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### No. 391 April 2010

# Society Meetings and Events

### 2010

Wednesday 14 April Northern Regional Meeting, Newcastle [page 3]

### Thursday 15 – Friday 16 April

Women in Mathematics Two-Day Meeting Cambridge [page 17]

### Monday 21 June

SW & South Wales Regional Meeting Cardiff

### Friday 2 July

Hardy Lecture London [page 19]

Monday 6 September Midlands Regional Meeting, Nottingham

### Friday 19 November Annual General Meeting and Naylor Lecture, London

# 22 January 2010

This was the first meeting of the year, and the President's first task was to welcome incoming Council members, with three membersat-large and five of the eight Officers newly elected. (One interesting statistic regarding the current Council's composition is that Imperial College is particularly well-represented with three members-at-large.) A small but important item in the first meeting of a new year is the completion of declaration of interests forms by Council members. In relation to publications, for example, the issues here are non-trivial. Given that many Council members are significantly involved in other publishing ventures, e.g. as managing editors or trustees of other, potentially rival, publications, there is a requirement to guard against conflicts of interests - and also perceived conflicts of interest with the commercial publications business of the LMS.

Under President's business, Angus reported on his LMS duties since the previous meeting. A timeconsuming strand of these duties is wining, snacking, and dining on our behalf, and the President cited, *inter alia*, a recent reception at the House of Commons marking the end of the 3-year *More Maths Grads* project and a dinner at the Royal Society on its 350th anniversary. He also reported briefly on a meeting that he and Bernard Silvermann (at the time President of the Royal Statistical Society but recently appointed Chief Scientific Advisor to the Home Office) had had with Dame Julia Higgins, Chair of the Advisory Committee on Mathematics Education (ACME).

The Treasurer reported on investment and membership matters, in particular on a recent meeting between the Society's Investment Committee and representatives of Morgan Stanley (the Society's investment managers). The news here, if news is the right word, is that the performance of the Society's investments has been disappointing over the last five years. By this I mean not just that the Society's aspiration for real annual growth of 4% has not been achieved - not surprising given the recent turmoil in the markets - but also the growth achieved (2.26%) is below a benchmark figure of 2.81% based on a balance of indices reflecting the LMS strategic allocation of assets. There was considerable discussion, given the importance of the Society's investments in supporting its activities, regarding the way forward with a view to improving this performance.

Having considered, under publication business, recommendations regarding renewed contracts from the Publications Committee, we turned to various items under

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Society Business, including a report from the Nominating Committee regarding their activities over the last year. The way Nominating Committee is set up, according to the By-Laws, makes it a body which is independent of Council, but there were significant views expressed at the meeting regarding how it ought to operate. Specifically, one view put forward (the "five minutes to midnight" position) was that it should have merely a stop-gap role, nominating candidates at the last minute and only if no candidates have been proposed by the membership. At the other end of the spectrum is the view that how Nominating Committee currently operates is the correct model (currently Nominating Committee proactively proposes a full slate, and more, of candidates, taking care in its deliberations to propose a mix that it feels is representative, as to areas of mathematics, gender, geographical location, etc.) The majority view was in support of this latter model; indeed we were supportive of the recommendation of Nominating Committee that its list of candidates, once finalised, should appear on

the LMS website (and this well before midnight on the closing date for nominations).

Under staff matters, we heard reports on the progress on the important matter of appointment of a new Executive Secretary for the Society, and agreed delegation of this activity (subject to some consultation of Council by email) to a smaller appointments group, and a (fairly generous, room-for-manoeuvre) upper bound for the salary to be awarded.

Finally, we turned, fairly briefly, as time ran short, to matters arising from the Retreat. Regarding progress on increasing membership, we had agreed earlier in the day to appoint Garth Dales as chair of the *ad hoc* Membership Group which will do some hard thinking in this direction. To move forward in another important area, we agreed to set up another working group immediately to oversee the commissioning of a new website and related management databases, recognising that the likely needed investment here would be considerable.

Simon Chandler-Wilde

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## LMS Newsletter

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# LONDON MATHEMATICAL SOCIETY NORTHERN REGIONAL MEETING

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## Wednesday 14 April 2010

### Clement Stephenson Lecture Theatre, Agriculture Building, University of Newcastle

| 2.30 | Opening of the meeting                |
|------|---------------------------------------|
|      | Michah Sageev (Technion)              |
|      | CAT(0) cube complexes in group theory |
| 3.45 | Tea/Coffee                            |

**4.15 Benson Farb** (Chicago) Representation theory and homological stability

6.00 Dinner at a local restaurant

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, to register or to reserve a place at the dinner, email the organisers (lmsn@ncl.ac.uk). The cost of the dinner will be approximately £30 including drinks.

The meeting will be preceded by a workshop on *Geometry, Analysis, and Logic of Groups*, from 12 to 14 April. For further details visit www.mas.ncl.ac.uk/lmsnorth or contact the organisers.

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. 3

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# ANNUAL ELECTIONS TO LMS COUNCIL

The normal way in which nominations to Council are made is via the Nominating Committee, but there is also provision for all members of the Society to make nominations directly. Anyone who wishes to suggest someone for a position as an Officer of the Society or as a Member of Council is invited to inform Professor Caroline Series, who is the current chair of the Nominating Committee (C.M.Series@warwick.ac.uk) or one of the other members of the Committee (A. Etheridge, C.A. Hobbs, P. Kropholler, M. Liebeck, M. Reid, A. Truman, A.J Wilkie) by **1 June 2010**.

Direct nominations should be sent to the Executive Secretary's office (leanne.marshall@ lms.ac.uk) to arrive before noon on 1 September 2010. Such nominations must bear the signatures of the Nominator and three Seconders and of the Nominee. A letter with the relevant names and signatures is sufficient, alternatively a form on which to make such nominations is available from the office on request.

Nominating Committee seeks to maintain a balance in gender, subject area and geographical location when drawing up its list of prospective nominees, and LMS members should bear in mind that it is to the benefit of Council if a wide spread of subject areas are represented.

The slate proposed by Nominating Committee, together with other direct nominations received up to that time, will be posted on the LMS website in early August for members to see before deciding whether they wish to make any further direct nominations. Further direct nominations will be posted as they are received.

## LMS CONFERENCE FACILITIES

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

# LMS GRANT SCHEMES

Readers are reminded of the Society's Schemes to provide grants for the following activities:

- Conferences and postgraduate research conferences held in the UK (Schemes 1 and 8)
- Visitors to the UK (Scheme 2)
- Collaborative small grants (Scheme 4)
- International short visits with the main focus on Africa (Scheme 5)

The next deadline for receipt of applications for the above grant schemes is **15 May 2010** and these 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.

For full details of all Schemes please see the Society's website (www.lms.ac.uk/grants). Queries regarding applications can be addressed to the Programme Secretary, Stephen Huggett (tel: 01752 586869, email: s.huggett@ plymouth.ac.uk) or the Grants Administrator, Sylvia Daly (tel: 020 7291 9971, email: sylvia. daly@lms.ac.uk, Wednesday–Friday) who will be pleased to discuss proposals informally with potential applicants and give advice on the submission of an application.

Information on other grant schemes operated by the Society, for education, the mathematics-computer science interface, and childcare, is also available at www.lms. ac.uk/grants.

## **NEW SCIENTIFIC DIRECTOR**

The Board of the International Centre for Mathematical Sciences (ICMS) is pleased to announce that Professor Keith Ball of University College London has been appointed to the post of Scientific Director of ICMS. Later this year he will succeed John Toland who was appointed in 2002.

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# INTERNATIONAL CONGRESS OF MATHEMATICIANS 2010

### LMS travel grants: deadline extended

The London Mathematical Society would be pleased to see a strong UK contingent at the ICM in Hyderabad from 19 to 27 August 2010 (www.icm2010.org.in). The Society has set aside funds to be used for making grants to support the attendance of UKbased mathematicians at the ICM. You do not need to be an LMS member to apply.

Those who are not eligible for a Royal Society International Travel grant, or were unsuccessful in obtaining one when applying for their February deadline, can apply to the London Mathematical Society for a grant to contribute to the costs of attending the ICM. Please contact Isabelle Robinson for an application form (isabelle.robinson@Ims.ac.uk, tel. 020 7291 9977) or download one from the LMS website (www.Ims.ac.uk). Applications should be submitted by **30 April 2010** and applicants will be informed of the outcome by mid-May.

# EPSRC-LMS DURHAM RESEARCH SYMPOSIA

The LMS Research Meetings Committee is responsible for the planning of the EPSRC–LMS Durham Symposia, which have been running successfully each July and August since 1974, with 90 symposia to date, in a wide range of mathematical disciplines. In 2010 there will be two Durham Symposia, both supported by EPSRC.

- 5–15 July Numerical analysis of multiscale problems (organisers: I. Graham, T. Hou, R. Scheichl)
- 18–25 July Non-Perturbative techniques in field theory (organisers: P. Mansfield, D. Tong, W. Zakrzewski, M. Zamaklar)

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More information on the first symposium may be obtained from Ivan Graham (i.g.graham@bath.ac.uk), and on the second one from Wojtek Zakrzewski (w.j.zakrzewski@ durham.ac.uk).

