

# THE LONDON MATHEMATICAL SOCIETY



## NEWSLETTER

No. 402 April 2011

### Society Meetings and Events

#### 2011

**Thursday 5 May**  
LMS Spitalfields Day  
INI, Cambridge

**Friday 6 May**  
Women in Mathematics  
Day, London [page 18]

**Tuesday 17 May**  
LMS–Gresham Lecture,  
London

**Tuesday 14 June**  
Midlands Regional  
Meeting, Birmingham  
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**Wednesday 29 June**  
LMS Popular Lecture,  
London [page 19]

**Friday 1 July**  
London

**Tuesday 19 July**  
Northern Regional  
Meeting, Leeds  
[page 9]

**Thursday  
29 September**  
LMS Popular Lecture,  
Birmingham [page 19]

### NEWSLETTER ONLINE:

Go to [www.lms.ac.uk/newsletter](http://www.lms.ac.uk/newsletter)

### LMS COUNCIL DIARY 11 February 2011

The President began the meeting by welcoming the new members of Council, Wilfrid Kendall, Marco Marletta and Colva Roney-Dougal. After the usual review of minutes and matters arising, including a review of the minutes of the Finance and General Purposes Committee held on 4 February, there were a few financial matters to discuss. One of these was the important matter of applying for new grants to support MARM (Mentoring African Research in Mathematics), which has been supported for the past five years by grants from the Nuffield Foundation and the Leverhulme Trust. The LMS and the IMU Commission on Developing Countries have each agreed to provide a small sum to pay a suitable person to prepare bids to various bodies for substantial grants to enable the scheme to continue, and preferably grow substantially. The next item on the agenda was supposedly to make formal decisions on some 'clear outcomes' from the Retreat which took place the previous week. However, it emerged that the outcomes were not all that clear, and much of the discussion took place again.

After a quick lunch, Susan Hezlet, the LMS Publisher, gave us a complete rundown of the Society's publishing activities, partly as induction for new members of Council, but also as a useful reminder for the rest of us. The most substantial item on the Council agenda was on external relations and policy. I think it is fair to say that this covers a number of areas of great current concern to LMS members. First, we discussed the report of the EPSRC International Review of Mathematics. While there was general support for the overall tone and recommendations of the report, it was felt that EPSRC was likely to ignore most of the really important recommendations, as they fly in the face of current EPSRC policy. The Research Policy Committee will doubtless keep the situation under review, and draft appropriate responses when necessary.

Next we discussed the draft LMS response to the Government's White Paper *The Importance of Teaching*. We were all urged to think about this and feed in suggestions. Then there were reports from the CMS (Council for the Mathematical Sciences), in particular its meeting with HEFCE on 'impact'. While the impact of 'impact' in the Research Excellence Framework (REF) has

been reduced from 25% to 20%, we regarded the situation as still 'depressing'. How can a system designed to reward a department for work done perhaps 25 years earlier by people long since retired be regarded as progressive? And how can anyone believe that it is sensible to change current behaviour based on such a system?

Finally, after some internal matters were rapidly disposed of, under any other business Ari Laptev brought up the possibility of the 2016 European Congress of Mathematics being held in the UK. It was agreed, however, that the first requirement was to find someone who wanted to organise it, who could then approach the LMS for appropriate support. Anyone interested?

Robert Wilson

## LMS COUNCIL AWAYDAY

4–5 February 2011

On 4–5 February, Council met informally in London to discuss such matters of policy and strategy as cannot be adequately explored in the regular formal meetings. Although we could not legally take any decisions, on most matters we came to a consensus as to the best way forward. We began on Friday afternoon with a session on policy and consultation. With the model of the three research policy documents recently produced for the EPSRC International Review of Mathematics very much in mind, we agreed that we should over time produce similar policy documents covering other areas of concern to us, especially, of course, higher education. These documents would be produced in consultation

## LMS Newsletter

[www.lms.ac.uk/newsletter](http://www.lms.ac.uk/newsletter)

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Typeset by the London Mathematical Society at De Morgan House; printed by Holbrooks Printers Ltd.

**Publication dates and deadlines:** published monthly, except August. Items and advertisements by the first day of the month prior to publication, or the closest preceding working day.

