

# NEWSLETTER

#### No. 401 March 2011

# Society Meetings and Events

#### 2011

21-25 March LMS Invited Lectures [page 3]

3-8 April LMS Short Course, Oxford

Thursday 5 May LMS Spitalfields Day INI, Cambridge

Friday 6 May Women in Mathematics Day, London [page 11]

Tuesday 17 May LMS–Gresham Lecture, London [page 13]

#### **Tuesday 14 June**

Midlands Regional Meeting, Birmingham [page 6]

Wednesday 29 June LMS Popular Lecture, London [page 3]

Friday 1 July London

**Tuesday 19 July** Northern Regional Meeting, Leeds [*page* 15]

#### NEWSLETTER ONLINE:

Go to www.lms.ac.uk/ newsletter

# NEW DIRECTOR AT ISAAC NEWTON INSTITUTE

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The University of Cambridge announced in January 2011 that Professor John Toland, FRS, will be the next Director of the Isaac Newton Institute for Mathematical Sciences and N.M. Rothschild & Sons Professor of Mathematical Sciences. He will succeed Sir David Wallace in October 2011. Professor Toland served as President of the London Mathematical Society from 2005 to 2007 and the LMS extends its congratulations to Professor Toland on his prestigious appointment.

Professor Toland has been Professor of Mathematics at the University of Bath since 1982, and from 2002 until 2010 he was also Scientific Director of the International Centre for Mathematical Sciences (ICMS) in Edinburgh. He held an EPSRC Senior Research Fellowship during 1997-2002. He has been honoured with many distinctions and awards throughout his career including the LMS Senior Berwick Prize (2000); Honorary Fellowship of University College London (2008); Honorary DSc: Queen's University Belfast (2000), University of Edinburgh (2007), Heriot-Watt University (2007), University of Essex (2009). He was elected

Fellow of the Royal Society in 1999, and of the Royal Society of Edinburgh in 2003.

For more information on Professor Toland's appointment visit www.admin.cam.ac.uk/news/dp/ 2011011101.

# GOOD PRACTICE

Although nearly 40% of mathematical sciences graduates are women, only about 4% of UK mathematics professors are female. Relative to men. women are much less likely to go on to become academic mathematicians. Of course, this trend is not unique to mathematics, but the drop-off rate for women in mathematics is particularly high and this should be a concern to mathematics departments. The recent International Review of Mathematics highlighted concern about the low numbers of female mathematicians in the UK

The LMS Women in Mathematics Committee, in collaboration with the Committee of Heads of Departments of Mathematical Sciences, have set up a Good Practice Award specifically for mathematics departments to recognise and

#### NEWSLETTER

celebrate good employment practice for women working in mathematics. The scheme complements initiatives such as Athena SWAN.

There are now six departments that have signed up as supporters and are working towards 'Champion' status. The LMS Women in Mathematics Committee is keen to encourage more departments to sign as GPA supporters and to support the departments already involved.

A Good Practice Award workshop will be held on **Thursday 19 May** to provide participants with the knowledge and tools they need to begin the process of working towards Good Practice Award Champion status. If your department is considering becoming a GPA supporter, then this workshop will provide a starting point. If you are already a Good Practice Award Supporter, then this workshop will help you work towards submitting your application for Champion status. The workshop will be held at De Morgan House. Registration will be from 10.30am and the workshop will begin at 11.00am running until no later than 4.00 pm.

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Participants will:

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- find out more about what is involved in making an application for a Good Practice Award
- begin to think about how your department can put in place what you need to begin your departmental/school self assessment process and to develop an action plan
- consider and share what good practice exists in mathematics departments
- make useful contacts with other departments active in promoting the careers of women in mathematics
- get ideas about the people you can look to for help.

The workshop is designed for two participants from each department. We would

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Editorial office: newsletter@lms.ac.uk; London Mathematical Society, De Morgan House, 57–58 Russell Square, London WC1B 4HS (t: 020 7637 3686; f: 020 7323 3655)

Events calendar: please send updates and corrections to calendar@lms.ac.uk

General Editor: Mr A.J.S. Mann (a.mann@gre.ac.uk) Reports Editor: Dr S.A. Huggett (s.huggett@plymouth.ac.uk) Reviews Editor: Dr C.M. Roney-Dougal (colva@mcs.st-and.ac.uk) Administrative Editor: S.M. Oakes (newsletter@lms.ac.uk)

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#### No. 401 March 2011

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strongly encourage you to send two people to the workshop as there will be an exercise designed to get departments thinking about how to move forward with their self assessment process and this will work best if done in pairs. If you wish to register then please send

the contact details of your participants to womeninmaths@lms.ac.uk. More details about the GPA are available at www.lms.ac.uk/ content/good-practice-award.

> Cathy Hobbs, Chair, GPA Steering Group Gwyneth Stallard, Chair, WiM Committee

# LMS POPULAR LECTURES 2011

The Popular Lectures is an annual event organised by the London Mathematical Society. The 2011 event will be held at the Institute of Education, London, on Wednesday 29 June and will be repeated at Birmingham University in September. The speakers are Colva Roney-Dougal (St Andrews University) and Hilary Weller (University of Reading). Further details will follow in the April Newsletter.

# LMS INVITED LECTURER 2011

# Professor Emmanuel Candès (Stanford)

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# **Compressed Sensing**

# 21–25 March 2011 Centre for Mathematical Sciences, Cambridge

Emmanuel Candès will give an eight-lecture minicourse, at a level suitable for graduate students, on *Compressed Sensing*. This is a subject very much at the interface of pure and applied mathematics and the lectures should interest a wide audience.

There will also be one-hour lectures by:

- Anders Hansen (Cambridge)
- Vincent Rivoirard (Paris-Dauphine)
- Carola Schönlieb (Cambridge)
- Jared Tanner (Edinburgh)

College accommodation will be available. Funding is available for research students from UK universities and a limited amount of funding is available for others. Please email Ims2011@maths.cam.ac.uk for more details.

For further details see: www.dpmms.cam.ac.uk/~bjg23/candeslectures.html.