The symposia in 2009 and 2008 were as follows:

2009

- Combinatorial and geometric structures in representation theory (J. Brundan, J. Chuang, I. Gordon, B. Leclerc)
- New directions in the model theory of fields (D. Macpherson, A. Pillay, M. Prest, A. Wilkie) 2008
- Mathematical aspects of graphical models (P. Dawid, S. Lauritzen),
- Computational linear algebra for partial differential equations (A. Ramage, D. Silvester, A. Wathen)

The Durham website (www.maths.dur.ac.uk/ events/Meetings/LMS) contains information on all previous and forthcoming symposia including, in many cases, a list of participants, abstracts of talks, a symposium photograph (the earliest surviving photograph is from 1976), lecture notes and, for symposia since 2004, videos of the talks.

The LMS Research Meetings Committee (RMC) welcomes ideas for symposia for 2012 and later, from potential organisers and others, who should contact the Chairman of the Committee. Professor N.S. Manton (manton@lms.ac.uk). Outline proposals for 2012 should be submitted by 1 September 2010. The EPSRC has agreed to fund the Durham Symposium programme until at least 2013, and the RMC is able to approve proposals (after an external refereeing process) and commit substantial funding, including full economic costs of the organisers, the subsistence costs of all invited participants, and some travel support. Considerable assistance is available in preparing the scientific and financial case for the proposals, and in the running of the symposium itself. More information concerning the Durham Symposia is available on the LMS website (www.lms.ac.uk/activities/rmc).

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| am                                                                         | UNIVERSITY OF CAMBRIDGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| nd                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| ki@                                                                        | FACULTY OF MATHEMATICS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| as                                                                         | ADAMS PRIZE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                            | Discrete Mathematics or Number Theory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| ng,                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| lds<br>(ie)                                                                | The University of Cambridge has announced the subject for one if its oldest and most prestigious prizes. The Adams Prize is named after the mathematician John Couch Adams and was endowed by members of St Johns' College. It commemorates Adams's discovery of the planet Neptune, through calculation of the discrepancies in the orbit of Uranus.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| er,<br>uk/ 🗥                                                               | The Chairman of the Adjudicators for the Adams Prize invites applications for the 2010-11 Prize which will be awarded this year for achievements in research on Discrete Mathematics or Number Theory.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| anv<br>on<br>ud-<br>ab-<br>the<br>lec-<br>eos<br>A(C)<br>lat-<br>µho<br>oo | The prize is open to any person who, on 31 <sup>st</sup> October 2010, will hold an appointment in the UK, either in a university or in some other institution; and who is under 40 (in exceptional circumstances the Adjudicators may relax this age limit). The value of the prize is expected to be approximately £13,000, of which one third is awarded to the prize-winner on announcement of the prize, one third is provided to the prize-winner's institution (for research expenses of the prize-winner) and one third is awarded to the prize-winner on acceptance for publication in an internationally recognised journal of a substantial (normally at least 25 printed pages) original article, of which the prize-winner is an author, surveying a significant part of the winner's field. |
| ee,<br>uk).<br>ted<br>l to<br>ntil                                         | Applications (email and two hard copies), comprising a CV, a list of publications, the body of work (published or unpublished) to be considered, and a brief non-technical summary of the most significant new results of this work (designed for mathematicians not working in the subject area) should be sent to:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| ove<br>ess)<br>full<br>iist-                                               | The Secretary of the Adams Prize Adjudicators,<br>Faculty Office, Centre for Mathematical Sciences,<br>Wilberforce Road, Cambridge, CB3 0WA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| me<br>ila-<br>ase                                                          | (email: faculty-office@maths.cam.ac.uk)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| ing<br>MS                                                                  | The deadline for receipt of applications is 31 October 2010.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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### NEWSLETTER

## MATHEMATICS POLICY ROUND UP

### **Council for the Mathematical Sciences**

The CMS held its annual meeting with the Engineering and Physical Sciences Research Council in February. At this meeting, EPSRC confirmed that its mathematical sciences budget would remain unchanged this coming year, with £14 million available for research, £9.34 million for fellowships and £11.4 million for training. The CMS warned that mathematics was in danger and that diverting funds to multi-disciplinary programmes could be damaging. It said masters and doctoral degrees were disappearing and that this, coupled with university funding cuts and the large number of academics due to retire in coming years, meant the strength of UK mathematics was at risk. In response to a question, EPSRC Chief Executive Professor David Delpy confirmed his opinion that investment in mathematics was too small, but added there was no support from TOP or UP to grow the core funding. The CMS met later in February and agreed to work on making the case for mathematical sciences research and also to input into the International Review of Mathematics which the EPRSC will begin overseeing in December 2010. The CMS is in the process of appointing a new chair following the expiry of Sir David Wallace's three-year term.

### Mathematics Promoters New Year Drinks

The Mathematics Promoters network held its annual New Year Drinks party at the end of February this year. Michael Grove, director of the National HE STEM Programme, gave a presentation about the plans and strategy of the project and then received questions from the network members. Particular concerns were voiced about the expectations of employers regarding the skills of the new graduates they look to recruit. A key aim of the project is to work closely with employers to ensure that the workforce has the skills it requires. Maths Prom members were keen to ensure the project is also able to open communication between employers and universities so that they can understand which skills mathematical sciences departments can realistically provide students with and which must be developed by the employers themselves. The evening finished with refreshments, whilst the snow fell and wind blew outside De Morgan House.

### ACME

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The Advisory Committee on Mathematics Education (ACME) has been busy working on mathematics policy issues at school level. It has met Ed Balls, Secretary of State for Children, Schools and Families, to discuss the future of Key Stage 2 assessment in mathematics at the end of primary school. ACME has also been discussing the structure of GCSE mathematics with the DCSF, as there are plans to reduce the number of tiers of entry for candidates from three to two. The committee has submitted a joint response with the Joint Mathematical Council to the consultation launched by recently-formed exams regulator Ofqual on its duties and powers, arguing that the mathematics community is most concerned with transparency, diversity amongst subjects and level of intervention, and efficiency of qualification markets. The annual ACME conference was held on 2 March, and speakers included parliamentary under-secretary of state for schools, Diana Johnson MP, shadow secretary of state for children, schools and families, Michael Gove MP, Professor Marcus du Sautoy, director of the National STEM Programme Professor Sir John Holman and Carol Vorderman, who has been leading a review of mathematics teaching for the Conservative Party and is expected to report shortly. See www.acme-uk.org.

### Teaching of STEM subjects

In February, the House of Commons' Children,

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Schools and Families Select Committee had what can only be described as a 'lively' session hearing evidence from three mathematical witnesses for their enquiry into the Teaching of STEM subjects. Professor Margaret Brown, Professor of Mathematics Education, King's College London, Dr Tony Gardiner, Reader in Mathematics and Mathematics Education, University of Birmingham, and Jane Imrie, Deputy Director, National Centre for Excellence in the Teaching of Mathematics discussed the pressure on teachers to raise exam results, the issues of attracting the best people into teaching and the suitability of the current mathematics curriculum. Members of the committee suggested at several points that some of the failures current in mathematics education were due to the mathematics community having a weak voice. Committee chair Barry Sheerman MP said, "You haven't really been successful in telling politicians and Ministers what you need and what you want." Later the same day, the committee heard evidence from engineering witnesses. As the afternoon progressed, it was clear the tone of the engineers was somewhat different. Mr Sheerman commented, "You seem to be on a different planet from a mathematician. You seem so bubbly... We have received really good evidence from the mathematicians, but they seemed rather down about the possibility of getting more people into maths." To read the complete (uncorrected) evidence see www. publications.parliament.uk/pa/cm200910/ cmselect/cmchilsch/uc340-ii/uc34002.htm.

### MEI appoints new Chief Executive

The trustees of Mathematics in Education and Industry (MEI) have announced the appointment of Charlie Stripp as its next Chief Executive, starting on 1 September 2010. The MEI announcement said, "Charlie is well known for his pioneering work for MEI promoting Further Mathematics during the last 10 years. He was programme leader of the Further Mathematics Network, following on from a pilot project funded by the Gatsby Charitable Foundation, and now runs the Further Mathematics Support Programme. A former teacher, Charlie has experience in almost all aspects of mathematics education: examinations, textbooks, on-line learning, masterclasses, CPD, etc. He is an active member of the Mathematical Association." Outgoing Chief Executive Roger Porkess commented, "I am really pleased about Charlie's appointment. He has the vision to ensure that MEI will continue to be a major source of creativity and innovation for mathematics in this country and the drive to ensure that it actually happens."

### Mathematics degrees seen as useful

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A psychologist at University College London has published a study on attitudes to various degree subjects. Professor Adrian Furnham questioned 500 members of the public to rate the 'usefulness for employability' of 20 degree subjects. The top three were Law, Mathematics and English, whilst the bottom three were Fine Art, Anthropology and Theology. Interesting results were gained by grouping respondents by various factors: older people rated English, German and Mathematics more useful than did younger people, whilst respondents with right-wing political views rated Mathematics higher and Biology, Chemistry, and Zoology lower than did their left-wing peers.

### More Maths Grads in Parliament

Video footage of the reception to celebrate the three-year *More Maths Grads* project is now available online on the YouTube site. The event took place on 27 January 2010 at the House of Commons, hosted by the Rt Hon. Charles Clarke MP. The following clips show the speakers and exhibition at the event:

www.youtube.com/watch?v=zNJVotADtNQ www.youtube.com/watch?v=t3LAtEPazd0 www.youtube.com/watch?v=ncYnZrFdd1A

> Caroline Davis Mathematics Promotion Officer

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### NEWSLETTER

## DAVID EDWARD WILLIAMS

David Edward Williams, who was elected a member of the London Mathematical Society on 21 May 1970, died on 6 December 2009, aged 82.