**Advertising:** for rates and guidelines, see [www.lms.ac.uk/newsletter/ratecard.html](http://www.lms.ac.uk/newsletter/ratecard.html)

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Charity registration number: 252660.

with members, regularly reviewed, and used as appropriate in response to consultations and enquiries from Government and other bodies.

This led on to a wide-ranging discussion of the role of the LMS, its relationships to other organisations, and what we can do to help the mathematical sciences community rise to the undoubted challenges we currently face. We re-affirmed the role of the CMS in facilitating the LMS making common cause with the IMA and the RSS where this is possible, while firmly asserting our right to make independent statements whenever we want. While relations with EPSRC continue to deteriorate, we were heartened by news of developing high-level contacts with Government. The simplistic view of some in Government that mathematics and English are all that matter in schools may yet be turned to our advantage.

The next topic to be discussed was membership, firstly the question of how to make membership of the LMS more attractive. The membership survey produced a number of interesting suggestions which will be followed up. However, we are severely constrained by charity law, which means that (broadly speaking) tangible benefits must be paid for from subscriptions. Thus our only real option is to emphasise, and improve, the intangible benefits. One clear message from the membership survey was that we do not advertise or market ourselves adequately. A significant number of suggestions for LMS activities came from people who are evidently unaware that we already do the things they suggested. It is also clear to us that people will only join the LMS if they see it as relevant to them. To this end we are keen to involve more people, particularly those at the start of their careers, in running LMS activities. An active system of departmental representatives has also been suggested.

After 'debriefing' over dinner and drinks, we resumed on Saturday morning with discussions on opening up membership more

broadly, and on simplifying the applications procedure. The latter is specified quite precisely in the Royal Charter and Statutes, so cannot realistically be changed in the short term. Instead, we agreed to consider at a future Council meeting proposals for reduced subscriptions for certain categories of members. There was some sympathy for the idea of broadening the membership in various ways, but only if this could be achieved without losing our focus on research and university-level mathematics. It is noticeable, for example, that while at least one-third of LMS grants go to areas outside pure mathematics (including, besides traditional applied mathematics, also theoretical computer science and mathematical and theoretical physics), a much smaller proportion of LMS members are from this constituency.

The penultimate session could have been contentious, but turned out to be a bit of light relief. In view of comments from the membership survey, that the name 'London Mathematical Society' sounded parochial, we were invited to consider the possibility of changing it. But no-one spoke in favour of this idea, and it was rapidly kicked into touch.

The final session after lunch was devoted to matters of education policy and other work of the Education Committee, in particular promotion of mathematics to the wider public. One issue is where to draw the boundaries of the Education Committee's role, particularly in school education. Another is how to disentangle its work on policy from the practical work of organising events, distributing grants, and so on. At least on the latter question we were able to make progress: the suggestion was made to start the next meeting of the Committee earlier, in order to allow an hour or two to be devoted specifically to policy issues. But after ten hours of talking, we were all getting tired, and it was time for the President to bring the proceedings to a close.

Robert Wilson

UNIVERSITY OF CAMBRIDGE

FACULTY OF MATHEMATICS

ADAMS PRIZE

Computational Mathematics

The University of Cambridge has announced the subject for one of its oldest and most prestigious prizes. The Adams Prize is named after the mathematician John Couch Adams and was endowed by members of St John's College. It commemorates Adams's discovery of the planet Neptune, through calculation of the discrepancies in the orbit of Uranus.

The Chairman of the Adjudicators for the Adams Prize invites applications for the 2011-12 Prize which will be awarded this year for achievements in research on Computational Mathematics.

The prize is open to any person who, on 31<sup>st</sup> October 2011, 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 £14,000, 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.

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:

**The Secretary of the Adams Prize Adjudicators,  
Faculty Office, Centre for Mathematical Sciences,  
Wilberforce Road, Cambridge, CB3 0WA**

*(email: [faculty-office@maths.cam.ac.uk](mailto:faculty-office@maths.cam.ac.uk))*

**The deadline for receipt of applications is 31 October 2011.**



## LMS GRANT SCHEMES

**Next Closing Date for Applications: 15 May 2011**

Applications are invited for the following grants:

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

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

- Applications received by **15 May 2011** will be considered at a meeting in June.
- Applications should be submitted well in advance of the date of the event for which funding is requested.
- Normally grants are not made for events which have already happened or where insufficient time has been allowed for processing of the application.