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### NEWSLETTER

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#### No. 401 March 2011

# PHILIP LEVERHULME PRIZES

In the field of Mathematics and Statistics the following have been awarded a 2010 Leverhulme prize:

- Caucher Birkar, DPMMS, University of Cambridge
- Timothy Browning, School of Mathematics, University of Bristol
- Tom Coates, Department of Mathematics, Imperial College London
- Radek Erban, Mathematical Institute, University of Oxford
- Nicolai Meinshausen, Department of Statistics, University of Oxford

These prizes, with a value of £70,000 each, are awarded to outstanding scholars who have made a substantial and recognised contribution to their particular field of study, recognised at an international level, and where the expectation is that their greatest achievement is yet to come. For further information visit the website at www.leverhulme.ac.uk/news/awards/plp.cfm.

# ALF VAN DER POORTEN

Professor Alfred Jacobus (Alf) van der Poorten who was elected a member of the London Mathematical Society on 15 May 1975, died on 9 October 2010, aged 68.

David Hunt writes: Alf was born in Holland in 1942 and after many difficulties his family migrated to Sydney in 1951. Alf shone academically at both Sydney Boys High School and then as a mathematics cadet at the University of New South Wales. He obtained four different degrees from the university but was always destined to become an academic mathematician.

Alf's research was in diverse aspects of number theory. His doctoral supervisor was Kurt Mahler, under whom he wrote a thesis *Simultaneous algebraic approximations to functions*, but in his early years he also came under the influence of George Szekeres. Alf collected a large network of research colleagues. He published about 180 papers with some fifty collaborators. Many of his publications were in some sense expository. Of particular note was his book *Notes on Fermat's Last Theorem*.

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In 1979 Alf was appointed to a full professorship in Mathematics at Macquarie University, which is also in Sydney. He remained in this position until his retirement in 2002. During this period he became heavily involved in the senior management of the University both as Head of School and as President of the Academic Senate. His contributions to mathematics in Australia were manifold including chairing a working party which reported to the Australian Research Council on mathematics research in Australia and two years as President of the Australian Mathematical Society.

In recognition of his services to mathematics in Australia, Alf was awarded the inaugural George Szekeres Medal of the Australian Mathematical Society in 2002. He was also appointed a Member of the Order of Australia, AM, in 2004.

Alf was an inveterate traveller, especially to MSRI and to Bordeaux, where he was awarded *Docteur Honoris Causa* in 1998. But above all else he was dedicated to his family. Alf is survived by his mother, his wife Joy, children David and Kate, and four grandchildren.

### ANALYSIS WORKSHOP

An Analysis Workshop will take place at the Department of Mathematics, Imperial College London from 16 to 18 March 2011. Invited speakers include:

- Dominique Bakry (Toulouse)
- Karl-Theodor Sturm (Bonn)
- Clement Mouhot (Cambridge)

Some support for young research and graduate students will be available. For more information visit the website at www2.imperial. ac.uk/~vk2007/workshop2011 or contact the organiser Bogusław Zegarlinski (b.zegarlinski@ imperial.ac.uk). The workshop is supported by an LMS Conference grant.

#### NEWSLETTER

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# LONDON MATHEMATICAL SOCIETY MIDI ANDS REGIONAL MEETING

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# Tuesday 14 June 2011

#### Poynting Large Lecture Theatre, University of Birmingham

#### **Programme:**

**2.00** Opening of the meeting

Miles Reid (Warwick) Rings and varieties

- **3.15 Shaun Stevens** (University of East Anglia) Representations of p-adic groups and the local Langlands conjectures
- 4.15 Tea/Coffee
- 4.45 Catharina Stroppel (Bonn) TBA
- 6.30 Dinner at University Staff House

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 (goodwin@maths.bham.ac.uk). The cost of the dinner will be approximately  $\pounds 25$ , including drinks.

The meeting precedes a workshop on *Representation Theory* from 15 to 18 June. For further details visit http://web.mat.bham.ac.uk/S.M.Goodwin/Ims2011/ 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. M

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#### No. 401 March 2011

## MATHEMATICS POLICY ROUND UP

# International Review of Mathematical Sciences 2010

Following the recent International Review of Mathematical Sciences (IRM), there was a public launch of the Review Panel's report and findings at an EPSRC 'Town Meeting' on Friday 28 January 2011 at the Senate House, University of London.

After an introduction by Professor Sir Adrian Smith, Director General, Knowledge and Innovation, there was an overview of the International Review from the Chair of the International Review Steering Committee Professor Tim Pedley. Professor Margaret Wright, Chair of the International Review Panel, then presented the main findings and recommendations of the Review and particularly stressed that the actions taken by EPRSC since the 2004 IRM 'have significantly contributed to the invigoration of mathematical sciences research'. She said, that 'Overall mathematical sciences research in the UK is excellent on an international scale.' Wright also stressed the 'importance of adopting a "united we stand" approach as the most appropriate perspective on mathematical sciences research in the context of this review'. The final report will be available shortly. For more information visit the EPSRC website at www.epsrc.ac.uk.

#### **Education Bill**

The Education Bill was introduced into Parliament on 26 January 2011 as the First Reading (http://tinyurl.com/5v7lc5n). The Education Bill takes forward the legislative proposals in the Schools White Paper, *The Importance of Teaching*, and measures from the Department for Business, Innovation and Skills to improve skills, including two elements of the reforms to higher education funding. Measures in the Bill include:

 extending the Secretary of State's powers to intervene where schools are underperforming;

- introducing smarter school inspections. Ofsted will now focus only on four core elements of schools – pupil achievement, teaching, leadership and behaviour and safety; and
- measuring our education system against the best in the world. Ofqual will compare our exam standards against the highestperforming countries.

In addition, the Bill will strengthen teachers' powers to deal with bad behaviour. It gives teachers the power to search for any items schools ban that disrupt learning, like mobile phones and video cameras. It also gives schools the final say in expelling violent pupils and protects teachers from pupils making false allegations.

#### **Big Bang Fair**

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This year's *Big Bang Fair* (www.thebigbangfair. co.uk), which is the "UK's biggest single celebration of science and engineering for young people", is taking place at ExCeL in the London Docklands from 10 to 12 March 2011. We are delighted that there is a Maths Zone this year with a range of exhibits, theatre productions and workshops – including *Maths Busking*, the *Maths of Gameshows*, *Learning Maths Through Robots*, the *Mathematics of Card Tricks*, *Living in a Complex World* and many more.

