work on Fuchsian groups and moduli of Riemann surfaces. We succeeded, largely thanks to his calm assured way of coping with the ups and downs of learning how to do research in the same way that he addressed every issue. His honesty, good humour and careful approach ensured that we both got to the core ideas of our thesis problems quickly: it was fun. He made a significant impression in the area of Riemann surface theory, and proved a signal result about the topology of moduli spaces (they are simply connected for all values of the genus). We remained lifelong friends. I leave the last word to the poet Norman McCaig:

*Such warmth in my mind
where you talk and laugh
and drink drams
and walk amongst mountains*

INSTITUT MITTAG-LEFFLER SUMMER SCHOOL

Call for Proposals

The European Women in Mathematics (EWM) and the European Mathematical Society Women in Mathematics Committee are pleased to invite proposals for a one week summer school at the Institut Mittag-Leffler in Stockholm in summer 2014. A special feature of the summer school is that there will be a much larger than usual involvement by women. It is expected that most or all of the organising committee, at least half the participants, and if possible the lecturers, should be female.

Further details can be found on the EWM website <http://ewm-association.org> under 'News'. In case of difficulty please contact C.M.Series@warwick.ac.uk. The deadline for proposals is **15 March 2013**.

LONDON MATHEMATICAL SOCIETY

MARY CARTWRIGHT LECTURE AND SOCIETY MEETING

Friday 1 March 2013

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



Margaret Wright
Mary Cartwright Lecturer 2013

Programme:

- 3.30 Opening of the meeting
Jeff Lagarias (University of Michigan)
From ABC to XYZ
- 4.30 Tea
- 5.00 Mary Cartwright Lecture
Margaret Wright
(Courant Institute, New York University)
A Mathematical Journey

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

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

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

INTERNATIONAL MATHEMATICAL CULTURES INVESTIGATION

Do you have experience of the education system in another country as a member of staff? If so, I need your help.

I am carrying out a project funded by the Higher Education Academy to investigate the different international cultures surrounding mathematics education. The purpose of the project is to identify the key differences and then to produce a guide, in the form of a short booklet and a supporting website, that will provide a summary of the mathematical cultures of a range of the main international suppliers (of staff and of students) to mathematics in UK HE.

If you have experience of mathemat-

ics education in other countries then you have valuable information to contribute to this project. I would be grateful if you would complete the online questionnaire available at <http://tinyurl.com/b3zmgol>.

This questionnaire contains 12 substantive questions and should take no more than 10 to 15 minutes to complete. All the information that you provide will be treated in confidence. If you would like further information about the study, please contact Dr Aiping Xu (telephone 024 7688 7590 or email aiping.xu@coventry.ac.uk).

Dr Aiping Xu
Mathematics Support Centre
Coventry University

LMS INVITED LECTURES 2013

Professor Fedor Bogolomov
(Courant Institute, NYU)

Birational Geometry and Galois Groups

10-14 June 2013, University of Edinburgh

The lectures will discuss the relation between the structure of the Galois group of algebraic closure of a field of rational functions and the structure of the field itself. More precisely, they will cover how to extract effectively birational invariants (i.e. geometric invariants of projective models of the field from the Galois group).

There will also be supplementary lectures by:

- G. Brown (Loughborough) *Fano 4-fold hypersurfaces*
I. Cheltsov (Edinburgh) *Finite subgroups of Cremona group*
T. Logvinenko (Warwick) *Derived categories and birationality*

University and local Guesthouse accommodation will be available.

Limited financial support is available with preference given to UK research students. Please contact the organisers for further details (i.cheltsov@ed.ac.uk, J.Martinez-Garcia@sms.ed.ac.uk). Deadline for funding: **1 May 2013**.

For further details on the 2013 Invited Lectures visit: www.maths.ed.ac.uk/cheltsov/fedya/

LONDON MATHEMATICAL SOCIETY MIDLANDS REGIONAL MEETING

Tuesday 11 June 2013

University of Leicester

Programme:

Opening of the Meeting

Speakers:

Franz Pedit (Massachusetts)

Frances Kirwan (Oxford)

Peter Topping (Warwick)

Wine Reception and Dinner

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

For further details and to register and to reserve a place at the dinner, please contact the organisers: (k.leschke@le.ac.uk). The cost of the dinner is to be confirmed, and will include drinks.