Queries regarding applications can be addressed to the Grants Administrators or the Programme Secretary (see below) who will be pleased to discuss proposals informally with potential applicants and give advice on the submission of an application.

- Grants Administrators: Sylvia Daly and Elizabeth Fisher (tel: 020 7291 9971/3, email: [grants@lms.ac.uk](mailto:grants@lms.ac.uk)) who both work Wednesday–Friday.
- Programme Secretary: Stephen Huggett (tel: 01752 586869, email: [s.huggett@plymouth.ac.uk](mailto:s.huggett@plymouth.ac.uk)).

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/content/grants](http://www.lms.ac.uk/content/grants).

### Other Grants News

We would like to draw your attention to the following.

#### Childcare Grants

The Society believes that all parents working in mathematics should be able to attend conferences and research meetings without being hindered by childcare costs. Institutions are expected to make provision for childcare costs and parents are encouraged to make enquiries. However, where this is not available, the Society administers a Childcare Supplementary Grants Scheme. Further details can be found on the LMS website: [www.lms.ac.uk/content/childcare-supplementary-grants](http://www.lms.ac.uk/content/childcare-supplementary-grants).

#### Conference Grants to Celebrate New Appointments

To be eligible for a grant, the inaugural meeting must take place within two years of the start date of the new appointment. Please note that this policy may be subject to change and will be reviewed later in the current academic year. Any changes will be published on the website. Please note that applications are made via Scheme 1.

#### Joint Research Groups Supported by the LMS

Details of forthcoming meetings to be held by these groups are normally included in the Calendar of Events section of the LMS website.

#### Membership Information Packs

As part of a new initiative, the Society will be asking the organisers of LMS-sponsored conferences and joint Research Groups to encourage participants at their meetings to join the Society. Membership packs, which include information about the LMS, and application forms, will be sent to the organisers.

## LONDON MATHEMATICAL SOCIETY MIDLANDS REGIONAL MEETING

**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](mailto:goodwin@maths.bham.ac.uk)). The cost of the dinner will be approximately £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/lms2011/> 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.

## 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). Nominations should be received by **Friday 27 May 2011** in order to be considered by the Nominating Committee.

Direct nominations, together with standard biographies, should be sent to the Executive Secretary's office (nominations@lms.ac.uk) to arrive before **noon on 1 September 2011**. 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 nominations will be posted as they are received.

## ALAN JEFFREY

Professor Alan Jeffrey, who was elected a member of the London Mathematical Society on 12 October 1979, died on 6 June 2010, aged 80.

*Robert Gilbert writes:* Alan, who received his PhD and DSc degrees in mathematics from the University of London, was the first holder of the Chair of Engineering Mathematics at the University of Newcastle-upon-Tyne, to which he was appointed in 1965. He had begun his research career in industry, with the General Electric Company, and then with Rolls Royce, where he became their senior research mathematician. During this period he became involved with research into control theory, electromagnetic theory, neutron transport theory, gas dynamics, magnetohydrodynamics and partial differential equations. He co-authored with Tosiya Taniuti in 1964 one of the first books devoted to nonlinear wave propagation.

Shortly after joining the University of Newcastle-upon-Tyne, he became one of the organizers of the North British Differential Equations Year. To enable the interest generated during this year to be sustained, he joined with a member from each participating university to found the North British Differential Equations Seminar.

He lectured extensively throughout Europe, North America, China, Japan and the USSR. In 1967 he was elected to Fellowship of the Institute of Mathematics and its Applications, and in 1972 to Fellowship of the Royal Society of Edinburgh.

In 1975 he became the founding editor of the Pitman Advanced Publishing Program. As a result the Research Note Series and the companion Monographs and Surveys Series came into being. His involvement with mathematical research also extended to the editorship of research journals. His last book *Matrix Operations for Engineers and Scientists* was finished just before his death and was published in late 2010.