#### Record applications for university

Figures published by UCAS in January 2011 show that there have been 583,501 applications for places on degree courses this year. This is a 5.1% increase compared with this time last year. The figures show a dramatic rise in the number of university applications over the past four years. In 2007, there were 402,831 applications. There has been an 8.6% increase in applications to the Mathematical & Computer Sciences group with 128,274 applications compared to 118,089 last year. More information is available at http://tinyurl.com/66upwbg.

(Continued on the next page.)

7

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# THE LONDON MATHEMATICAL SOCIETY

#### NEWSLETTER

#### Call for evidence on Spending Review

The Science and Technology Committee has requested written submissions on the science and research budget allocations for 2011/12 to 2014/15. The Committee has taken the decision to invite representations from the wider scientific community and other interested parties over the coming months on the future impact of the budget allocations.

Andrew Miller MP, Chair of the Science and Technology Committee, said:

"Following the Committee's evidence session last week with Research Council chief executives, and our session with David Willetts in November, the Committee has decided to call for written submissions from the wider scientific community on the impact of the science and research budget allocations for 2011/12 to 2014/15."

Details are available at http://tinyurl. com/5wck6r2.

A transcript of evidence given to the Science and Technology Committee in January 2011 by the Chief Executives of the Research Councils is available at http://tinyurl.com/66pe2tm

#### Educating the Next Generation of Scientists

The House of Commons Committee of Public Accounts published the report *Educating the next generation of scientists* in January 2011. The Rt Hon Margaret Hodge MP, Chair of the Committee of Public Accounts, said:

"There has been an impressive increase in the availability and take up of GCSE Triple Science; and, at the same time, attainment in maths, biology, chemistry and physics at this level has improved. But the picture is far from rosy. ... [Amongst other things] there has been slow progress in increasing the number of specialist physics and maths teachers. The resources for recruiting science and maths graduates into teaching should be focused on what works. We need a coherent national approach to ensure that the key success factors – such as GCSE Triple Science, specialist teachers, good-quality science facilities, good careers advice and programmes to increase take-up and achievement – are available throughout the country, especially in the most disadvantaged communities."

The report is available at http://tinyurl.com/ 6hbzrxp.

#### **National Curriculum Review**

On 20 January 2011 the Secretary of State for Education, Michael Gove, announced a major review of the National Curriculum in England (the review does not include post-16 secondary education).

The review will be led by the Department for Education, supported by an advisory committee and expert panel made up of top teachers, academics and business representatives. The review will:

- replace the current substandard curriculum with one based on the best school systems in the world, providing a world-class resource for teachers and children;
- consider what subjects should be compulsory at what age; and
- consider what children should be taught in the main subjects at what age.
   Further information about the review is available at http://tinyurl.com/62pknl7.

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#### Online learning in higher education

A recent report by the Online Learning Task Force, *Collaborate to compete: Seizing the opportunity of online learning for UK higher education*, says that "Universities and colleges need to make online learning a central part of organisational strategies if they are to meet rapidly changing student demands and stay competitive in the global higher education market." It goes on to say that "Those UK higher education institutions that are prepared to make online learning a central focus will be able to develop responsive, engaging and interactive education that is both high quality and cost effective."

The full report is available at www.hefce. ac.uk/pubs/hefce/2011/11\_01/

Dr John Johnston Mathematics Promotion Unit

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# MATHEMATICS HE SUMMIT

#### Report

The Mathematics HE Summit took place at the University of Birmingham on 12 January 2011, operated by the Maths, Stats & OR (MSOR) Network as part of the Mathematical Sciences HE Curriculum Innovation Project within the National HE STEM Programme. This brought together: Heads of Mathematics or their representatives from 25 universities offering mathematics degrees (about half of those in England and Wales); Education representatives from the Institute of Mathematics and its Applications, the Royal Statistical Society, the Operational Research Society and the Council for the Mathematical Sciences; members of the National HE STEM Programme, sigma and the MSOR Network; and several individuals.

The day was chaired by Professor Duncan Lawson and opened with a debate, in which Professor Alexandre Borovik of the University of Manchester proposed and Jon McLoone of Wolfram Research opposed the motion 'We believe that memory, subject knowledge and technical fluency remain vital for undergraduate mathematicians in the digital age'. Following this, breakout groups discussed the topics: 'We can't let them graduate unless...'; 'If maths students can't communicate in writing or speak in public – is that my problem?'; and 'If most maths graduates "aren't confident" in handling unfamiliar problems – should we care?' After lunch the Summit received feedback from the morning discussions and an update on employer engagement activity from the Mathematical Sciences Strand by David Youdan. The Summit heard and discussed presentations from Professor Jeremy Levesley on Taking control of the assessment agenda and Dr Neil Challis on What do the students think about their Maths degrees? A final set of breakout sessions considered the topic 'Imagine there is £100k-£150k in total available to support curriculum development across the sector, how best should this be targeted and what are the priority areas?'

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The National HE STEM Programme is a large-scale initiative funded by the Higher Education Funding Councils for England and Wales (HEFCE and HEFCW) which aims to address widening participation, curriculum innovation and higher-level skills in the workforce in Mathematical Sciences, Physics, Chemistry and Engineering, with a particular interest in the role of employers in these activities. The Mathematical Sciences Strand is overseen by a group of societies and others, comprising the LMS and the Institute of Mathematics and its Applications (IMA), the Royal Statistical Society (RSS), the Heads of Departments of Mathematical Sciences (HoDoMS), sigma and the MSOR Network. Within the Mathematical Sciences Strand, the MSOR Network is responsible for HE Curriculum Innovation – exploring current learning, teaching and assessment practices within mathematical sciences departments, and disseminating good practice. I am employed by the MSOR Network to operate this activity, which runs until July 2012.

Initial feedback from the Summit has been very positive. Michael Grove, National HE STEM Programme Director, said "It was great to see so many people from the mathematics community involved, and great to see so many people present with whom the Programme is currently working." The Summit provided a day of debate, provocative presentations and discussion which was captured by a group of volunteer note takers. The findings will be written up for dissemination and used by the MSOR Network when planning activities in the remainder of the Mathematical Sciences HE Curriculum Innovation Project. Further information and updates, including a blog and a podcast, are available via www.mathstore. ac.uk/hestem.