Gerald Williams writes: David Williams was born in 1926 in Ystrad Mynach, a small mining village in South Wales. He attended Lewis School Pengam and in 1945 won a State Scholarship to study Mathematics at Jesus College Oxford, going on to obtain his BA in 1948.

After a year working for Rolls-Royce analysing the stress in jet engines, he moved to the Royal Aircraft Establishment (RAE) in Farnborough in 1949 where he remained until his retirement in 1986.

The first phase of his work there was in Structures Department performing the mathematical analysis of the effects of flutter, vibration and aerodynamic forces on aircraft. He was amongst the first in Britain to use digital computers for such analysis, programming the RAE's two DEUCE computers 'Gert' and 'Daisy' in the mid-1950s. But he took his real pleasure from mathematics. A widely read mathematician, one of his great strengths was his ability to draw on highly abstract results from pure mathematics and use them to solve practical engineering problems that were important to the establishment at that time.

From 1960 to 1979 he headed the Mathematics Section of the Mathematics Department where he now specialised in Stability and Control Theory. From 1979 until his retirement he was a Principal Scientific Officer in the Space Department carrying out research in the dynamics and control of spacecraft. The sensitive nature of his work allowed him to publish just once in open literature but his publications within the RAE were widely cited, and he was known across the organisation as the man to seek out when faced with challenging mathematics problems. Throughout his retirement he maintained an interest in the subject, keeping abreast of latest developments and publications.

Colleagues from the RAE remember him as an intelligent, highly knowledgeable, yet softly spoken man ever willing to share his enthusiasm and expertise. His generosity and gentle nature won him many friends and he will be missed by all who knew him. He is survived by his wife Helen, two sons, and two granddaughters.

# STOCHASTIC DIFFERENTIAL EQUATIONS

A one-day workshop on Stochastic Differential Equations: Theory, Numerics and Applications will be held at Swansea University on Wednesday 19 May 2010. The main speakers are:

- Sondipon Adhikari (Swansea)
- John Appleby (Dublin)
- Evelyn Buckwar (Edinburgh)
- Neville Ford (Chester)
- Kai Liu (Liverpool)
- Markus Riedle (Swansea)
- Sotirios Sabanis (Edinburgh)
- Jian Wang (Dresden)
- Wei Yang (Warwick)

The workshop will address new trends in the modern theory and applications of SDEs. Particular areas will include numerical solutions of SDEs and SDDEs, and mathematical finance.

The local organizers are: Niels Jacob (N.Jacob@swansea.ac.uk) and Chenggui Yuan (C.Yuan@swansea.ac.uk). For more detailed information contact Dr Chenggui Yuan. The workshop is supported by the London Mathematical Society, Wales Institute of Mathematical and Computational Sciences (WIMCS), and Department of Mathematics of Swansea University. Limited funds are available to support participation of PhD students.

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### NEWSLETTER

# VISIT OF PROFESSOR G. BIONDINI

Professor Gino Biondini (State University of New York at Buffalo, USA) will be visiting UK from 28 April to 8 May. Professor Biondini's research area is integrable systems. He will give seminars at:

- Imperial College, 4 May; contact Darryl Holm (d.holm@imperial.ac.uk)
- Cambridge University, 6 May; contact Thanasis Fokas (T.Fokas@damtp.cam.ac.uk)
- Reading University, 7 May; contact Beatrice Pelloni (b.pelloni@reading.ac.uk)

Professor Biondini will be based at Cambridge during his visit, hosted by Professor Thanasis Fokas. This visit is supported by an LMS Scheme 2 grant.

# VISIT OF PROFESSOR A. ENAYAT

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Professor Ali Enayat (American University, Washington) is visiting the UK in the week of 9 to 14 May 2010. His current interests include non-standard models of arithmetic and weak set theories and the relationships between them. During his visit he will give talks at:

- University of East Anglia, 10 May, 2.30–3.30, School of Arts, Room A 2.86: Set theoretical challenges posed by the model theory of arithmetic, contact M. Dzamonja (m.dzamonja@uea.ac.uk)
- University of Leeds, 12 May, 10.00–11.00, Mall 2, School of Mathematics: Which models of PA arise as the standard model of some model of ZF?, contact A. Pillay (a.pillay@leeds.ac.uk)
- University of Manchester, 13 May, 3.00– 4.00, Frank Adams Seminar Room I, School of Mathematics, Alan Turing Building: *Full* satisfaction classes, revisited, contact J. Paris (jeff.paris@manchester.ac.uk)

For further information contact Jeff Paris (jeff.paris@manchester.ac.uk). This visit is supported by an LMS Scheme 2 grant.

# **VISIT OF DR J. EAST**

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Dr James East (University of Sydney) will visit the UK during April and May. Dr East's research area is Algebraic Semigroup Theory. He will give seminars at:

- Heriot-Watt University, Monday 12 April at 2 pm: Cellular algebras and inverse semigroups, contact Mark Lawson (M.V.Lawson@hw.ac.uk)
- University of Manchester, Tuesday 11 May at 4 pm: Braid groups and transformation semigroups, contact Mark Kambites (Mark. Kambites@manchester.ac.uk)
- University of York, Wednesday 19 May at 2:15 pm: Applications of order-preserving partial permutations, contact Victoria Gould (varg1@york.ac.uk)

Dr East will be based at the Universities of St Andrews and York during his visit. This visit is partially supported by an LMS Scheme 2 grant.

# VISIT OF PROFESSOR E. PELINOVSKY

Professor Efim Pelinovsky (Institute of Applied Physics, Nizhny Novgorod, Russia) will visit the UK from 12 to 30 April 2010. His research area is nonlinear waves in fluids, with a special interest in tsunamis, freak waves and internal solitary waves. He will give seminars at:

- Sheffield, 21 April; contact Michael Ruderman (M.S.Ruderman@sheffield.ac.uk)
- Plymouth, 23 April; contact Vasyl
   Vlasenko (vasyl.vlasenko@plymouth.ac.uk)
- Loughborough, 28 April; contact Roger Grimshaw (R.H.J.Grimshaw@lboro.ac.uk)
- Lancaster, 30 April; contact Peter McClintock (p.v.e.mcclintock@lancaster.ac.uk)

Professor Pelinovsky will be based at Loughborough during his visit, hosted by Roger Grimshaw. For further details consult seminar web pages. This visit is supported by an LMS Scheme 2 grant.

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## VISIT OF DR MACIEJ BORODZIK

Dr Maciej Borodzik (University of Warsaw) will be visiting the following universities whilst in the UK:

- University of Aberdeen, 24–26 May
- University of Edinburgh, 26–30 May
- University of Warwick, 30 May 5 June

Dr Borodzik will give talks on recent work in Algebraic Geometry on May 25 at Aberdeen, 28 May at Edinburgh and 3 June at Warwick.

For further information contact Stefan Friedl (s.k.friedl@warwick.ac.uk). This visit is supported by an LMS Scheme 2 grant.

## VISIT OF PROFESSOR V. MATVEEV

Professor Vladimir Matveev (University of Burgundy, Dijon, France) will be visiting the UK from 10 to 24 May 2010. Professor Matveev works in several areas of mathematical physics, including an algebro-geometric approach to integrable nonlinear PDEs of the KdV type, Darboux transformations method, quantum theory of scattering with long range and rapidly oscillating potentials, and inverse spectral problems. Professor Matveev will give seminars at:

- Loughborough University, 12 May at 2 pm: 30 years of Darboux transformation method for integrable PDEs and their difference versions, contact Karima Khusnutdinova (K.Khusnutdinova@lboro. ac.uk)
- University of Leeds, 13 May at 4 pm: Difference deformations of Darboux-Poschl-Teller potentials, contact Allan Fordy (A.P.Fordy@ leeds.ac.uk)
- Imperial College, 18 May at 4 pm: Positon solutions for nonlinear integrable systems and positon-soliton interactions, contact Darryl Holm (d.holm@imperial.ac.uk)

Professor Matveev will be based at Loughborough during his visit. For further information contact Karima Khusnutdinova (K.Khusnutdinova@lboro.ac.uk). This visit is supported by an LMS Scheme 2 grant.

## VISIT OF DR D. TALALAEV

Dr Dmitry Talalaev (Moscow State University and ITEP, Moscow) will be visiting the UK from 26 April to 8 May 2010. He will give a series of lectures on his work in quantum integrable systems including:

• Loughborough, 28 April, Quantum spectral curve method

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- Imperial College, London, 30 April, Quantum elliptic Calogero–Moser model
- Manchester, 4 May, *Quantum Gaudin model* For more information contact Professor

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For more information contact Professor Alexander Veselov (A.P.Veselov@lboro. ac.uk). The visit is supported by an LMS Scheme 2 grant.

# VISIT OF PROFESSOR G.G. YIN

Professor G.G. Yin (Wayne State University) will visit the UK during May. Professor Yin's research area is stochastic systems, applied stochastic processes and applications, stochastic recursive algorithms, identification, signal processing, and control and optimization. He will give talks at

- University of Strathclyde, 4 May, 3:30 pm: Hybrid switching diffusions
- Swansea University, 7 May, 3:00 pm, Stability of switching diffusions
- Oxford University, 14 May, 2:15 pm, Hybrid switching diffusions and applications to stochastic controls

For further information contact Dr Chenggui Yuan (C.Yuan@swansea.ac.uk). This visit is supported by an LMS Scheme 2 grant.