Alan Jeffrey was a devoted family man, with a keen interest in his two granddaughters. He lost his wife of 53 years, Lisl, in 2005.

## IAN R. PORTEOUS

Ian Porteous, who was elected a member of the London Mathematical Society on 17 December 1959, died on 30 January 2011, aged 80.

*Peter Giblin writes:* Ian is remembered not only for his academic work but, especially in recent years, for the unflagging commitment he brought to the enrichment of school mathematics through such initiatives as the FunMaths Roadshow ([www.funmathsroadshow.com](http://www.funmathsroadshow.com)).

Following a PhD in algebraic geometry (Chern classes) with Michael Atiyah at Cambridge, Ian moved to Liverpool University in 1959. Apart from a year 1961–2 at Columbia University, where he was greatly influenced by the teaching and seminar activity of Serge Lang, Ian spent his whole career at Liverpool, as lecturer and from 1972 as senior lecturer, retiring in 1998. His research interests moved from algebraic geometry through Thom polynomials to the newly flourishing area of singularity theory, particularly exploiting the wonderful new ideas of René Thom in applying singularities of functions and mappings to understanding in exquisite detail the geometry of smooth surfaces and higher-dimensional manifolds. The legendary ‘Liverpool Symposium’ on Singularity Theory of 1969–70 was a springboard for his as well as other mathematical careers. Ian published many of his ideas in this area in the book *Geometric Differentiation: for the intelligence of curves and surfaces* (1994 and 2001), and as recently as 2007 (aged 78) he was on the jury of a French PhD thesis on computational geometry and the extraction of ridge curves from real-world data. Ian also published a standard work (1995) on Clifford Algebras and, earlier, wrote up the fruits of his year at Columbia in *Topological Geometry* (1969). He was an accomplished translator of books and articles from the Russian.

Ian’s work with schools started in earnest during his time as a Liverpool City Councillor in the 1970s. He and James Taylor established Mathematical Education on Merseyside (MEM), running Challenge competitions sponsored by local industry and commerce, and, from 1991, Masterclasses on the Royal Institution pattern. MEM became a charity in 1986 and still flourishes. Ian was its President from 1983 until his death.

The FunMaths Roadshow started as a celebration of the centenary of the Liverpool Mathematical Society in 1999, when a grant from Girobank enabled the production of the first ‘boxes’ of activities. Today the Roadshow has 350 activities divided into 14 boxes spanning the whole school range and is available in English, French, Portuguese, Welsh, Gaelic and Mandarin. It has attracted substantial funding from EPSRC and is supported by an Outreach Team largely recruited and inspired by Ian’s enthusiasm and commitment. He continued to visit schools until very recently.

Ian died the day after giving a presentation to keen youngsters at the Liverpool University Maths Club, which he helped to found in 1999.

## KAORU WAKANA

Kaoru Wakana, who was elected a member of the London Mathematical Society on 17 November 1966, died on 26 June 2010, aged 88.

*Mineo Wakana writes:* Kaoru Wakana was born in Japan in 1921. His parents were poor, and he was brought up by his grandparents. He worked hard at mathematics and entered Tokyo Imperial University. For that reason he did not serve in World War II, in which many of his friends were killed. He became a high-school mathematics teacher. He visited London in September 1969, and met members of the London Mathematical Society. He enjoyed mountain walking in his youth, and loved roses and the camellias: he loved mathematics all his life.

## **LONDON MATHEMATICAL SOCIETY**

### **NORTHERN REGIONAL MEETING**

**Tuesday 19 July 2011**

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

**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](http://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.



**Department of Mathematical Sciences**

<http://www.durham.ac.uk/mathematical.sciences>

**Lecturer in Pure Mathematics**

**Closing date:** 26 April 2011

**Web link:** [http://ig5.i-grasp.com/fe/tpI\\_durham01.asp?newms=jj&id=67069](http://ig5.i-grasp.com/fe/tpI_durham01.asp?newms=jj&id=67069)

The successful candidate will have an excellent research record in an area of Pure Mathematics. Preference may be given to candidates whose research areas are compatible with existing interests of the Pure Mathematics unit. The post-holder will be expected to undertake and publish original research of the highest level, to contribute to the research activities of the Pure Mathematics research unit and of the department as a whole, and to undertake teaching and administrative duties as assigned by the Head of Department of Mathematical Sciences.