> Peter Rowlett HE Curriculum Innovation Advisor MSOR Network

9

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#### NEWSLETTER

#### www.lms.ac.uk/newsletter

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# FRONTIERS OF NEVANLINNA THEORY

Over the next year and a half there will be a series of four short workshops on the *Frontiers* of *Nevanlinna Theory* at University College London:

- Frontiers of Nevanlinna theory 1

   (a general introduction to all themes), 28–30 March 2011
- 2. *p*-adic function theory and arithmetic dynamics, 27–29 June 2011
- Applications of Nevanlinna theory to differential and functional equations, 17–19 April 2012
- Nevanlinna theory and number theory (especially connections with Diophantine approximation), 18–20 June 2012
- The interplay between Nevanlinna theory and these topics has not been pursued much in the UK and one of the main reasons behind running these meetings is to provide an introduction to some of these ideas and an opportunity for relevant researchers to mix. As such, each workshop will consist of a relatively small number of talks, with long breaks for discussions among participants. Speakers will include:
- Grigor Barsegian (NAS, Armenia)
- Walter Bergweiler (Kiel)
- Enrico Bombieri (IAS Princeton) tbc
- Abdelbaki Boutabaa (Blaise Pascal)
- William Cherry (North Texas) tbc
- Alexander Eremenko (Purdue)
- Alain Escassut (Blaise Pascal)
- Walter Hayman (Imperial College London)
- Gordon Heier (Houston)
- Aimo Hinkkanen (Illinois at Urbana-Champaign)
- Pei-Chu Hu (Shandong)
- Risto Korhonen (Eastern Finland)
- Ilpo Laine (Eastern Finland)
- Jim Langley (Nottingham)
- Michael McQuillan (Rome 'Tor Vergata')
- Min Ru (Houston)
- Joe Silverman (Brown)

- Yum-Tong Siu (Harvard)
- Kazuya Tohge (Kanazawa)
- Lucia di Vizio (Paris VII)
- Paul Vojta (Berkeley)
- Julie Tzu-Yueh Wang (Academia Sinica, Taiwan)
- Jörg Winkelmann (Ruhr-Universität Bochum)
- Chung-Chun Yang (Hong Kong University of Science and Technology)

For further details visit the website at www. homepages.ucl.ac.uk/~ucahrha/conferences/ frontiers. Contact Rod Halburd to register your interest (R.Halburd@ucl.ac.uk).

# PANDA

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The next meeting of the Patterns, Nonlinear Dynamics and Applications (PANDA) network will take place on Wednesday 6 April 2011 from 10.30 to 16.30 at the University of Surrey. The two invited review talks will be:

- Daniele Avitabile (Surrey) Equation-free methods for numerical continuation in agent-based models
- Tim Foxon (Leeds) Complex systems methods for informing energy decision-making in cities

The organisers invite contributed halfhour research talks on any topic within the PANDA remit, and particularly welcome offers of talks by postdocs and PhD students. A limited amount of funding is available for the reimbursement of travel expenses. They may also be able to make a contribution towards childcare expenses incurred specifically for the purpose of attending the meeting. Contact Rebecca Hoyle (r.hoyle@ surrey.ac.uk) if you would like to speak at the meeting.

For further details visit the website at http://personal.maths.surrey.ac.uk/st/ R.Hoyle/panda. The PANDA network is organised by Rebecca Hoyle (Surrey), Jon Dawes (Bath), Paul Matthews (Nottingham) and Alastair Rucklidge (Leeds), and is supported by an LMS Scheme 3 grant.

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No. 401 March 2011

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# WOMEN IN MATHEMATICS DAY 2011

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The next Women in Mathematics Day will be held on **Friday 6 May 2011** at De Morgan House, 57–58 Russell Square, London. Sessions will include talks by women mathematicians in a variety of appointments and at different career stages.

The organisers would be very grateful if all members could encourage women mathematicians, particularly students (including final-year undergraduates) and those at an early stage in their career, to attend this meeting. The Women in Mathematics Day provides a valuable opportunity to meet and talk with women who are active and successful in mathematics. Participants from previous meetings have found this opportunity useful and beneficial.

While women are especially encouraged to attend this day, men are certainly not excluded.

Any postgraduates, postdocs or research assistants wishing to give a talk during the afternoon session or present a poster should contact Peter Clarkson (P.A.Clarkson@kent.ac.uk).

To encourage high-quality posters, a £50 book token will be awarded for the poster that is judged to be the best Women in Mathematics Day Poster 2011.

#### Programme (tbc)

16.00-16.30 Tea

10.30–11.00 Registration and coffee

#### 11.00–13.00 Morning Session

Claire Gilson (Glasgow) Box and ball systems in integrable systems Joan Lasenby (Cambridge)

The Mathematics of making movies Rowena Paget (Kent) Set partitions and symmetric groups

#### 13.00–14.00 Lunch and poster session

14.15–16.00 Afternoon Session Postgraduate/Postdoc speakers Discussion groups



2008 Poster Competition Winner: Helena Mihaljevic-Brandt, Liverpool

Participants are invited to join us for dinner at a local restaurant after the event. If you would like to attend, please email Elizabeth Fisher (womeninmaths@lms.ac.uk). Please note that the dinner will **not** be paid for by the Society.

Limited funds are available to help with the travel costs of students attending the event. Further details are available from Elizabeth Fisher at the Society (contact details below).

To register contact Elizabeth Fisher (womeninmaths@lms.ac.uk). The day is free for students and  $\pounds 5$  for all others – payable on the day.

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#### NEWSLETTER

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No. 401 March 2011





# THE LONDON MATHEMATICAL SOCIETY JOINTLY WITH GRESHAM COLLEGE

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Tuesday 17 May 2011 6:00 pm at Barnard's Inn Hall

# Undecidable and Decidable Problems in Mathematics

# Professor Angus Macintyre, FRS

Queen Mary, University of London

Professor Macintyre, the current President of the London Mathematical Society, presents a survey and some reflections to mark the centenary of Turing's birth.