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### NEWSLETTER

# **INTERNATIONAL LOGICIANS**

Visits of the followings international logicians to the School of Mathematics of the University of East Anglia will take place in Spring 2010:

- Lajos Soukup from the Rényi Institute of Mathematics, Budapest, Hungary will be visiting from 23 April to 23 June 2010
- Robert Bonnett from the University of Savoie, Chamberix, France, will be visiting from 4 to 31 May 2010; his visit will be supported by the INFTY Research Network
- Uri Abraham from the Ben Gurion University of Negev, BerSheva, Israel
- István Juhász from the Hungarian Academy (supported by INFTY) one week visit in April-May 2010
- Katherine Thompson from the Kurt Gödel Research Center in Vienna, Austria, one week visit in April–May 2010



- James Cummings from the Carnegie Mellon University in Pittsburgh, USA likely to be coming for a one week visit
- Tamara Servi from the University of Portugal, Lisbon likely to be coming for a one week visit

For further information contact Mirna Dzamonja (M.Dzamonja@uea.ac.uk).

# THEORY OF QUANTUM COMPUTATION

The 5th conference on the Theory of Quantum Computation, Communication and Cryptography (TQC) will be held at the University of Leeds from 13 to 15 April 2010. Quantum computation, quantum communication, and quantum cryptography are subfields of quantum information processing, an interdisciplinary field of information science and quantum mechanics.

> The TQC conference series focuses on theoretical aspects of these subfields. The objective of the conference is to bring together researchers so that they can interact with each other and share problems and recent discoveries. It will consist of invited talks, contributed talks, and a poster session with a prize given by the Heilbronn Institute. The invited speakers are:

- Kae Nemoto (National Institute of Informatics, Tokyo)
- Frank Verstraete (University of Vienna)
- Ronald de Wolf (Centrum Wiskunde & Informatica, Amsterdam)
- Anton Zeilinger (University of Vienna)

Further details and registration are available online at http://tqc2010. leeds.ac.uk. The conference is supported by an LMS Conference grant. PC Tł

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# POSTGRADUATE GROUP THEORY CONFERENCE

The Postgraduate Group Theory Conference (PGTC) is an annual conference organised by and for current research students in all areas of group theory and related topics. The aim of the conference is to allow research students to: meet and discuss their research in a relaxed environment; exchange ideas and get a flavour of the research done by their fellow group theorists; gain experience at presenting their research outside of their own departments and meet pre-eminent researchers in their area.

The 12th PGTC will be held at the University of St Andrews from 28 to 30 June 2010. There will be two talks from invited speakers:

- Martin Liebeck (Imperial College London)
- Claas Röver (NUI Galway)

All other talks will be contributed by the students themselves. For more information visit the website at www-algebra.mcs.st-and. ac.uk/~pgtc2010. The conference is funded by an LMS Scheme 8 (Postgraduate Research Conference) grant.

# PURE MATHEMATICS POSTGRADUATE CONFERENCE

The Pure Mathematics Postgraduate Conference 2010 will take place on 15 April 2010 at Newcastle University. The two main speakers will be:

- Anne Thomas (Oxford, UK)
- Alexei Miasnikov (McGill, Canada)

The main focus of the event will be talks by PhD students. For further information visit the website at: www.students.ncl.ac.uk/ nathan.barker/Imsnorth. There is some funding available (courtesy of an LMS Scheme 8 grant) for postgraduates to attend the event.

# **MATHEMATICAL BILLIARDS**

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The Department of Mathematics, University of Bristol, is hosting a Postgraduate Research Conference titled Mathematical Billiards and their Applications from 21 to 24 June 2010. Mathematical billiards represents one of the most popular and best understood classes of dynamical systems. Over the past 30 years, connections have been made with geometry, theoretical and mathematical physics, number theory, acoustics, optics, thermodynamics, spectral theory etc. Furthermore, mathematical billiards demonstrate a broad variety of behaviours including regular, chaotic and mixed phase space dynamics. This meeting aims to bring together UK-based postgraduates in contact with this exciting field and re-introduce them to the building blocks of billiard theory via lectures presented by the following speakers:

- Leonid Bunimovich (Georgia Institute of Technology)
- Péter Bálint (Institute of Mathematics, Budapest)
- Martin Sieber (University of Bristol)
- Carl Dettmann (University of Bristol)
   All postgraduates will be given the op

All postgraduates will be given the opportunity for a contributed talk, and others if there is space in the programme. Poster contributions are also very welcome. There is a registration fee of  $\pounds$ 40 for attending the conference, which includes the cost of the conference dinner.

Participants should seek funding from their own institution in the first instance. Limited funds may be available to contribute towards essential costs of attendance at the workshop, including those related to caring responsibilities, for postgraduates who apply by the **30 April** deadline; please request this when registering. More information can be found at www.maths.bris.ac.uk/~maxog/MathematicalBilliards.htm or by contacting Orestis Georgiou (maxog@bristol.ac.uk).

This workshop is funded by an LMS Scheme 8 (Postgraduate Research Conference) grant.

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### NEWSLETTER



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# WOMEN IN MATHEMATICS TWO-DAY MEETING

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## Thursday 15 and Friday 16 April 2010

Isaac Newton Institute for Mathematical Sciences, 20 Clarkson Road, Cambridge CB3 0EH

### Day 1 (Women in Mathematics Day) Thursday 15 April 2010

| 10.30–11.00 | Registration and coffee                                     |
|-------------|-------------------------------------------------------------|
| 11.00–11.40 | Julia Gog (University of Cambridge)                         |
|             | Disease dynamics: From equation to experiment (and back)    |
| 11.40–12.20 | Hinke Osinga (University of Bristol)                        |
|             | The mystery of chaos in the Lorenz equations                |
| 12.20-13.00 | Nina Snaith (University of Bristol)                         |
|             | Random matrices and Riemann zeros                           |
| 13.00–14.00 | Lunch and Poster Session                                    |
| 14.00–16.30 | Postgrad/postdoc talks                                      |
| 16.30-17.00 | Теа                                                         |
| 17.00–18.00 | Meet the European Mathematical Society Women in Mathematics |
|             | Committee                                                   |
| 18.00–19.00 | Reception                                                   |
| 19.30       | Dinner at Newnham College                                   |

### Day 2 Friday 16 April 2010

| 9.00-9.50   | Alison Etheridge (University of Oxford)                                                   |
|-------------|-------------------------------------------------------------------------------------------|
|             | The pain in the torus: modelling populations in a spatial continuum                       |
| 10.00-11.00 | Initiatives for women mathematicians – UKRC/INI/LMS                                       |
| 11.00–11.30 | Coffee                                                                                    |
| 11.30–12.45 | Funding opportunities for mathematicians                                                  |
| 12.45-13.00 | Introduction to discussion groups                                                         |
| 13.00–13.40 | Lunch                                                                                     |
| 13.40-14.30 | Coffee and cake and discussion groups                                                     |
| 14.30-15.00 | Feedback                                                                                  |
| 15.00-16.00 | Bodil Branner (Technical University of Denmark)                                           |
|             | Why mathematics continues to fascinate me – surgery in holomorphic dynamics in particular |
| 16 00-16 30 | Tea and departures                                                                        |

To register for the event go to www.newton.ac.uk/cgi/wim-apply by 26 March 2010.

If you are not able to attend for the whole event then it is possible to register for just one of the two days. If you have any queries please contact Sarah Fendt (S.Fendt@ newton.ac.uk).

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### NEWSLETTER

# LMS INVITED LECTURES





# Stability of Queuing Networks

# Maury Bramson (University of Minnesota)

## 12–16 April 2010, WIMCS (and hosted by Swansea University)

An abstract of the material to be covered in Professor Bramson's Lectures is shown on the opposite page. The lectures are divided into the following parts:

- 1. Introduction
- 2. The Classical Networks

- 4. Stability of Queueing Networks 5. Applications
- 3. Instability of Subcritical Queueing Networks 6
  - 6. Join the Shortest Queue Networks

Much of the material in these lectures can be found in the Springer Lecture Notes volume 1950, *Stability of Queueing Networks*, a preliminary version of which can be found at www.math.umn.edu/~bramson.

In addition to the lecture series given by Professor Bramson, there will be a small number of invited guest lecturers elaborating on the theme that innovative rigorous mathematics can give fundamental insight into applications in Optimisation and OR. Professor Adam Letchford (Lancaster University) will give a lecture on *The Travelling Salesman Problem* and another on *Optimization over Cones*. Professor Jörg Fliege (Southampton) and Professor Jianfeng Feng (Warwick) will also give lectures.

All mathematicians are welcome to attend the lectures, and research students are particularly encouraged. There will be a registration fee of  $\pm 30$ , payable on arrival. The registration fee will be waived for research students.

Financial support is available to support participants. Priority will be given to research students and mathematicians who would benefit from attending the lectures, but who would otherwise be prevented from attending by financial constraints.

To express interest in attending the LMS Invited Lectures, contact Stephen Williamson, WIMCS Administrator (administrator@wimcs.ac.uk). For further information, see www.wimcs.ac.uk/lmsinvitedlectures.html.