The meeting forms part of a workshop on *Advances in Surface Theory* from 12 to 14 June. For further details, please contact the organiser (k.leschke@le.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.

QUANTUM FIELDS, GRAVITY AND INFORMATION



Postgraduate researchers, from inside and outside the UK, are invited to exchange ideas on the mathematical aspects of relativistic quantum physics. The conference will take place at the University of Nottingham from 3 to 5 April 2013. A special focus will be given to relativistic quantum information, a relatively young field which combines techniques from quantum field theory, quantum gravity, quantum information and quantum optics. The invited speakers reflect the diversity of areas covered:

- Bob Coecke (Oxford)
- Ivette Fuentes (Nottingham)
- Etera Livine (Lyon)
- Tim Ralph (Brisbane)

Funding is available to cover accommodation and travel for up to 30 participants. The organisers expect to give all of them the opportunity to contribute either with a talk or a poster. For further information visit qfgi2013.weebly.com or send an email to qfgi2013@nottingham.ac.uk.

The meeting is supported by an LMS Postgraduate Research Conference Scheme 8 grant, the ΔP research network, the Edinburgh Mathematical Society and the Institute of Mathematics & its Applications.

VISIT OF SUSAN HERMILLER

Professor Susan Hermiller (University of Nebraska-Lincoln) will be visiting the Mathematics Departments at Warwick, Newcastle and St Andrews during March and April 2013. Her research area is geometric group theory. Professor Hermiller will give seminars at:

- Warwick on 7 March; contact Derek Holt (D.F.Holt@warwick.ac.uk)
- Newcastle on 18 April; contact Sarah Rees (sarah.rees@newcastle.ac.uk)
- St Andrews on 23 April; contact Collin Bleak (collin@mcs.st-and.ac.uk)

The visit is supported by an LMS Scheme 2 grant.

YOUNG TOPOLOGY MEETING



The *Young Topology Meeting UK* will take place at Imperial College London from 25 to 26 April 2013. It is an opportunity for PhD students and early career mathematicians to present and discuss their work with other young topologists. Every participant is encouraged to present their own research. Dr Andrew Lobb (Durham University) will give a plenary talk.

For further information visit the website www3.imperial.ac.uk/geometry/seminars/ytm or contact the organiser Senja Barthel (s.barthel11@imperial.ac.uk). The meeting is supported by an LMS Postgraduate Research Conference Scheme 8 grant.

VISIT OF VLADIMIR TROITSKY

Professor Vladimir Troitsky (University of Alberta, Canada) will visit the UK in May 2013. His expertise is in functional analysis and operator theory, notably invariant subspaces for bounded operators on Banach spaces and Banach lattices, operator ideals, semigroups of positive operators, and tensor products of Banach lattices.

During his visit, Professor Troitsky will deliver a lecture entitled *Invariant ideals of positive operators on Banach lattices* in each of the following places:

- Queen's University Belfast, Friday 10 May; contact Ariel Blanco (a.blanco@qub.ac.uk)
- Lancaster University, Wednesday 15 May; contact Niels Laustsen (n.laustsen@lancaster.ac.uk)
- University of Oxford, Tuesday 21 May; contact Charles Batty (charles.batty@sjc.ox.ac.uk)

For further information contact Niels Laustsen (n.laustsen@lancaster.ac.uk). The visit is supported by an LMS Scheme 2 grant.

CECIL KING TRAVEL SCHOLARSHIP



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

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

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

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

LARGE DEVIATIONS AND ASYMPTOTIC METHODS IN FINANCE

A workshop on *Large Deviations and Asymptotic Methods in Finance* will take place at Imperial College London from 9 to 11 April 2013.