ADMISSION FREE

NO RESERVATIONS REQUIRED - FIRST COME, FIRST SERVED

Gresham College, Barnard's Inn Hall, Holborn, London EC1N 2HH Nearest underground: Chancery Lane 020 7831 0575 enquiries@gresham.ac.uk www.gresham.ac.uk

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### **NBFAS**

The North British Functional Analysis Seminar (NBFAS) normally meets three times per year, holding a one- or two-day meeting in one of its member institutions at which distinguished mathematicians, usually from overseas, are invited to lecture. The next NBFAS will take place at the University of Sheffield from 4 to 5 March 2011. The speakers are:

- Catalin Badea (Lille) Friday 4 March at 2.30 pm and 4.00 pm What is operator theory good for?
- Nicolas Monod (Lausanne) Saturday 5 March at 10.00 am and 11.30 am Fixed point theorems and derivations Littlewood and large forests

All interested are welcome to attend. The lectures will take place in Lecture Theatre 1 in the Hicks Building. For further information contact the NBFAS Secretary, Joachim Zacharias (Joachim.Zacharias@nottingham.ac.uk) or visit the website at www.maths.leeds.ac.uk/nbfas/ sheff11.html. The meeting is supported by an LMS Scheme 3 grant.

# TWISTORS IN GEOMETRY AND PHYSICS

A meeting on *Twistors in Geometry and Physics* in honour of Sir Roger Penrose, OM, will take place from 21 to 22 July 2011 at the Mathematical Institute, Oxford to mark his 80th birthday. Twistor theory is one of his most remarkable discoveries and continues to have wide application across geometry and physics. This meeting will focus on recent developments with speakers on applications both in pure mathematics and in mathematical physics. The speakers are:

- Nima Arkani-Hamed (IAS, Princeton)
- Mike Eastwood (ANU)
- Nigel Hitchin (Oxford)
- Andrew Hodges (Oxford)
- Claude LeBrun (Stonybrook)
- David Skinner (Perimeter Institute)

Research students are welcome. Further details and registration arrangements will be posted at www.maths.ox.ac.uk/~lmason/ rp80.html in April. For further inquiries contact Lionel Mason (lmason@maths.ox.ac.uk). The conference is supported by an LMS Conference grant.

# PANHELLENIC GEOMETRY CONFERENCE

The 10th Panhellenic Geometry Conference will take place at the University Conference Center of the University of Patras (in Rion) from Friday 27 to Saturday 28 May 2011. Following the tradition of the previous Panhellenic Geometry Conferences, the organisers invite researchers and postgraduate students who work on Geometry in a wide sense (Differential Geometry – Applications, Algebraic Geometry, Convex Geometry, Geometric Analysis, Algebraic Topology) to participate in this conference. The Invited Speakers are:

- Giovanni Calvaruso (Lecce)
- Hiroshi Tamaru (Hiroshima)

The registration deadline is **11 April 2011**. The conference dinner will be on Saturday 28 May. On Sunday there will be an excursion to the historic town of Kalavrita. For information visit the website at www.math. upatras.gr/~geomconf11 or contact Andreas Arvanitoyeorgos (arvanito@math.upatras.gr).



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# LONDON MATHEMATICAL SOCIETY NORTHERN REGIONAL MEETING

## Tuesday 19 July 2011

### MALL Seminar Room, Mathematics Building, University of Leeds

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#### Programme:

2.30 Opening of the meeting

**Gregory Cherlin** (Rutgers) The classification of homogeneous combinatorial structures

- 3.45 Tea/Coffee
- **4.15** Alexander Kechris (California Institute of Technology) The dynamics of automorphism groups of homogeneous structures
- 6.00 Dinner at University House

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 (J.K.Truss@leeds.ac.uk). The cost of the dinner will be approximately £30, including drinks.

The meeting forms part of a workshop on *Homogeneous Structures* from 19 to 22 July. For further details visit the website at www.maths.leeds.ac.uk/events/lmsnorth2011 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.

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#### ISAAC NEWTON INSTITUTE FOR MATHEMATICAL SCIENCES

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#### **CLOSING CONFERENCE**

#### 27 June - 1 July 2011

in association with the Newton Institute programme entitled Moduli Spaces (4 January – 1 July 2011)

**Organisers:** P.E. Newstead (Chair) (Liverpool), L. Brambila-Paz (CIMAT, Mexico), O. García-Prada (CSIC, Madrid), R. Thomas (Imperial).

Theme of conference: This workshop is the closing conference for the programme on *Moduli Spaces* and incorporates the 2011 workshop of the *Research Group Vector Bundles on Algebraic Curves*. The scientific programme will consist of around 15 invited talks and 12 contributed talks. The talks will cover various aspects of the theory of moduli and it is intended that talks on important developments within the semester programme will be included. The presentations will provide a state-of-the-art picture of the theory of moduli and will have significant impact on research in this area. The event is also being sponsored by the Interactions of Low-Dimensional Topology and Geometry with Mathematical Physics (ITGP) network of the European Science Foundation and the Clay Mathematics Institute.

Further information and application forms are available from the website at: www.newton.ac.uk/ programmes/MOS/mosw04.html. Closing date for the receipt of applications is **31 March 2011**.

### **INVERSE PROBLEMS IN SCIENCE AND ENGINEERING**

12-16 December 2011

in association with the Newton Institute programme entitled Inverse Problems (25 July – 21 December 2011)

Organisers: M. Brown (Cardiff), T. Fokas (Cambridge), W. Symes (Rice).

Theme of conference: Inverse problems are estimation problems in physical sciences and engineering. A problem as simple as weighing with a spring scale poses an inverse problem, but in recent years the term has come to be associated with the estimation of fields or distributed parameters. Many imaging problems partake of the same nature. Such problems are of critical importance in earth sciences, biomedicine, materials science and mechanical engineering, and in many other subjects. These problems also give rise to many interesting and difficult mathematical and computational science questions, and provide an arena in which contemporary mathematics can interact directly with the critical needs of scientists and engineers.

This workshop will bring together applied mathematicians and scientists working in a number of disciplines in which inverse problems play a central role. Along a series of three overview lectures and several invited seminars per day, the programme provides ample time for discussion and for contributed talks by the participants. The workshop is designed as an opportunity for specialists in various inverse problem types to exchange information and ideas.

Further information and application forms are available from the website at: www.newton.ac.uk/ programmes/INV/invw05.html. Closing date for the receipt of applications is **31 August 2011**.

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# THE KERVAIRE INVARIANT IN EDINBURGH

At the 2009 Atiyah80 ICMS Workshop, Hill, Hopkins and Ravenel announced a proof that there do not exist framed manifolds with Kervaire invariant 1 in dimensions  $2^k - 2$ for any  $k \ge 8$ . This solves the long-standing open Kervaire invariant problem (except for dimension 126, the only dimension which now remains open), which has been of central importance in homotopy theory for over 40 years.