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## STABILITY OF QUEUEING NETWORKS

Maury Bramson University of Minnesota

Abstract. Queueing networks constitute a large family of stochastic models, involving 'jobs' or 'customers' that wait in queues until being served. Once its service is completed, a job moves to the next prescribed queue, with the procedure continuing until the job leaves the network.

Questions involving the stability (that is, positive recurrence) of these models have received substantial attention since the early 1990s. Although the theory is currently incomplete, there are positive criteria for stability as well as examples where stability fails in a nonobvious way. Most of these results pertain to HL networks, where only the first job at a queue receives service at a given time.

In these lectures, we summarize the stability theory for queueing networks, with an emphasis on HL networks. After introducing the basic concepts, we recall some of the classical theory and next give examples of unstable networks. We then develop the technique of fluid limits, which we employ to show stability in different cases. Lastly, we briefly discuss certain more general networks, including in detail the Join the Shortest Queue Networks.

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# LMS HARDY LECTURER 2010

The 2010 LMS Hardy Lecturer is Professor Hiraku Nakajima (Kyoto University). During his visit to the UK he will give talks at Edinburgh, Leeds and Oxford, followed by the Hardy Lecture at the Society meeting in London on 2 July.

### Quiver varieties and cluster algebras

Edinburgh: 17 June. Further details tbc. Organiser: Iain Gordon (igordon@ed.ac.uk)

Quiver varieties and cluster algebras Leeds: 22 June. Further details tbc. Organiser: William Crawley-Boevey (W.Crawley-Boevey@leeds.ac.uk)

*Quiver varieties and double affine Grassmann* Oxford: 28 June. Further details tbc. Organiser: Tamás Hausel (hausel@maths.ox.ac.uk).

Instanton counting and Donaldson invariants London: 2 July. Further details tbc. Organiser: Isabelle Robinson (isabelle.robinson@Ims.ac.uk)

Professor Raphaël Rouquier (Oxford) is the second speaker at the London meeting. There should also be a programme of events that day for graduate students.

For further information contact the local organisers. For general enquiries contact lsabelle Robinson (isabelle.robinson@lms.ac.uk).

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### NEWSLETTER

# BANACH ALGEBRAS, OPERATOR SPACES AND QUANTUM GROUPS

A working semester on Banach Algebra and Operator Space Techniques in Topological Group Theory, including two short conferences, will be held in the Research Visitors' Centre of the School of Mathematics at Leeds University from 10 May to 30 June 2010. The conferences will take place from 27 to 29 May and 28 to 30 June. There will be instructional talks during the semester, outwith the conferences.

In 1964 Eymard extended the definition of the Fourier algebra A(G) from the classical, abelian case to any locally compact group G. A major new avenue of research was opened up 15 years ago when Ruan showed that A(G), viewed as an operator space, was amenable precisely when G was amenable. Recently, the operatorspace approach to quantum groups has provided a new language in which to consider these algebras, as well as providing new algebras to study; there is an emerging synthesis in which properties of both  $L^1(G)$  and A(G) appear as special cases of a more general approach.

The meeting will provide an opportunity to work with leaders in the field; the conferences will focus on recent and, hopefully, new results. Invited speakers at the conferences will be:

- Yemon Choi (Manitoba)
- Garth Dales\* (Leeds)
- Matt Daws\*(Leeds)
- Fereidoun Ghahramani (Manitoba)
- Alexander Helemskii (Moscow)
- Zhiguo Hu\* (Windsor)
- Monica Ilie (Lakehead)
- Tom Körner\* (Cambridge)
- Viktor Losert\* (Vienna)
- Zinaida Lykova (Newcastle)
- Matthias Neufang\* (Carleton)

- Alexei Pirkovskii (Moscow)
- Charles Read (Leeds)
- Zhong-Jin Ruan\* (Urbana-Champaign)
- Volker Runde\* (Edmonton)
- Pekka Salmi (Oulu)
- Adam Skalski\* (Lancaster)
- Nico Spronk\* (Waterloo)
- Dona Strauss (Leeds)
- Wojciech Szymanski (Odense)
- Michael White (Glasgow)
- Stuart White (Newcastle)
- George Willis\* (Newcastle, New South Wales)
- Gilda Yousefi (Teheran)

\*Also giving instructional lectures

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The conferences are supported by an LMS conference grant. Some funding will be available for UK-based PhD students. More detailed information is available at www.maths.leeds.ac.uk/pure/analysis/conf1/main.html. For organisational queries contact David Salinger (d.l.salinger@ leeds.ac.uk).

## ICFT10

The 14th Annual UK Meeting on Integrable Models, Conformal Field Theory and Related Topics will take place at the University of Kent in Canterbury from 16 to 17 April 2010. Speakers include:

- Murray Batchelor (ANU, Australia)
- Olalla Castro-Alvaredo (City, UK)
- Gesualdo Delfino (Trieste, Italy)
- Joseph Minahan (Uppsala, Sweden)

Limited support for research students is available. For more information visit the conference website at www.kent.ac.uk/ims/ personal/tcd/webpages/icft10/index.html. The conference is supported by an LMS Conference grant.

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### NEWSLETTER

# BILL MORTON'S 80TH BIRTHDAY CONFERENCE

Bill (K.W.) Morton was Professor of Numerical Analysis at the Universities of Reading, Oxford and Bath and a pioneer in the development of finite difference, finite element and finite volume methods for the numerical solution of PDEs. He will turn 80 on 28 May this year and to celebrate we have organised a Birthday Conference on Saturday 29 May 2010 in Oxford with the following speakers:

- John Barrett (Imperial)
- Mike Giles (Oxford),
- Heinz Kreiss (UCLA/KTH)
- Nancy Nichols (Reading)
- Stan Osher (UCLA)
- Alastair Spence (Bath)
- Gil Strang (MIT)

There will also be a dinner the same evening in the SCR at Balliol College. Numbers for the dinner are restricted to 60 persons. The conference is organised by: Endre Süli, Nick Trefethen, Andy Wathen (Numerical Analysis Group, Oxford University). For further information visit the website at www.maths.ox. ac.uk/events/morton80.

# BRITISH TOPOLOGY MEETING

The 25th British Topology Meeting will take place at Merton College, Oxford, from Monday 6 to Wednesday 8 September 2010. The meeting will start at 3 pm on Monday afternoon and end at 5 pm on Wednesday afternoon. The meeting will be an opportunity to reinforce the strengths of the community of British topology and aims to represent many of the facets of current topology. There will be invited and contributed talks in a broad range of topics in topology and a poster session. Postgraduates are particularly encouraged to participate, and there will be some funding available to assist postgraduates attending the meeting. The invited speakers are:

- Tara Brendle (Glasgow)
- Victor Buchstaber (Manchester)
- Ralph Cohen (Stanford)
- Ursula Hamenstädt (Bonn)
- Pascal Lambrechts (Louvain-la-Neuve)
- Vladimir Markovic (Warwick)
- John Roe (Penn State)
- Michael Weiss (Aberdeen)

For more information visit the BTM webpage at www.maths.ox.ac.uk/groups/topology/ btm2010. The registration form can be found there. There will be a registration fee of  $\pounds$ 15 per day, though the organisers hope to be able to offer a subsidised rate for postgraduates. The registration deadline for those wishing to contribute talks is **15 May**.

The organisers are Jeffrey Giansiracusa (giansira@maths.ox.ac.uk) and Oscar Randal-Williams (randal-w@maths.ox.ac.uk). The event is being supported by the London Mathematical Society and Merton College.

## **ERGODIC THEORY**

A one-day *Ergodic Theory Meeting* will take place on Friday 7 May at the Mathematics Department, University of Surrey. This is part of a series of collaborative meetings between Bristol University, Liverpool University, Manchester University, Queen Mary, Surrey University and Warwick University, supported by an LMS Scheme 3 grant from the London Mathematical Society. The speakers will be:

- Renaud Leplaideur (University of Brest) The Central Limit Theorem for dimension of Gibbs measures
- Andrew Ferguson (University of Warwick) Escape rates for Gibbs measures
- Matt Nicol (University of Houston) Extreme value theory for Sinai dispersing billiards and a class of piecewise hyperbolic diffeomorphisms

More information is available on the website: http://personal.maths.surrey.ac.uk/ st/H.Bruin/oneday\_workshop\_7\_5\_2010.html.

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The London Mathematical Society



# **ERGODIC THEORY & ARITHMETIC DYNAMICS**

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### LMS-EPSRC Short Course

Queen Mary, University of London, 25–30 July 2010 Organiser: Professor Franco Vivaldi

Course outline and prerequisites

Ergodic theory is concerned with the probabilistic description of dynamical systems with complicated behaviour. The use of ergodic theory to solve arithmetical problems and the application of arithmetical methods to dynamics are significant research trends. This course will develop the basic ergodic theory and will analyse two areas of arithmetic from a dynamical systems perspective. There will be three lecture series:

- I. Ergodic theory and dynamical systems (Tom Ward, UEA)
- II. Expansions in non-integer bases and their dynamics (Nikita Sidorov, Manchester)
- III. p-adic dynamics (Franco Vivaldi, QMUL).

The programme also includes example classes, and guest lectures by Ben Green (Cambridge) and Graham Everest (UEA).