Applications from holders of personal fellowships would be welcome.

For appointment at Grade 8 candidates will need to provide evidence of relevant teaching experience at University level and a significant record of publications at international level.

**Contact details:**

Professor John Parker

Telephone: 0191 334 3057

Email: [j.r.parker@durham.ac.uk](mailto:j.r.parker@durham.ac.uk)

Professor Paul Mansfield

Telephone: 0191 3343104

Email: [p.r.w.mansfield@durham.ac.uk](mailto:p.r.w.mansfield@durham.ac.uk)

## INTERNATIONAL REVIEW OF THE MATHEMATICAL SCIENCES

### Report on Town Meeting

The EPSRC Town Meeting to present the draft report of the Review Panel took place in the Senate House of the University of London on the afternoon of 28 January 2011, before an expectant crowd of more than a hundred members of the mathematical science community, staff of EPSRC, and even the occasional journalist. After brief introductory speeches by Professor Adrian Smith (Director General, Knowledge and Innovation) and Professor Tim Pedley (Chair of the IRM Steering Committee), the Chair of the Review Panel, Professor Margaret Wright of New York University, gave a *tour de force* presentation, outlining in 50 minutes the key findings and recommendations of the Review.

From an LMS perspective, the most striking of these were:

- F-1. Overall, mathematical sciences research in the UK is excellent on an international scale, with world-leading researchers in every subfield and closely connected application area considered by the panel.

- F-2. The high quality of UK mathematical sciences research depends critically on the diverse and distributed research community, where 'diverse' includes research area, group size and institution size, and 'distributed' refers to geographical location.

- F-6. Despite improvements, most UK-educated PhDs in the mathematical sciences are not adequately trained to be competitive on the international academic job market; hence a large proportion of postdocs and junior faculty consists of researchers trained outside the UK.

- F-7. Action about gender diversity is not a sufficiently high priority for the UK mathematical sciences research community.

- R-1. To research funders: The panel strongly recommends that diversity and distributedness of the UK mathematical sciences (Finding F-2, above) should be enhanced by providing a variety of funding programmes designed so that the best mathematical sciences researchers can advance their activities in research and graduate education. To provide maximal support for top-quality researchers in this context, it is highly desirable to have flexible funding models that permit geographically distributed researchers working in a broad scientific area to receive adequate long-term funding.

- R-2. To research funders, learned societies and the mathematical sciences community: Open, frank and timely communication between EPSRC and the mathematical sciences community is extremely important. In addition to strengthening existing processes, the panel strongly recommends the establishment, as soon as possible, of a new structure for communication between EPSRC and the mathematical sciences community. A joint effort between EPSRC and leadership of the learned societies is an obvious way to begin to define such a structure.

- R-5. To universities, funders of PhD research and the mathematical sciences community: To complement existing EPSRC programmes that support PhD education (such as Taught Course Centres and Centres for Doctoral Training), UK universities should consider establishing, as a norm, a PhD programme that begins with a special one-year research Master's degree, followed by three years of PhD education and training.

Margaret Wright singled out (R-1) and (R-2) as being the most important of the Panel's recommendations, and indeed (R-2) is described as "an *essential recommendation*" in Section 12.

After Margaret Wright's presentation, Tim chaired a long and lively discussion involving many contributions from the floor, with responses from Margaret and (occasionally) from David Delpy (Chief Executive of EPSRC).

(continued on the next page)



The formal proceedings were brought to an end by a short speech from David Delpy. The final version of the IRM Report will be published as soon as any minor factual errors in the draft have been corrected. Meanwhile, the draft report can be accessed via the EPSRC website at [www.epsrc.ac.uk](http://www.epsrc.ac.uk). Arrangements are in train for a high-level meeting between EPSRC and the Council for the Mathematical Sciences, to discuss how the recommendations of the report can begin to be implemented.