An ICMS workshop on *The Kervaire Invariant* and Stable Homotopy Theory will take place from 25 to 29 April 2011 in Edinburgh. The principal objective of the workshop is to disseminate the methods used in the solution of the Kervaire invariant conjecture, and the use of equivariant and motivic methods more generally. It is also hoped to assess the prospects for using the methods to prove structural results about stable homotopy, and to report on progress which will have taken place by the time of the meeting. The confirmed speakers are:

- P. Akhmetev (Izmiran, Troitsk)
- W. Browder (Princeton)
- R. Bruner (Wayne State)
- M. Hill (Virginia)
- M. Hopkins (Harvard)
- J. Jones (Warwick)
- J. Lannes (École Polytechnique, Paris)
- T. Lawson (Minnesota)
- M. Mahowald (Northwestern)
- M. Mandell (Indiana)
- J. Morava (Johns Hopkins)
- E. Pedersen (Copenhagen)
- D. Ravenel (Rochester)
- S. Schwede (Bonn)
- V. Snaith (Sheffield)

The workshop is organized by John Greenlees (Sheffield), Andrew Ranicki (Edinburgh) and Neil Strickland (Sheffield). For further information visit the website at www.icms.org. uk/workshops/kervaire.

# **MATHEMATICS IN DEFENCE**

The 2011 *Mathematics in Defence* conference will take place at the Defence Academy of the United Kingdom, Shrivenham, Swindon on 20 October 2011.

Science and technology play an increasingly important role in equipping and supporting the armed forces. Mathematics is fundamental to these disciplines, providing a framework for understanding and solving the varied and complex problems faced. Mathematics and statistics are used to model military systems and scenarios. The information provided by mathematical models can be used to estimate system performance, suggest improvements or find weaknesses of real systems.

This conference brings together a wide variety of mathematical methods with defence and security applications. The conference programme will include keynote speakers, contributed presentations and poster sessions as well as refreshment breaks for informal discussions. It is intended for mathematicians, scientists and engineers from industry and academia, as well as government and military personnel who have an interest in how mathematics can be applied to defence problems. The conference will cover the following theme groupings:

Data analysis

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- Modelling and estimation
- Operational analysis
- Security
- Signal processing
- Statistical methods

This will be the second Mathematics in Defence Conference; the first, held in 2009, was attended by over 160 delegates from a range of organisations including QinetiQ, Dstl, Thales, the IMA, the MoD, academic establishments and international parties.

For a full list of the conference themes and further information visit the website at www.ima.org.uk/Conferences/maths\_in\_ defence2011.html. The closing date for abstract submissions is **30 April 2011**. 17

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#### UNIVERSITY OF BRISTOL MATHEMATICS DEPARTMENT

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### WORKSHOP ON MULTIPLE ZETA VALUES, MODULAR FORMS AND ELLIPTIC MOTIVES 3–6 May 2011

Organisers: H. Gangl (Durham), R. Hain (Duke), O. Patashnick (Bristol).

**Theme of conference:** To explore connections between multiple zeta values and elliptic modular forms, and also connections between their *l*-adic and motivic analogues. Such a relationship was first observed by Zagier on the multiple zeta values side in the early nineties. He related the number of linear dependencies among double zeta values to the dimension of cusp forms for  $SL_2(Z)$ , a result that was recently made very explicit by Gangl, Kaneko and Zagier. In a related context, the dimension of said cusp forms figures prominently in a conjectured dimension formula for MZVs given by Broadhurst and Kreimer, a refinement of Zagier's original dimension conjecture for which the upper bound has been proved by Goncharov and by Terasoma.

Around the same time as Zagier's explorations, a very similar connection was independently discovered on the Galois-theoretic side by Ihara and Takao, who observed that the dimension of these same cusp forms equals the dimension of congruences between depth 2 elements of the generators of the infinitesimal Galois action on the unipotent fundamental group of the thrice punctured line. Later Schneps gave an explicit correspondence between cusp forms and these congruences. Goncharov (in the mid-nineties) extended Zagier's original result to  $SL_3(Z)$  and in the process was led to introduce certain modular varieties which are mysteriously linked to Galois-theoretic objects, thereby already providing a first bridge between the two sides.

It is tempting to believe that a deeper understanding of these connections will arise from a good definition of 'elliptic zeta values', which should ideally degenerate to multiple zeta values, and from a deeper study of their algebraic properties. The above relationships and tentative notions have already stimulated work by many other authors. It is hoped that this conference will help synthesize these works and shed light on their motivic significance. There will also be a preparation day on 2 May. This day aims to provide background for students, as well as interested non-experts, through survey talks and more basic expositions of previous work, during which questions will be strongly encouraged, ideally leading to more in-depth discussions after the talks.

#### Conference speakers include:

- D. Broadhurst (Open University) F. Brown (Jussieu) B. Enriquez (Strasbourg) G. Felder (ETH Zürich) Y. Ihara (RIMS) M. Kaneko (Kyushu)
- H. Nakamura (Okayama)
- L. Schneps (Jussieu)
- R. Sharifi (Arizona)
- T. Terasoma (Tokyo)
- D. Zagier (Bonn and Paris)

Further information and application forms are available at: www.maths.bris.ac.uk/events/meetings/ uploads/8144Registration%20Form.pdf. Closing date for the receipt of applications is **4 April 2011**.

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# REASONING ABOUT PROGRAMS USING A SCIENTIFIC METHOD

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#### Report

Peter O'Hearn, the speaker, reminded us of the Verified Software Challenge (suggested by Hoare) of 'the feasibility of providing proofs of a variety of software systems with respect to a range of correctness properties'. He then described the use of the 'Scientific Method' in a tool which obtained specifications of pre and post conditions from large code bases. In this case the scientific method (as viewed by Pierce) is the process of forming an explanatory hypothesis via Abductive Inference.

The tool is called *Abduct* and includes abduction as well as the `usual' deduction. *Abduct* involves the application of separation logic, an extended version of Hoare's logic which includes the possibility of updatable field referencing from more than one point. The tool is composed of three phases:

No. 401 March 2011

- 1. the deduction of 'footprints' of commands and procedure preconditions
- the abduction or 'filling in' of missing parts of the precondition of the composed procedures
- the inductive generalisation of preconditions and eventually synthesis of postconditions.