This course has an interdisciplinary character. It is aimed for PhD students in dynamical systems or number theory, but it will also be of interest to students and postdoctoral researchers in other areas of mathematics. For further information see: www.maths.qmul.ac.uk/~ft/ETAD.html.

### Application

Applications should be made using the registration form available via the Society's website at: www.lms.ac.uk/activities/rmc/sc/54poster.html.

The closing date for applications is **Friday 11 June 2010**. Numbers will be limited and those interested are advised to make an early application. All applicants will be contacted approximately two weeks after this deadline; we will not be able to give information about individual applications before then.

### Fees

- All research students registered at a UK university will be charged a registration fee of £100 (in the case of EPSRC-funded research students, this fee should be paid by their departments from their Doctoral Training Account; for non-EPSRC research students, their department might be prepared to pay the fee). They will not be charged for subsistence costs.
- UK-based postdocs will be charged a registration fee of £100, plus half the subsistence costs (£194), £294 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 (£388), £638 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.

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

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.

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### NEWSLETTER



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# **COMPUTATIONAL MATHEMATICS & SCIENTIFIC COMPUTING**

### LMS-EPSRC Short Course

### University of Durham, 25–31 July 2010

Organisers: Dr James Blowey and Dr Max Jensen

### Course outline and prerequisites

This course will develop the theory, application and solution of approximation techniques when applied to certain classes of Partial Differential Equations. No prior knowledge of Galerkin methods will be assumed. There will be four main series, each with five lectures.

- I. Finite Element Approximation of Eigenvalue Problems (Daniele Boffi, Università di Pavia)
- II. Finite Element Methods for Elliptic Boundary Value Problems (Susanne Brenner, Louisiana State University)
- III. Numerical Methods for the Time-Dependent Maxwell System (Peter Monk, University of Delaware),
- IV. Finite Element Solution of Problems from Mathematical Biology (Paolo Zunino, Politecnico di Milano),

For further information and full description of the content see www.maths.dur.ac.uk/nass.

### Application

Applications should be made using the registration form available via the website above.

The closing date for applications is **Monday 31 May 2010**. Numbers will be limited and those interested are advised to make an early application. All applicants will be contacted approximately two weeks after this deadline.

### Fees

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- All research students registered at a UK university will be charged a registration fee of £100 (in the case of EPSRC-funded research students, this fee should be paid by their departments from their Doctoral Training Account; for non-EPSRC research students, their department might be prepared to pay the fee). They will not be charged for subsistence costs.
- UK-based postdocs will be charged a registration fee of £100, plus half the subsistence costs (£210), £310 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 (£420), £670 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.

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

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.

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# COMPUTATIONAL SCIENCE IN METROLOGY

A conference on *Computational Science in Metrology* will take place at the National Physical Laboratory, Teddington on 21 April 2010. The conference aims to bring together measurement scientists, manufacturing engineers, quality professionals and statisticians from backgrounds such as manufacturing, testing, design, and academia, with a common interest in research, development and applications in areas related to mathematics and computing in metrology. It will be an opportunity to discuss the latest developments in the Software Support for Metrology programme, covering topics such as:

- Bayesian analysis
- International guides for uncertainties and software
- Molecular modelling

There will be a poster fair for those with an interest in this particular area of work to exhibit. For further information email Nancy Moore (nancy.moore@npl.co.uk) or visit the website at www.npl.co.uk/events/computational-science-in-metrology.

## REGULARITY ISSUES OF NONLINEAR PDE

A Wales Analysis one-day workshop on *Regularity Issues of Nonlinear PDE* will be held at the Swansea University on Friday 30 April 2010. The speakers will be:

- Marie-Françoise Bidaut-Veron (Université de Tours, France)
- Vincenzo Vespri (Unversity of Florence, Italy)
- Jan Kristensen (Oxford)

The organiser is Vitali Liskevich (Swansea). Limited support is available for young researchers. For further information contact Vitali Liskevich (V.A.Liskevich@swansea.ac.uk). The workshop is funded in part by an LMS Scheme 3 grant and the Wales Institute of Mathematical and Computational Sciences (WIMCS).

# SWIMMING MICROORGANISMS

A conference on Individual and Collective Fluid Mechanics of Swimming Microorganisms will take place at the University of Glasgow from 6 to 8 July 2010. Significant progress has been made over the last 25 years in the development and analysis of mathematical models of the fluid dynamics of individual swimming microorganisms and populations thereof. The conference will bring together those who have participated in founding and extending this research, together with younger scientists and people from related scientific disciplines to debate the significance of previous work and to discuss optimum future directions of research. More specifically, the behaviour and fluid dynamics pertaining to individuals underpins the dynamics of populations and applicability to real-world problems. The transition of scale and complexity from swimming individual algal cells to bioconvection of populations, to the genesis of red tides, together with associated transport phenomena, is a specific example of the research topics. The invited speakers are:

- Rachel Bearon (Liverpool)
- Martin Bees (Glasgow)
- Ricardo Cortez (Tulane University, USA)
- Saktipada Ghorai (IIT Kanpur, India)
- Raymond Goldstein (Cambridge)
- Daniel Grunbaum (University of Washington, USA)
- Nicholas Hill (Glasgow)
- Akitoshi Itoh (Tokyo Denki University, Japan)
- John Kessler (University of Arizona, USA)
- Eric Lauga (UCSD, USA)
- Sriram Ramaswarmy (University of Bangalore, India)

The registration deadline is **14 May 2010**. For further information and registration visit the website at www.maths.gla.ac.uk/~mab/ SC/SwCells10.htm. The conference is supported by an LMS Conference grant.

## NEWSLETTER



### MATHEMATICS EDITOR/ASSOCIATE MATHEMATICS EDITOR Ref: SPR/ME

### **Position Summary**

To continue to develop a successful publishing programme concentrated on undergraduate and master's level textbooks in mathematics, under guidance of and in coordination with the Editorial Director for Mathematics.

### **Key Responsibilities**

- To communicate externally with authors, series editors, and referees through the evaluation process of each submission. To communicate internally with other editorial functions, production, marketing etc.
- To prepare accepted proposals for all phases of the publishing process.

### Skills/Experience

### Essential:

- Educated to university degree level in mathematics
- Publishing experience
- Spoken and written English at native-speaker level
- Excellent organisation and interpersonal skills with attention to detail
- Availability to travel to international conferences

### Desirable:

Postgraduate level in mathematics

Please note: Springer can adapt the position as appropriate to the level of experience presented by the successful applicant. Please send your CV and covering letter, stating salary expectations and quoting the job reference (SPR/ME) to jobs@biomedcentral.com.

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### No. 391 April 2010

EPSRC

The London Mathematical Society



### **MODEL THEORY**

### LMS-EPSRC Short Course

University of Leeds, 18–23 July 2010 Organiser: Professor Dugald Macpherson

#### Course outline and prerequisites

Model theory is a branch of mathematical logic which studies the extent to which properties of mathematical structures can be expressed in formal logical languages. It has an internal theory (for example, stability theory and generalisations) and widespread interaction with other parts of mathematics. This course will develop both the pure theory, and some connections to real and complex algebraic and analytic geometry. There will be three main series, each with five lectures.

- I. Introduction to geometric stability theory (David Evans, UEA)
- II. Introduction to o-minimality with applications (Marcus Tressl, Manchester)
- III. Geometric stability and Zariski geometries (Boris Zilber, Oxford)

These will be complemented by examples classes and by one-off lectures by Angus Macintyre (QMUL), Jonathan Pila (Bristol) and Anand Pillay (Leeds). For further information see www.maths. leeds.ac.uk/modeltheory.

### Application

Applications should be made using the registration form available via the Society's website at: www.lms.ac.uk/activities/rmc/sc/51poster.html.

The closing date for applications is **Friday 28 May 2010**. Numbers will be limited and those interested are advised to make an early application. All applicants will be contacted approximately two weeks after this deadline; we will not be able to give information about individual applications before then.

#### Fees

- All research students registered at a UK university will be charged a registration fee of £100 (in the case of EPSRC-funded research students, this fee should be paid by their departments from their Doctoral Training Account; for non-EPSRC research students, their department might be prepared to pay the fee). They will not be charged for subsistence costs.
- UK-based postdocs will be charged a registration fee of £100, plus half the subsistence costs (£140), £240 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.

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

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.

### NEWSLETTER

The London Mathematical Society



GRESHAM COLLEGE

# THE LONDON MATHEMATICAL SOCIETY JOINTLY WITH GRESHAM COLLEGE

Tuesday 4 May 2010 6pm at the Museum of London, Barbican

# Indra's Pearls: Geometry and Symmetry

# Professor Caroline Series University of Warwick

A Buddhist myth describes the heaven of Indra as containing a net of pearls, each of which was reflected in its neighbour, so that the whole Universe was mirrored in each pearl. Join Caroline Series on the path from basic mathematical ideas to simple algorithms whose repetition creates delicate fractal filigrees which are only now beginning to be fully explored.