Asymptotic methods span a large number of results on the estimation of rare-event probabilities and the computation of the asymptotic behaviour of partial differential equations. Over the last decade the theory has been successfully applied to the area of quantitative finance, ranging from Monte Carlo estimators and importance sampling to implied volatility asymptotics, to large portfolio losses, to long-term investment strategies and to asymptotic arbitrage. The aim of this workshop is to gather experts in the area of large deviations and asymptotic methods and highlight its diverse impacts on mathematical finance. The invited speakers are:

- Stefano De Marco (Ecole Polytechnique)
- Jean-Dominique Deuschel (TU Berlin)

- Peter K. Friz (TU Berlin)
- Josselin Garnier (University Paris 7)
- Stefan Gerhold (Vienna Univ of Technology)
- Sam Howison (University of Oxford)
- Michel Mandjes (University of Amsterdam)
- Andrea Pascucci (University of Bologna)
- Huyen Pham (University Paris 7)
- Mathieu Rosenbaum (University Paris 6)
- Walter Schachermayer (University of Vienna)
- Richard Sowers (Univ of Illinois at Chicago)
- Konstantinos Spiliopoulos (Boston University)
- Peter Tankov (University Paris 7)
- Sean Violante (TU Berlin)

Further information is available on the website www2.imperial.ac.uk/~ajacque/WorkshopLDP/index.html.

HEIDELBERG LAUREATE FORUM

The Klaus Tschira Stiftung invites students, PhD candidates and postdocs in the fields of mathematics and computer science from all over the world to the first Heidelberg Laureate Fo-

rum. Candidates who recently completed their PhD and show a strong interest in science are also encouraged to apply, even if they are now working in a non-scientific environment.

The Forum offers the extraordinary opportunity to meet some of the pre-eminent scientists in mathematics and computer science to a select group of young researchers. During the week-long event, they will be able to get to know recipients of the most prestigious prizes for mathematics (Fields Medal and Abel Prize) and computer science (Turing Award). The first Heidelberg Laureate Forum will take place from 22 to 27 September 2013 and will be held annually thereafter. Lectures and workshops offer plenty of opportunity for scientific exchange, while a rich variety of social events encourages the young researchers to engage in casual conversations with their scientific role models.

For further information and application forms visit the website at www.heidelberg-laureate-forum.org. The application deadline is **15 February 2013**. Successful applicants will be notified by 15 April 2013. Travel support will be provided for a limited number of young researchers. The Klaus Tschira Stiftung (www.klaus-tschira-stiftung.de) supports the natural sciences, mathematics and computer science.

BRITISH COMBINATORIAL CONFERENCE

The 24th British Combinatorial Conference (BCC) will be held at Royal Holloway, University of London from 30 June (arrival date) to 5 July 2013. The BCC is a biannual conference featuring contributed and invited talks by distinguished international speakers in all areas of Combinatorics and its applications. Cambridge University Press will publish survey articles based on the invited talks:

- Jacob Fox (MIT) *Graph removal lemmas*
- Massimo Giulietti (Perugia) *The geometry of covering codes: small complete caps and saturating sets in Galois spaces*
- Tor Hellesteth (Bergen) *Bent functions and their connection to combinatorics*
- Jan van den Heuvel (LSE) *The complexity of change*
- Jozef Širáň (Open University) *How symmetric*

can maps on surfaces be?

- Einar Steingrímsson (Strathclyde) *Some open problems on permutation patterns*
- Kristina Vušković (Leeds) *The world of hereditary graph classes viewed through Truemper configurations*
- Geoff Whittle (Victoria University of Wellington) *Structure in minor-closed classes of matroids*
- Doron Zeilberger (Rutgers) *Automatic counting of tilings of skinny plane regions*

To register and for more information please visit the website bcc2013.ma.rhul.ac.uk or email bcc2013@rhul.ac.uk.

EXPLICIT METHODS FOR MODULAR FORMS

A workshop on the subject of *Explicit Methods for Modular Forms* will take place at the University of Warwick from 18 to 22 March 2013. This workshop is part of the 2012-2013 EPSRC Warwick Number Theory Symposium and is organised by John Cremona, David Loeffler, and Samir Siksek (Warwick), with William Stein (Washington) and Gabor Wiese (Luxembourg). Invited speakers include:

- Mike Bennett (British Columbia)
- Nicolas Billerey (Clermont-Ferrand)
- Gebhard Böckle (Heidelberg)
- Peter Bruin (Zurich)
- Sander Dahmen (Utrecht)
- Lassina Dembele (Warwick)
- Luis Dieulefait (Barcelona)
- Neil Dummigan (Sheffield)
- Paul Gunnells (Amherst) (tbc)
- Ian Kiming (Copenhagen)
- Ariel Pacetti (Buenos Aires)
- Cris Poor (Fordham)
- Haluk Sengun (Warwick)
- Nils Skoruppa (Siegen)
- Fredrik Strömberg (Darmstadt)
- John Voight (Vermont)

For further information visit the website www2.warwick.ac.uk/fac/sci/maths/research/events/2012-2013/numbertheory which gives further information, including how to register.