Note that the intention is for the missing elements abduced during phase 2 to be of minimal order as well as consistent. Experiments in running the tool on large

open source programs were described and the proportion of procedures generating specifications indicated. The best result was the case of the IMap project which was composed of 226k lines of Code: in 450 seconds, specifications for two-thirds of its procedures were found. Some caveats were mentioned, however, for example the restrictiveness of corrective properties and that the (current) model ignores concurrency.

Dr Margaret West (BCS-FACS) University of Huddersfield

The BCS-FACS evening seminar was a joint event with the LMS held on Tuesday 6 November 2010.

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# REVIEWS

Driven to Innovate: A Century of Jewish Mathematicians and Physicists by Ioan James; Peter Lang 2009, 312 pp,  $\pm 25$ , 978-906165-22-2.

It is well known that many notable mathematicians and physicists have been of Jewish descent, but in what way did this affect their lives and contribute to their success? In *Driven to Innovate*, the distinguished mathematician (and former President of the LMS) Ioan James examines the lives of thirty-five Jewish mathematicians and physicists born in the nineteenth century. Whilst many suffered as a result of anti-Semitic prejudices or circumstances, James also shows how their Jewishness played a positive part in their achievements.

The book begins with a brief but essential overview of Jewish history that contains background concerning the community and ideology. James expresses his views and those of others as to why there have been so many prominent Jewish scientists, and explains what this collection of intellectuals has in common.

The biographies are grouped together chronologically with the majority from the second half of the century. They are written in a pacey popular style that is easy to read, and contain a wealth of appealing

anecdotes. As well as discussing the area of mathematics or physics that each person is noted for, James comments on their relationships with other mathematicians of the time, their family life and, where applicable, how they were received as a teacher. It is these insights into the characters of the subjects that I think students in particular will enjoy, and I would urge them to read this book.

One profile I particularly enjoyed, possibly because it concerns the only female mathematician in the book and one of a total of three women in all

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(something James is quick to apologise for) is that of Emmy Noether. Having previously read only brief accounts of her mathematics, I was intrigued by this account of her life and the perceptive comments on her personality given by her colleagues and students. Amongst other things, we learn that she had a great rapport with her students and enjoyed spending time with them on long walks discussing mathematical topics.

James' style, as I have said before, is popularist; he is not setting himself out to be an historian and thus it would be unfair to judge him as one. But readers might be entitled to expect more references and details of sources. In many of the chapters there are sizable quotations, which give illuminating and fascinating details about the character in question, but sadly the specific source for these quotes is sometimes lacking.

Despite this, it is a cleverly written book riddled with Jewish history which gives it both structure and purpose. James' view, that what these characters have in common is that they have all been in some way Driven to Innovate, seems valid and as one who is (in James' eyes) partially Jewish this book has helped me to understand something of my own Jewish heritage.

> Noel-Ann Bradshaw University of Greenwich



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#### No. 401 March 2011

Is God A Mathematician? by Mario Livio; Simon & Schuster 2009, 320 pp, \$26, ISBN-10: 0-74329-405-X. ( )

My father told a story of, when he was a boy in the 1920s, an old man who couldn't believe that the music he heard on his new "cat's whisker" wireless "has been floating around in the air all these years and I've never heard it". The similar puzzle 'do we invent mathematics or discover it?' prompts the further question 'is God a mathematician?' – the title of this thought-provoking book. This generalises beyond the realm of mathematics and, in the author's words, "did God create humans in his own image, or did humans invent God in their own image?"

This is challenging stuff, and easy answers are too much to expect, but Mario Livio, like a good philosopher, has justified the case for such questions in the context of the history and development of mathematical thought and practice. He has produced an erudite but highly readable book, bringing to life something of the personalities and vision of many of the great masters of our subject. Though inevitably selective, the book nevertheless captures in a series of vignettes many of the great advances which have shaped our familiar mathematical landscape, and builds a convincing picture of Wigner's "unreasonable effectiveness of mathematics" in describing and explaining the workings of the universe.

We are introduced to the "mystics" of the great Greek flowering of philosopher/mathematicians – Euclid's geometry, Plato's "selfevident mathematical truths", Pythagoras' "natural laws" – who first identified those mysteries which form the philosophical basis for the rest of the book with its insistent question. There follow the "magicians" – Archimedes, Galileo, Newton, Gauss – who were able to pull the "rabbits" of mathematical theory out of the "hat" of the physical world. Then, moving towards the present day, the statisticians and probabilists, who demonstrated the power of mathematics in understanding and predicting apparently uncertain or even random behaviour, the geometers, with their departure from the constraints of Euclid to a world apparently unencumbered with the requirement of physical reality, but later providing the essentials to understanding, or even describing, some of the most fundamental aspects of particle physics or cosmology. Finally the logicians, whose search for formalism in mathematics was halted in its tracks by "the stake through the heart" of Gödel's incompleteness theorems.

Each of these chapters lays a fascinating historical trail, illuminated at each turn by anecdotes which bring the characters to life as real human beings of every nature and habit, influenced by their peers and the times they inhabited, but so often ahead of them in their vision and invention (or discovery?). The stage is set for the final assault on the summit – is God indeed a mathematician? Here Livio has assembled an impressive collection of views on the existence (or not) of a mathematics independent of the human mind, quite startling in their variation, but leaving me sitting on the fence kindly provided by his suggestion that mathematics is partly created by us (concepts) and partly discovered (relations among those concepts). Judgment on God's role is left as an exercise for the reader, who might bear in mind that, even in the 17th century, Spinoza pondered "whether we say that God has eternally willed and decreed that the three angles of a triangle should be equal to two right angles, or that God has understood this fact".

Every serious mathematician should read this book. It clothes its erudition (the notes and bibliography alone are almost worth the price!) with humour and humanity, and encourages that deep contemplation of our subject that is so often threatened by the pressures of the modern world.