Ken Brown  
LMS Vice-President

## MATHEMATICS JOURNALS WORKSHOP

### Report

12

This workshop, organised by Jim Crowley (SIAM), Susan Hezlet (LMS), Robion Kirby (Berkeley) and Don McClure (AMS), brought together publishers, librarians, editors, and researchers at the the Mathematical Sciences Research Institute (MSRI) in Berkeley, USA, to exchange ideas about the challenges and opportunities faced by mathematical journals. The LMS was represented by Susan Hezlet, Angus Macintyre, and me.

The conference, held on 14–16 February, was timely for several reasons, including open-access mandates for government-funded research outputs, recent updates to the IMU code of best practice, budget pressures on research libraries, and the growth in new mechanisms for publishing outside the world of commercial publishers and learned societies. Some themes that emerged in the discussions included: ‘How will open access mandates impact on the business models of publishers and learned society publishers?’, ‘How can we ensure the long-term security and accessibility of the older literature?’, ‘Can we move to new, cheaper, business models while maintaining the quality of peer review, typesetting, copy-editing; funding innovative delivery platforms, and ensuring

long-term security of the material?’, ‘How can the arXiv be maintained in the long term?’, ‘How can the specific concerns of mathematical publishing – its extraordinary longevity for example – be protected when mathematics is such a small part of academic publishing?’

A particular concern for the LMS is to maintain the ability to generate revenues through publishing that can continue to support mathematical life via small grants. These small grant schemes will if anything grow in relative importance as other funding streams either dry up completely or move to fewer, larger, grants.

There were a large number of short presentations, and it was fascinating to be able to engage directly with diverse perspectives – and to have speakers involved in the key interfaces between learned societies and policy-makers.

The fact that MSRI was fogged in for much of the meeting did not dampen the discussion, nor cloud the clarity with which the key divisions emerged. Highlights included:

1. The complex issue of huge per-page price disparities, including the question of full production costs as opposed to marginal costs for a journal hosted in a friendly mathematics department, and the cost-quality equation for full-text copy editing.
2. Impassioned advocacy for a model pursued by the Institute of Mathematical Statistics: a core set of journals in a traditional subscription model, with a fringe of cheaper electronic journals, and all accepted papers on the arXiv.
3. The *Annals*’ experiment with full open access, which they found to be non-viable.
4. Mathematics is one of the slowest disciplines to adapt to electronic publishing.
5. Shared suspicion about the reliability of impact factors, and anxiety about an ‘author pays’ model.

Some of the talks will become available on the MSRI website ([www.msri.org](http://www.msri.org)), and I urge LMS members to get involved in the discussion about the future of mathematical journals.

Tom Ward  
University of East Anglia



# Journals of the London Mathematical Society

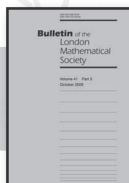


## Journal of Topology

[www.jtopol.oxfordjournals.org](http://www.jtopol.oxfordjournals.org)

## Journal of the London Mathematical Society

[www.jlms.oxfordjournals.org](http://www.jlms.oxfordjournals.org)



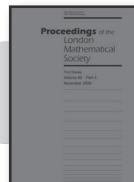
## Bulletin of the London Mathematical Society

[www.blms.oxfordjournals.org](http://www.blms.oxfordjournals.org)



## Proceedings of the London Mathematical Society

[www.plms.oxfordjournals.org](http://www.plms.oxfordjournals.org)



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## MATHEMATICS POLICY ROUND UP

### **International Review of Mathematical Sciences: Vice-President's Report**

The International Review of Mathematical Sciences (IRM) took place in December 2010. The review was organised by EPSRC to provide 'an independent assessment of the quality and impact of UK mathematical sciences research'.

The draft report of the IRM review panel was presented at the EPSRC Town Meeting on 28 January 2011. The Town Meeting was attended by several LMS representatives, and LMS Vice-President Professor Ken Brown has written a short report on the meeting outlining the major points of interest from an LMS perspective.

Professor Brown's report can be found on page 11 of this *Newsletter*.

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### **Research Excellence Framework (REF) panel members announced**

The REF team on behalf of the four UK funding bodies has announced the membership of the expert panels for the REF 2014. Subject associations and other organisations with an interest in research in UK higher education institutions were invited to nominate candidates. Further members are still to be appointed to a small number of panels and an updated membership list will be published in due course.