This meeting is supported by EPSRC and the Warwick Mathematics Research Centre.

BRITISH MATHEMATICAL COLLOQUIUM 2013 WORKSHOPS

Further to the announcement, in the November *Newsletter*, of the British Mathematical Colloquium at the University of Sheffield in March 2013, the speakers at the workshops will include those listed below:

- **Category Theory:** Martin Hyland (Cambridge), Nicola Gambino (Palermo), Neil Ghani (Strathclyde), François Métayer (Paris 7), Tamara von Glehn (Cambridge), Jon Woolf (Liverpool)
- **K-Theory and Analysis:** Jacek Brodzki (Southampton), John Hunton (Leicester), Roger Plymen (Manchester), Christian Voigt (Glasgow)
- **History of Mathematics** (Wednesday 27 March): Stephen Huggett (Plymouth), Jeremy Gray (Open), Peter Rowlett (Nottingham Trent)
- **Mathematical Higher Education** (in conjunction with HEA, Tuesday 26 March): Lara Alcock (Loughborough), Tim Lowe (Open), Lars Olsen (St Andrews), David Pritchard (Strathclyde)
- **Noncommutative Algebra and Representation Theory:** Kobi Kremnitzer (Oxford), André Leroy (Artois, Lens), Abdenacer Makhlouf (Haute Alsace), Alex Martsinkovsky (Northeastern), Jonathan Nelson (Cambridge), Agata Smoktunowicz (Edinburgh)
- **Number Theory:** Barinder Banwait (Warwick), Vladimir Dokchitser (Cambridge), Ivan Fesenko (Nottingham), Christian Johansson (Imperial), Sanju Velani (York)
- **Probability:** Maren Eckhoff (Bath), Ben Hambly (Oxford), Antal Járαι (Bath), Matt Roberts (Warwick), Amanda Turner (Lancaster), Andrew Wade (Durham), Peter Windridge (Queen Mary)
- **Topology:** Julian Gibbons (Imperial), Magdalena Kedzior (Sheffield), Martin Palmer (Oxford), Birgit Richter (Hamburg), Constanze Roitzheim (Kent), Markus Szymik (Copenhagen), Raymond Vozzo (Glasgow)

The BMC workshops are supported by the London Mathematical Society and the Mathematics and Statistics Research Centre of the University of Sheffield. Unless stated otherwise, the workshops take place on the afternoons of Tuesday 26 March and Wednesday 27 March.

BMC information will continue to be updated at www.sheffield.ac.uk/mathsbmc2013. The registration fee is due to increase on 15 February 2013.

School of Mathematics Distinguished Lecture Series

In collaboration with the Heilbronn Institute
our Distinguished Lecture Series for 2013 will be given by

Prof Hee Oh, Brown University

Monday March 25th, 4-5pm Colloquium
'Apollonian circle packings, fractal geometry and dynamics'
[Chemistry Lecture Theatre 2]
Wine reception, 5-7pm

Tuesday March 26th, 3-4pm
'Equidistribution, counting and primes for discrete groups I'
[Howard House]

Wednesday March 27th, 11-12am
'Equidistribution, counting and primes for discrete groups II'
[Howard House]

Wednesday March 27th, 3-4pm
'Equidistribution, counting and primes for discrete groups III'
[Howard House]

www.maths.bris.ac.uk/events/seminars/series





Isaac Newton Institute
for Mathematical Sciences

DYNAMICS OF SUSPENSIONS, GELS, CELLS AND TISSUES

24 – 28 June 2013

in association with the Newton Institute programme
Mathematical Modelling and Analysis of Complex Fluids
and Active Media in Evolving Domains
(1 May – 23 August 2013)

Organisers: Karsten Kruse (Saarbrücken), Len Pismen (Technion) and Alexander Leshansky (Technion)

The workshop will cover recent experimental and theoretical developments in the field of active soft matter, including both biological and biomimetic applications, and ranging from self-propelled particles to active elastomers. The talks and discussions will elucidate unique features of complex dynamic phenomena in these media. This workshop will bring together experts in all the above fields, to compare and contrast the various them, to discuss topical and future problems and methods of their solution, and to explore possible applications.