> John Brindley University of Leeds

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# **CALENDAR OF EVENTS**

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

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

#### **MARCH 2011**

4-5 North British Functional Analysis Seminar, Sheffield (401)

10-12 Big Bang Fair, ExCeL, London (401)
14-18 Representations of Surface Groups and Higgs Bundles Workshop, Oxford (398)
16 One-Day Meeting in Combinatorics,

Oxford (400)

**16-18** Analysis Workshop, Imperial College London (401)

#### 21-25 Compressed Sensing LMS Invited Lectures 2011, Cambridge (401)

**21-25** Asymptotic Properties of Solutions to Hyperbolic Equations Conference, Imperial College London (401)

24 IMA Mathematics 2011 Conference, London (400)

28-30 Frontiers of Nevanlinna Theory 1:
Overview, University College London (401)
28 - 1 Apr Discrete Harmonic Analysis
Workshop, INI, Cambridge (398)

**29** The Symmetric Group: Representations and Combinatorics, Royal Holloway, University of London (400)

#### **APRIL 2011**

**3-8** Topics in Probability, LMS–EPSRC Short Course, Oxford (400)

4-5 Nonlinear Waves and Solitons in Lattices Workshop, ICMS, Edinburgh (400)
4-8 Computational Challenges in Partial Differential Equations Meeting, Swansea (392) 6 Patterns, Nonlinear Dynamics and Applications (PANDA), Surrey (401) 10 An Introduction to Mathematical Neuroscience ICMS Training Workshop, Edinburgh (400) 11-13 BAMC 2011, Birmingham (398) 11-13 Mathematical Neuroscience ICMS Conference, Edinburgh (400) 11-14 Random Structures and Dynamics Workshop, Oxford (400) 11-15 Derived Categories Workshop, INI, Cambridge (399) 11-16 Groups, Combinatorics, Computing De Brún Workshop, Galway (398) 14-16 Young Researchers in Mathematics 2011 Conference, Warwick (398) 18-21 BMC 2011, Leicester (398)

**25-29** The Kervaire Invariant and Stable Homotopy Theory ICMS Workshop, Edinburgh (401)

#### **MAY 2011**

2 Multiple Zeta Values: Preparation Day, Bristol (401) 3-6 Multiple Zeta Values, Modular Forms and Elliptic Motives Workshop, Bristol (401) 5 LMS Spitalfields Day, INI, Cambridge 6 Women in Mathematics Day, London (401) 17 LMS–Gresham Lecture, London (401) 19 Good Practice Award Workshop, De Morgan House, London (401) 22-27 Progress on Difference Equations 2011, Dublin (398) 27-28 Panhellenic Geometry Conference, Rion, Greece (401) 30 - 3 Jun MEGA 2011, Stockholm, Sweden (400)31 - 3 Jun CHAOS 2011, Crete, Greece (400)

#### **JUNE 2011**

6-8 Nonlinear Diffusion: Algorithms, Analysis and Applications Workshop, Warwick (395)
6-10 Oscillatory Integrals in Harmonic Analysis ICMS Workshop, Edinburgh (398)

22



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#### No. 401 March 2011

7-10 14th Applied Stochastics Models and Data Analysis International Conference, Rome, Italy

13-17 Stabilization of Dynamical Systems and Processes ICMS Workshop, Edinburgh (398)
14 LMS Midlands Regional Meeting, Birmingham (401)

**15-18** Representation Theory Workshop, Birmingham (401)

**20-24** Geometric Analysis ICMS Workshop, Edinburgh (398)

22-24 First British Conference on Mathematics of Filtering and Its Applications, Brunel
26 - 2 Jul New Developments in Non-Commutative Algebra and Applications
ICMS Workshop, Sabhal Mòr Ostaig, Isle of Skye (398)

27-29 Frontiers of Nevanlinna Theory 2: p-adic Function Theory and Arithmetic Dynamics, University College London (401)
27 - 1 Jul Moduli Spaces Closing Conference, INI, Cambridge (401)

27 - 1 Jul Signal Pocessing with Adaptive Sparse Structured Representation, ICMS Workshop, Edinburgh (398)
29 LMS Popular Lecture, Institute of Education, London (401)

#### **JULY 2011**

1 LMS Meeting, London 4-8 Theories of Infinity ICMS–ESF Meeting,

Edinburgh (398) 4-8 Gauge Theory and Complex Geometry, Leeds

9-11 Quantum Cohomology, Symplectic Resolutions and Representation Theory Meeting, Oxford

**11-15** Numerical Relativity Beyond Astrophysics ICMS Workshop, Edinburgh (398) **18-20** Toric Methods in Homotopy Theory Conference, Belfast (398)

**18-22** Experiments for Processes with Time or Space Dynamics INI Workshop, Cambridge (400)

18-22 ICIAM 2011, Vancouver, Canada (400) 19 LMS Northern Regional Meeting, Leeds (401)

**19-22** Homogeneous Structures Workshop, Leeds (401)

**21-22** Twistors in Geometry and Physics Meeting, Oxford (401) **25-29** Introductory Workshop on Inverse

Problems, INI, Cambridge (400

29-31 IPMC 2011, Islamabad, Pakistan

#### **AUGUST 2011**

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1-5 EQUADIFF 2011, Loughborough (400)
1-5 Inverse Problems in Analysis and Geometry INI Workshop, Cambridge (400)
9-12 Optimum Design for Mixed Effects Non-Linear and Generalised Linear Models INI Workshop, Cambridge (399)

15-19 Design of Experiments in Healthcare
INI Workshop, Cambridge (400)
22-26 Analytic and Geometric Methods in
Medical Imaging INI Workshop, Cambridge

(400) **29 - 1 Sep** Algebra, Combinatorics, Dynamics and Applications, Queen's University,

Belfast

**30 - 2 Sep** Designed Experiments: Recent Advances in Methods and Applications INI Workshop, Cambridge (399)

#### **SEPTEMBER 2011**

5-9 European Women in Mathematics General Meeting, Barcelona (396)
5-9 Mathematical Imaging in Interaction with Biomedicine ICMS Workshop, Edinburgh (398)

**11-17** Turning Dreams into Reality ICME, South Africa (388)

**12-16** Networks: Stochastic Models for Populations and Epidemics ICMS Workshop, Edinburgh (398)

**19-23** Hyperbolic Conservation Laws and Related Analysis with Applications ICMS Workshop, Edinburgh (398)

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**JULY 2012** 

# H.M. TAYLOR LMS member 1866–1914



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Henry Martyn Taylor, JP, MA, FRS, FRAS, FCPS Barrister-at-law, Fellow and Tutor of Trinity College, Cambridge LMS Council 1875, 1878–80

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