### ADMISSION FREE

NO RESERVATIONS REQUIRED - FIRST COME, FIRST SERVED

Museum of London, London Wall, London EC2Y 5HN Nearest underground stations: Barbican, St Paul's, and Moorgate 020 7831 0575 enquiries@gresham.ac.uk www.gresham.ac.uk

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## INTERNATIONAL MATHEMATICS COMPETITION

### Preliminary Announcement

The 17th IMC for University Students is being co-organized by University College London and hosted by the American University in Bulgaria, Blagoevgrad, Bulgaria from 24 to 30 July 2010. Every participating university is invited to send several students and one teacher. Individual students are welcome. The competition is planned for students completing their first, second, third or fourth year of university education and will consist of two sessions of five hours each. Problems will be from the fields of Algebra, Analysis (Real and Complex), Geometry and Combinatorics. The working language will be English. Over the previous sixteen competitions we have had participants from more than one hundred and ninety three institutions in forty five countries. The timetable is as follows:

- July 24 Arrival and Registration
  - 25 Opening Ceremony, Additional Registration, Meeting of the Jury
  - 26 First Exam Day
  - 27 Second Exam Day
  - 28 Meeting of the Jury
  - 28 Closing Ceremony, Final Dinner
  - 30 Departure

Although this is an individual event, the Universities traditionally divide their participants into groups of four each. The number of students in the teams is, however, not fixed. The professor who accompanies the students is expected to be a member of the Jury.

The problems will be chosen at the Meeting of the Jury on July 25 from those received in advance by the President of the Jury, Professor John Jayne. The problems proposed should be precisely formulated and accompanied by a detailed solution. The problems should be in fields of Algebra, Analysis (Real and Complex), Geometry and Combinatorics. The problems given at the last sixteen Competitions can give a general idea of the level expected (see the IMC web site www.imcmath.org.uk). Additional topics may be also included.

The students' work will be evaluated by Team Leaders and other Professors and Assistant Professors using criteria provided by the Jury.

Participants are invited to confirm their intention to participate, either by on-line registration or by email, by the end of May 2010, providing the following information: University; City; Country; Leader of the team (name, email address); Students (number); Mailing address; Email address; Fax number.

The participants from some countries will need a visa to enter Bulgaria. Contact your travel agent or the Bulgarian Consulate in your country for details. If necessary, the organizers will post formal invitations for participation in the Competition.

The Competition Fee, which will include accommodation and meals from dinner on the 24 July to breakfast on the 30 July, has not yet been finalized.

Send all confirmations of participation and arrival details to John Jayne at the email address below. If you would like a copy of the competition poster, send your request with postal address to Professor John E. Jayne, IMC President, Department of Mathematics, University College London, Gower Street, London WC1E 6BT (tel: +44-20-7679 7322; fax: +44-20-7419 2812; email: j.jayne@ucl.ac.uk; web: www.imcmath.org.uk).

### NEWSLETTER

# **RECORDS OF PROCEEDINGS AT MEETINGS**

### **ORDINARY MEETING**

held on *Friday 26 February 2010* at University of Durham. About 35 members and visitors were present for all or part of the meeting.

The meeting began at 3.30 pm, with the President, Professor A.J. MACINTYRE, FRS, FRSE, in the Chair.

Four people were elected to Associate membership: D. B. Bradley-Williams, S.W. Goatham, H.D.B. Piyaratne, S. Sivanesan; 14 people were elected to Ordinary Membership: L. Cattaneo, J.D. Cranch, M. Crochemore, R. Dietmann, J.P. Elmer, P.D. Lawson, D.M. Maclagan, J.L. Rodrigo, S.I. Santos, K.J. Swanepoel, R. Thomas, D. Ueltschi, G. Williams, J. Zacharias; and one person was elected to membership under a reciprocity arrangement with the society shown: R.J. Sanchez-Garcia (American Mathematical Society).

The Records of the Proceedings of the Ordinary Meetings of the Society held on 15 July 2009 and 16 September 2009, and the AGM on 20 November 2009 were signed as a correct record.

No members signed the book or were admitted to the Society.

Professor G.M. STALLARD, Chair of the Women in Mathematics Committee, gave a brief description of Mary Cartwright and her achievements. She then handed over to Professor P.A. CLARKSON, member of the Women in Mathematics Committee, who introduced the lecture given by Professor Ana Achúcarro on *Maths in the sky: the secret life of cosmic strings*.

After tea, Professor Clarkson introduced the Mary Cartwright Lecture given by Professor Ruth Gregory on *Fun with extra dimensions*.

The President then thanked the organisers for arranging an interesting programme, and declared the meeting closed.

After the meeting, a dinner was held at Van Mildert College.

## MARY CARTWRIGHT MEETING

### Report

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The 2010 Mary Cartwright Meeting took place on Friday 26 February 2010 at Durham University and was attended by about 35 members and visitors. The Meeting was opened by LMS President Professor Angus Macintyre and began after formal business.

The first talk was given by Professor Ana Achúcarro of Leiden University on *Maths in the* 

sky: the secret life of cosmic strings. This was an excellent survey of both mathematical and experimental aspects of the formation of the universe, together with methods to uncover its secrets from observations of the cosmic microwave background. The audience were treated to some cutting-edge research in the form of a movie clip, displaying numerical simulations of cos F gav wit ing of hol din pre for sib Ha tio der a d

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of multiple reconnection events for colliding cosmic strings.

Professor Ruth Gregory of Durham University gave this year's Mary Cartwright Lecture on Fun with extra dimensions. This highly entertaining talk introduced the audience to a range of cosmological phenomena, including black holes and braneworlds in spacetimes with extra dimensions. This inspiring talk spanned an impressive range of topics, from the mathematical formulation of these theories through to possible observational consequences at the Large Hadron Collider. In response to a technical question at the end of the talk, Professor Gregory demonstrated notable stamina by performing a detailed calculation on the blackboard.

After the meeting a dinner was held in the Lakeside Room of Van Mildert College.

> Paul Sutcliffe University of Durham



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Louis Legendre

THE MISTAKEN PORTRAIT **OF LEGENDRE** 

For over a century one familiar portrait has been displayed wherever Legendre's work has been discussed in historical writing. It is included in books on history of mathematics such as those by Struik and Eves. It has been printed repeatedly to illustrate articles about Legendre, and it appears on many mathematical websites. Generations of mathematicians have known and recognized Legendre by that portrait. But the portrait has nothing to do with Adrien-Marie Legendre. It is not his likeness. Instead it portrays a politician named Louis Legendre, an active participant in the French Revolution, no relation to the mathematician. This shocking and rather embarrassing revelation has emerged in the last few years, supported by strong evidence, as explained by Peter Duren (University of Michigan) in an article in the AMS Notices (vol. 56, no. 11 (2010) 1440-1443). Visit www.ams.org/notices/200911/rtx091101440p. pdf to read the complete article.

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### NEWSLETTER

## PANDA

The next one-day meeting in the Patterns, Nonlinear Dynamics and Applications (PANDA) series, supported by the LMS under Scheme 3, will take place in the Department of Mathematical Sciences, University of Bath, on Monday 26 April 2010. The theme of the meeting is *Delay Differential Equations*.

There will be two hour-long pedagogical talks, aimed at research students and post-docs in applied mathematics, given by Yuliya Kyrychko (Bristol) and Jan Sieber (Portsmouth), as well as a number of shorter contributions. Research students and post-docs are warmly encouraged to attend, and there are funds to cover travel expenses. Further details are available at http://people.bath. ac.uk/jhpd20/panda.

### REVIEWS

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Leonhard Euler and the Bernoullis by M.B.W. Tent, 2009, A.K. Peters, 296 pp, £22.00, ISBN 978-1-56881-464-3.

Although some adults will enjoy reading Leonhard Euler and the Bernoullis, it's a book written for young readers. It is probably best suited to those between 14 and 16 years of age, although one can imagine a younger reader being captivated by this story of mathematics and mathematicians. It has 39 short chapters, and is written in the form of a novel. It is rich in more or less realisticsounding dialogue, as imagined by an author who has already written similar books about Carl Friedrich Gauss (1777–1855) and Emmy Noether (1882-1935). Tent had a career teaching middle school mathematics in the United States and is excellent at writing history of science for adolescents.

Leonhard Euler (1707–83) was arguably the most influential and productive mathematician of all time. His collected works fill more than 80 volumes. He single-handedly made number theory a part of mainstream mathematics and did seminal work in fields like combinatorics that would not even be named until long after his death. He was born in Basel, Switzerland, but spent most of his career in St Petersburg and Berlin.

Basel also produced a family of mathematicians named Bernoulli. Brothers Jacob (1654–1705) and Johann (1667–1748) were pioneers of Leibniz' differential and integral calculus. Collectively, their achievements and influence in mathematics were as great as Euler's. Johann's son Daniel (1700–82) was one of Euler's greatest contemporaries. At least half a dozen minor mathematicians are to be found among Daniel's brothers, cousins and nephews.

The Bernoulli and Euler families were closely intertwined: Euler's father attended Jacob's lectures when in university, Euler was mentored by Johann during his own student days, and he subsequently worked with Daniel at the St. Petersburg Academy. Essentially, Tent's book is a saga of this Basel clan, including the extended Bernoulli family and Leonhard Euler.

Not surprisingly, Tent's novel also teaches some European history. For example, the action opens with the persecution of the Huguenots, which resulted in a Bernoulli patriarch fleeing from Antwerp to Frankfurt. Later on, readers learn about St. Petersburg and Berlin during their 'Great' times: the reigns of Peter, Frederick and Catherine.