Some sessions will be held jointly with the concurrent workshop on *Liquid crystal defects and their geometry, active and solid liquid crystals, and related systems*.

The accommodation costs and registration fee may be waived for some junior applicants who are chosen to present a talk.

Further information and application forms are available from the website at www.newton.ac.uk/programmes/CFM/cfmw01.shtml

Closing date of the receipt of applications is **28 February 2013**.



Modern nonlinear PDE methods in fluid dynamics

LMS-EPSRC Short Course

University of Reading

8-12 July 2013

Organisers: Beatrice Pelloni & Eugen Varvaruca

Course outline

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

The four main lecture course topics are:

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

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

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

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

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

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

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

Fees

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

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

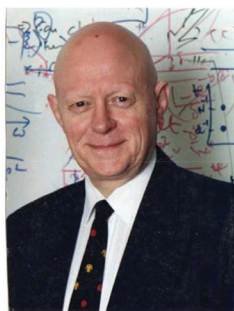
All others (overseas students and postdocs, those working in industry) will be charged a registration fee of £250 plus the full subsistence costs (£280) **£530** in total.

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

LMS-EPSRC Short Courses aim to provide training for postgraduate students in core areas of mathematics. Part of their success is the opportunity for students to meet other students working in related areas as well as the chance to meet a number of leading experts in the topic.



The 2013 David Crighton Lectures and Medal Presentation



Thursday 14 March 2013
The Royal Society, Carlton House Terrace,
London, SW1Y 5AG

*The lectures will start at 6.30 pm, with Registration from 6.00 pm.
A reception will be held after the lectures*

Dr Peter Neumann OBE
(University of Oxford)

***Tout ce gâchis: why edit the mathematical
manuscripts of Évariste Galois?***

Professor Arie Iserles
(University of Cambridge)
The future of life, mathematics and everything

To register contact Duncan Turton at the LMS
(email duncan.turton@lms.ac.uk) or De Morgan House, 57-58 Russell
Square London WC1B 4HS by 1 March 2013

Attendance is free of charge and is on a first come, first served basis.

LONDON MATHEMATICAL SOCIETY NORTHERN REGIONAL MEETING

Monday 18 March 2013

Herschel Building, Newcastle University

Programme:

- 2.00 pm** Opening of the meeting
Volodymyr Mazorchuk (Uppsala)
- 3.15 pm** **Ivan Smith** (Cambridge)
- 4.30 pm** Tea/Coffee
- 5.15 pm** **Bernhard Keller** (Paris 7)
- 6.30 pm** Reception and Buffet at The Penthouse

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

To register, please visit www.mas.ncl.ac.uk/triangulations/index.php?p=6.
Registration closes on **31 January 2013**.

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

There are funds available to contribute in part to the expenses of members of the Society or research students to attend the meeting and workshop. Requests for support, including an estimate of expenses, may be addressed to the organisers (peter.jorgensen@ncl.ac.uk).

LMS PROSPECTS IN MATHEMATICS

Report

The *LMS Prospects in Mathematics* conference, now in its sixth year, aims to give final-year undergraduate and MSc students an overview of the many and varied opportunities for mathematical research that exist at universities in the UK. The most recent meeting was held at the University of Manchester from 18 to 19 December 2012 and was attended by just under sixty students.

Following a brief overview of PhD funding opportunities and general advice for PhD applicants, Colm Caulfield (Cambridge) started the research talks with his presentation *Shaken or stirred? Inherent nonlinearity in fluid dynamics* in which he described many strands of current research in fluid mechanics, stressing the potential for (and the benefits of) close interactions between theoretical, computational and experimental studies. He was followed by Jane Hutton (Warwick) whose talk *Modelling life and death: good life or bad drugs?* described some of the challenges in medical (and other) applications of statistics, frequently drawing on her experience as an expert witness in court cases. A gap in the programme, created by the last minute cancellation of one of the speakers, was filled by an inspired Manchester-based double act: Mark Kambites' impromptu, blackboard-based introduction to Tropical Mathematics was followed by Francoise Tisseur's illustration of the (unexpected) benefits of interactions between numerical analysts and pure mathematicians: she demonstrated how results from Tropical Mathematics allowed significant improvements to a numerical algorithm for quadratic eigenvalues problems.

Coffee and cakes were followed by presentations from the three mathemati-

cal Doctoral Training Centres at Warwick (MASDOC), Lancaster (STOR-i) and Cambridge (CCA). Elizabeth Fisher (from the LMS) then gave a brief overview of the LMS's activities before Mark Holland (Exeter) resumed the research talks with an introduction to Dynamical Systems, *Recurrence and chaos in dynamical systems*, assisted by various hands-on experiments which provided beautiful illustrations of chaotic behaviour. Carmen Molina-Paris (Leeds) finished off the first day with an overview of *Mathematical immunology at the molecular, cellular and population scales*.

The dinner on the Atrium Bridge of the Alan Turing Building provided ample opportunity for mingling between academics and the potential PhD students – the (mathematical) discussions were still in full flow when we had to vacate the building at 9 pm.

Darren Crowdy (Imperial) started proceedings on Wednesday with his hugely entertaining talk *Lotus leaves, ketchup, and boundary value problems, fixed and free, in applied mathematics* for which he should probably have been awarded a prize, given the level of audience participation he achieved. Anand Pillay (Leeds) delivered an impressive overview of *Logic, model theory, applications* after which speakers and participants were treated to coffee and yet more cakes. Nick Bingham (Imperial) convinced the audience that there is *Probability everywhere* before Chris Hughes (York) delivered an enthusiastic lecture on *Applications of random matrix theory*. Lunch was followed by Rob Scheichl's (Bath) talk *Multiscale problems: Numerical analysis and scientific computing* which illustrated the wide range of practical applications in which multiscale problems arise, and demonstrated how novel numerical methods allow the efficient solution of the resulting stochastic PDEs. Sarah Whitehouse (Sheffield) concluded the meeting with a beautiful talk on *Algebraic structures in topology*.

Overall, the meeting was hugely enjoyable for everybody. The speakers had been instructed to represent their respective UK research communities (rather than to 'pitch' just for themselves). This aim was achieved admirably and gave the students an impression of how vibrant mathematical research in the UK is. It was interesting to observe much unexpected overlap between the talks, showing common trends in superficially distinct areas of mathematics, thus counteracting the impression that mathematics is divided rigorously into the traditional sub-disciplines of Pure, Applied and Statistics/Probability. Specifically, Nick Bingham's claim that *Probability [is] everywhere* was amply demonstrated throughout the meeting. The students clearly enjoyed the opportunity to interact with leading mathematicians and their enthusiasm bodes well for the future of the discipline.

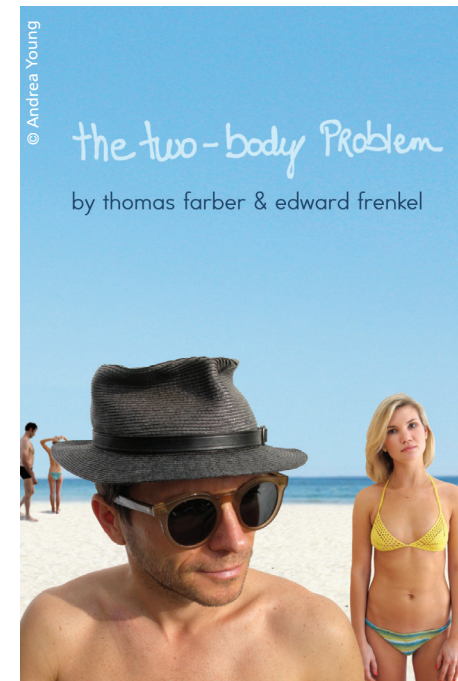
Photographs from the conference can be found on the back cover of this Newsletter.