Even more importantly, young readers are exposed to some real mathematics. Interspersed within the story are polar coordinates, the St. Petersburg Paradox in probability theory, Euler's polyhedral formula, magic squares, and some number theory. Much of this is done through narrative prose, but Tent communicates some mathematical content in dialogue, for example when Jacob explains his polar coordinates to his younger brother. bu vei Jac cer Be the no las en the gra 1 em Wł are ing we mi L for it

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No. 391 April 2010

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me exorThe Bernoullis were a quarrelsome lot, but Tent keeps her story positive. There is very little about the falling out between Jacob and Johann at the end of the 17th century and nothing at all about Daniel Bernoulli's cold relations with Euler in the middle of the next. The story ends not with the familiar legend of Euler's last day on earth, but with an uplifting, if entirely fictional, conversation between the elderly Euler and his ten-year-old grandson.

Tent's attention to detail, both mathematically and historically, is excellent. Whatever factual quibbles I might have are so minor as not to be worth mentioning. A bibliography would have been a welcome addition for those students who might be inspired to further reading.

Leonhard Euler and the Bernoullis is not for the mathphobic. On the other hand, it assumes only a modest mathematical background, one quite appropriate to the intended audience. It is a welcome addition to the mathematics education literature and would make an excellent gift for a young person with mathematical interests.

> Rob Bradley Adelphi University

> > JASON ROSENHOUSE

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The Monty Hall Problem: The Remarkable Story of Math's Most Contentious Brain Teaser by Jason Rosenhouse, 2009, OUP, 208 pp,  $\pm$ 15.99, ISBN 978-0-19-536789-8.

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The classic Monty Hall problem is as follows: A game-show host offers a contestant the choice of one of three doors: behind one door lies a new car, and behind each of the other two lies a goat. After the contestant chooses a door, the host opens one of the other doors which reveals a goat, picking a door at random if he has two goats to choose from. He then offers the contestant the opportunity to switch doors – whichever door the contestant chooses is opened to reveal a goat or a car. What is the best strategy?

The answer? The contestant should always switch – this gives them a  $2/_3$  chance of winning the car. Many people find this unintuitive, feeling that the remaining two options are equally good.

I should admit that I don't generally use the Monty Hall problem with students, as I am not convinced anyone is enlightened by having it explained. But I have had fun teasing people with it, from my girlfriend 35 years ago, to a senior QC at a dinner. However, my first thought was: how can anyone write a whole book on this? Well, Jason Rosenhouse has, and it's surprisingly good.

> I like his opening claim that probability is unintuitive: in fact the whole book is about counter-intuitive results. Chapter 1, *Ancestral Monty*, gives a history going back to the 3prisoners problem posed by Martin Gardner in 1959, the translation to the game show format in 1975, and the well-told story of the Marilyn vos Savant column in *Parade*, which led to a series of articles in which she countered arguments, some apparently from mathematicians, that there is no advantage in switching.

> Rosenhouse proceeds to *Classical Monty*, in which he uses the problem

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### NEWSLETTER

to introduce solution methods using (a rather confusing) enumeration of sample spaces and Monte Carlo simulations. In *Bayesian Monty* a variation is introduced in which the host himself does not know where the car is, which provides a justification for ideas of independence and Bayes theorem. New versions come thick and fast, and are used to widen the discussion to different interpretations of probability.

Things get more technical in Progressive Monty in which there are n doors and a strategy in which the contestant sticks to the same door until there are two left, and then switches, is shown to be optimal. Miscellaneous Monty deals with more variations than I thought possible, with multiple players, two hosts, and so on, while Cognitive Monty explores people's responses to the problem. Philosophical Monty considers how versions of the problem have been used by philosophers to contrast beliefs about the probabilities for single cases of the game with beliefs about long-run statistical properties. This gets difficult. The book finishes with a fine, and presumably fairly exhaustive, set of references.

The book is chatty and welcoming, and the author's enthusiasm is infectious. There is, however, a rather uneven use of mathematics, with binomial coefficients introduced without definition on page 11, and fairly basic ideas of probability coming much later. I am not sure of the intended audience: serious enthusiasts may find it too basic, while beginners will grind to an exhausted halt well before the end.

To be honest, after 194 pages of Monty Hall I still am not inclined to use the problem in my efforts to inspire people about the joys of probability, statistics and risk. But I am impressed at how much material can be hung onto a single problem, and the author has my sincere admiration for being such a dedicated, if not obsessive, exponent.

> David Spiegelhalter University of Cambridge

# **CALENDAR OF EVENTS**

This calendar lists Society meetings and other events publicised in the *Newsletter*. Further information can be obtained from the appropriate LMS *Newsletter* whose number is given in brackets. A fuller list of meetings and events is given on the Society's website (www.lms.ac.uk/newsletter/calendar.html). 4

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### **APRIL 2010**

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6-9 BMC/BAMC 2010, Edinburgh (387) 6-9 BCME7, Manchester (385) 6-9 Spatial Network Models for Wireless Communications, INI, Cambridge (386) 6-9 UK Graduate Modelling Camp, Oxford (389)12-14 Stochastics, Control and Finance Workshop, Imperial College London (387) 12-14 Geometry, Analysis, and Logic of Groups Workshop, Newcastle (391) 12-16 LMS Invited Lectures, Maury Bramson, 13-15 Theory of Ouantum Computation. Communication and Cryptography Conference, Leeds (391) 14 LMS Northern Regional Meeting, Newcastle (391) 14 Lecture Day, Durham (388) 14-17 Group Theory Conference, Naples, Italy (390) 15 Pure Mathematics Postgraduate Conference 2010, Newcastle (391) 15-16 Women in Mathematics Two-Day Meeting, Cambridge (391) 16-17 Integrable Models, Conformal Field Theory and Related Topics Meeting, Kent (391)19-21 Mathematical Neuroscience Conference, ICMS, Edinburgh (386) 21 Computational Science in Metrology Conference, NPL, Teddington (391) 26 Patterns, Nonlinear Dynamics and Applications Meeting, Bath (391) 30 Regularity Issues of Nonlinear PDE Workshop, Swansea (391)

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### **MAY 2010**

4 Indra's Pearls: Geometry and Symmetry, LMS–Gresham College Lecture, London (391)

7 Ergodic Theory Meeting, Surrey (391) 10-14 Numerical Solution of the Painlevé Equations ICMS Workshop, Edinburgh (386)

16-22 Algebraic Methods in DynamicalSystems Conference, Będlewo, Poland (389)19 Stochastic Differential Equations Workshop, Swansea (391)

24-26 Wales Mathematics Colloquium 2010, Gregynog (390)

24-28 Uncertainty Quantification ICMS Workshop, Edinburgh (386)

27-29 Banach Algebra and Operator Space Techniques in Topological Group Theory Conference I, Leeds (391)

29 Bill Morton's 80th Birthday Conference, Oxford (391)

### **JUNE 2010**

7-11 Functional Analysis Meeting, Valencia, Spain (388)

14-18 Hodge-theoretic Reflections on the String Landscape ICMS Workshop, Edinburgh (386)

17 LMS Hardy Lecture, Edinburgh (391)

20-22 Geometry and Topology Conference, Durham (388)

21 LMS South-West and South Wales Regional Meeting, Cardiff

21-24 Mathematical Billiards and their Applications Conference, Bristol (391)

22 LMS Hardy Lecture, Leeds (391) 22-25 Group Representation Theory and Related Topics Conference, Lausanne, Switzerland (386)

22-25 Mathematical Challenges and Modelling of Hydroelasticity ICMS Workshop, Edinburgh (386)

28 LMS Hardy Lecture, Oxford (391)

28-30 Banach Algebra and Operator Space
Techniques in Topological Group Theory
Conference II, Leeds (391)
28-30 Postgraduate Group Theory
Conference, St Andrews (391)

# JULY 2010

# 2 LMS Meeting, Hardy Lecture, London (391)

5-9 Symplectic Geometry and Transformation Groups ICMS Workshop, Edinburgh (386) 5-15 Numerical Analysis of Multiscale Problems EPSRC–LMS Durham Research Symposium, Durham (391)

6-8 Individual and Collective Fluid Mechanics of Swimming Microorganisms Conference, Glasgow (391)

12-13 Reconstructing and Understanding Climate Change over the Last Few Millennia and the Holocene ICMS Workshop, Edinburgh (386)

18-23 Model Theory, LMS–EPSRC Short Course, Leeds (391)

18-25 Non-Perturbative Techniques in Field Theory EPSRC–LMS Durham Research Symposium, Durham (391)

19-20 Mathematics and the Arts, Paris, France (388)

24-30 17th IMC for University Students, Blagoevgrad, Bulgaria (391)

25-30 Ergodic Theory & Arithmetic Dynamics LMS–EPSRC Short Course, London (391) 25-31 Computational Mathematics & Scientific Computing LMS–EPSRC Short Course, Durham (391)

26-28 Combinatorial Algorithms Workshop,
 King's College London (390)
 26-30 Group-Theoretical Methods in Physics

Colloquium, Northumbria (390)

### **AUGUST 2010**

17-18 International Conference of Women Mathematicians 2010, Hyderabad, India (391)

19-27 International Congress of Mathematicians 2010, Hyderabad, India (386)

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# H. PERIGAL LMS member 1868–1897



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Henry Perigal, FRAS, MRI Member of the Physical Society Treasurer of the Royal Meteorological Society Fellow of the Royal Microscopical Society Henry Perigal was an amateur mathematician known principally for an elegant geometric proof of Pythagoras' Theorem. See http://plus.maths.org/issue16/features/perigal/index.html. ۲