Matthias Heil
University of Manchester

REVIEW

The Two Body Problem a screenplay by Farber and Frenkel

Edward Frenkel is a remarkable mathematician whose achievements in various areas of contemporary mathematics such as the Langland's correspondence place him at the forefront of *avant garde* pure mathematics. He is also a mathematician that has sought unusual outlets to display his interests. His introductory calculus lectures on You Tube have more than 100,000 views, which tells you something of his performance ability. More remarkable was the controversial film short *Rites of Love and Math*, which was a mathematics-centred homage to the Japanese Nobel prize-winning author Mishima's *Rites of Love and Death*. *Rites* won prizes at



Cannes and has been shown at film festivals throughout the world. In *Rites*, Frenkel wrote the script and played the male lead himself. In this film, the mathematician is at the centre of the story, rather than mathematics itself. In *The Two Body Problem*, this is even more the case.

The story is one of love, sex and friendship. Again it is the mathematician (along with his author friend) that is at the nexus of the story whilst the mathematics is a sideline providing the occasional trope. Symmetry, set theory and an entertaining and novel application of catastrophe theory (that I doubt René Thom had in mind but who knows) are topics discussed in passing. The two main protagonists are a mathematician and a writer who meet on the French Riviera and spend time discussing women, mathematics, love and writing. Given that Thomas Farber (Frenkel's co-author) is a professor of literature in Berkeley, one has a suspicion that this

work is a somewhat autobiographical. The style of writing and dialogue are reminiscent of David Mamet; it's sharp, funny and yet there is a depth to the conversations that point to the characters' fate and history.

The humanising of mathematics is laudable but really it is the humanising of the mathematician that is the real success. In cinema, mathematicians and scientists are typically portrayed as either James Bond baddies who have a developed a terrible virus/laser/nuclear weapon, or as hopeless (always male) nerds who have no chance of attracting the opposite sex. The mathematician in Frenkel's screen play is sexy, bold and confident. He makes no apology for who he is and communicates a love of the subject, and his excitement by it.

Recently Frenkel has had other literary successes. It is clear that his talents extend in moving beyond the traditional mathematical realm of journals and seminars. How much of the mathematics remains is a question. But does it matter? The humanising of the mathematician is a goal in itself, and in that Farber and Frenkel succeed admirably.

David Berman
Queen Mary, University of London

The book was originally published by Andrea Young Arts in 2010, with a revised edition published in 2012 (www.amazon.com/Two-Body-Problem-Thomas-Farber/dp/0982012527).

CONFERENCE FACILITIES

De Morgan House offers 40% discount on room hire to all Mathematical charities and 20% to all not-for-profit organisations. Support the LMS by booking the next London event at De Morgan House.

Call us now on 020 7927 0800 or email roombookings@demorganhouse.co.uk to check availability, receive a quote or arrange a viewing of the venue.

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.

FEBRUARY 2013

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

MARCH 2013

- 1 LMS Mary Cartwright Lecture, London (422)
- 14 David Crighton Lectures, Royal Society, London (422)
- 18 LMS Northern Regional Meeting, Newcastle University (422)
- 18-22 Triangulations and Mutations Workshop, Newcastle (421)
- 18-22 Explicit Methods for Modular Forms Workshop, Warwick (422)
- 18-22 Analytical and Computational Paths from Molecular Foundations to Continuum Descriptions Workshop, INI Cambridge (419)
- 19 *Modelling the World*, Gresham College
- 19 Large Evolving Networks Workshop, Bristol (421)
- 20 Geometry and Topology Day, University College London (421)
- 20-22 Young Functional Analysts' Workshop, Sheffield (421)
- 22-23 NBFAS, Sheffield (421)
- 25-26 Data Analysis for Cyber Security Workshop, Bristol (421)
- 25-27 Quantitative Modelling in the Management of Health and Social Care 7th IMA Conference, Central London (416)
- 25-27 Distinguished Lecture Series, Bristol (422)

- 25-28 BMC, Sheffield (420)
- 26 LMS Meeting at BMC, Sheffield
- 26 Contemporary Challenges for the Delivery of Undergraduate Mathematics Courses, Sheffield (421)

APRIL 2013

- 2-5 Operads and Deformation Theory INI Conference, Cambridge (418)
- 2-5 Char p Methods in Algebraic Geometry, Imperial College, London
- 3-5 Quantum Fields, Gravity and Information, Nottingham (422)
- 8-9 Mathematics in Finance IMA Conference, Heriot-Watt University (416)
- 8-12 Advances in Number Theory and Dynamical Systems Conference, Bristol (421)
- 9-11 Large Deviations and Asymptotic Methods in Finance Workshop, Imperial College London (422)
- 9-12 BAMC, Leeds (421)
- 10 Finite Simple Groups, Algebraic Groups and their Impact, Birkbeck, London
- 12-13 Integrable Models, Conformal Field Theory and Related Topics, Hertfordshire
- 15-17 Conformal Geometry and Function Theory in Mapping, Imaging and Sensing, Imperial College London
- 15-19 Geometric and Topological Graph Theory Workshop, Bristol (421)
- 18-19 Women in Maths Day, Cambridge
- 25 Quantum Algorithms Day, Bristol (421)
- 25-26 Young Topology Meeting, Imperial College, London (422)

MAY 2013

- 1-3 Mathematical Models of Biological Evolution, Leicester
- 10-11 String Math UK, Surrey
- 15 LMS-Gresham Lecture, Peter Cameron, Museum of London (422)

JUNE 2013

- 5 Combinatorics One Day Meeting, Oxford
- 10-14 LMS Invited Lecturers, Fedor Bogolomov, Edinburgh (422)
- 11 LMS Midlands Regional Meeting, Leicester (422)
- 11-14 MAFELAP 2013, Brunel

- 12-14 Advances in Surface Theory Workshop, Leicester (422)
- 17-20 Young Researchers in Mathematics 2013, Edinburgh
- 20-21 High-Dimensional Inference with Applications, Kent
- 24-28 Liquid Crystal Defects and their Geometry INI Workshop, Cambridge (421)
- 24-28 Dynamics of Suspensions, Gels, Cells and Tissues INI Workshop, Cambridge (422)
- 30-5 Jul British Combinatorial Conference, Royal Holloway College, University of London (422)

JULY 2013

- 1-2 Bifurcation Theory, Numerical Linear Algebra and Applications, Bath
- 1-4 Dense Granular Flows 2nd IMA Conference, INI, Cambridge (416)
- 3-13 *Polylogarithms as a Bridge between Number Theory and Particle Physics* LMS-EPSRC Durham Symposium
- 5 LMS Meeting, London
- 8-12 Modern Nonlinear PDE Methods in Fluid Dynamics, LMS-EPSRC Short Course, Reading (422)
- 15-19 Polynomial Optimisation Summer School and Workshop, INI, Cambridge (420)
- 15-25 Graph Theory and Interactions LMS-EPSRC Durham Symposium
- 29-2 Aug Computational Group Theory, LMS-EPSRC Short Course, St Andrews (422)

AUGUST 2013

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

SEPTEMBER 2013

- 2 Heilbronn Day, Groups and Their Representations, Manchester
- 3-6 Brauer's Problems in Representation Theory – 50 years on, Manchester
- 9-13 Spectral Geometry, Chaos and Dynamics, Loughborough
- 11-13 Mathematics of Surfaces 14th IMA Conference, University of Birmingham (416)
- 22-27 Heidelberg Laureate Forum, Heidelberg (422)

LMS PROSPECTS IN MATHEMATICS MEETING

held at the University of Manchester from 18 to 19 December 2012
(report on page 20)



Mark Holland (Exeter)



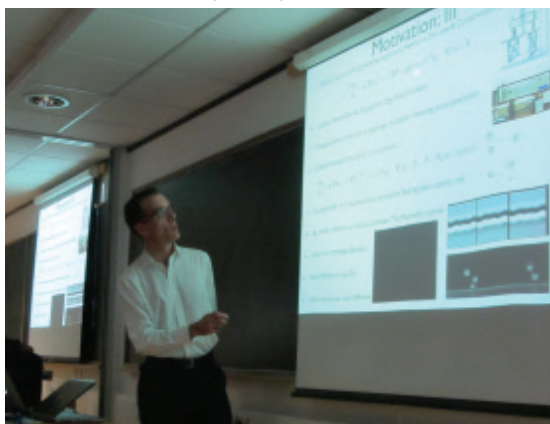
Rob Scheichl (Bath)



Jane Hutton (Warwick)



Darren Crowdy (Imperial)



Colm Caulfield (Cambridge)



Carmen Monila-Paris (Leeds)