For more information on the expert panels visit [www.hefce.ac.uk/research/ref/panels](http://www.hefce.ac.uk/research/ref/panels). The Mathematical Sciences sub-panel is listed under Main Panel B and is chaired by Professor John Toland (University of Bath), an ex-President of the LMS.

### **The future of higher education**

The Business, Innovation and Skills Committee announced in February an inquiry into the future of higher education. The enquiry closed on 10 March. Terms of reference are:

- the conclusions of the Browne Report and the content of the government's proposed White Paper on higher education (including the government's proposals for widening participation and access); and

- the role and future of state funding in higher education.

More information is available on the webpage <http://tinyurl.com/6gyhkf9>.

### **Access to higher education**

Universities wanting to charge over £6,000 for their courses from 2012 will have to work much harder to recruit students from disadvantaged backgrounds under new guidelines. In a final Guidance Letter sent to the Office of Fair Access (OFFA) ([www.bis.gov.uk/he-access-agreements](http://www.bis.gov.uk/he-access-agreements)) Ministers asked its Director to be more challenging and demanding of universities seeking to charge higher fees.

The government also announced details of the national scholarship programme that will provide students from disadvantaged backgrounds with help towards the cost of attending university. Around 50,000 students a year could be awarded a scholarship from 2014. Scholarships will be worth at least £3,000 for individual students in tuition discounts and other benefits.

The Director of Fair Access commented on the new letter of guidance from ministers. The comments are available at <http://tinyurl.com/68jasjq>.

### **Royal Society calls for fundamental reform of the A-level system**

The Royal Society called for fundamental reform of the A-level system leading to the introduction of an A-level based Baccalaureate or similar qualification, in a new report published in February 2011. The new qualification should give students the opportunity to study a greater breadth of subjects, including science and mathematics.

The report found that the current educational system for 16–19 year old students results in only a small proportion of students studying science and mathematics subjects at A-level or equivalent in the UK. As a consequence, too few individuals are able to progress to university STEM (science, technology, engineering and

mathematics) degrees. This leads to a deficit of STEM graduates available to enter employment in commerce and industry and teaching as specialist science and mathematics teachers. The Royal Society recommends that the A-level system in England must be reformed to encourage more students to continue with science and mathematics as part of a wider range and increased number of subjects at post-16 level.

The full report and a summary are available at <http://royalsociety.org/Education-Policy/Projects>.

### The English Baccalaureate

The Education Committee announced in February a new inquiry and call for evidence into the English Baccalaureate. The inquiry closed on 10 March 2011. Written submissions were invited, addressing the following points:

- the purpose and benefits of the E-Bac and its value as a measure of student and school performance;
- the choice of subjects included in the E-Bac;
- the implications of the E-Bac for students, schools and employers; and
- international comparators for the E-Bac.

### Recent speeches by government ministers

In February the Minister for Schools, Nick Gibb, gave a speech to the 100 Group – which represents the Finance Directors of the UK's largest companies – about standards in English schools as set against international levels of achievement. The full text of the speech is available at <http://tinyurl.com/64d4szb>.

### Technology and Innovation Centres report

The Science and Technology Committee has published a report on *Technology and Innovation Centres* (TICs) in which it welcomes the government's £200 million commitment for an elite network of centres but warns that the money should not be spread too thinly. An initial target of six to eight centres across the UK seems to be sensible, with a view to widening the network of centres in the future. A copy of the full report is available at <http://tinyurl.com/5svofkp>.

### Tier 2 migrant regulations

New details of the government's changes to the work visa route have been announced by the Home Office. Details are available at <http://tinyurl.com/4gpoxjx>. There are several key points in the proposal.

- Although the overall limit is 20,700, Tier 2 is now only open to graduate-level applicants, which removes much of the non-graduate competition for scientists and engineers.
- Any applicants for a job on the official shortage occupations (SO) list (see <http://bit.ly/e2JjM8>) are given vastly preferential treatment – the equivalent of earning over £150,000. Many of the shortage occupations are in science and engineering.
- Any applicants for a PhD (or equivalent) level position not on the SO list are also given preferential treatment: PhD-level applicants earning £23,000 would be admitted before non-PhD-level applicants earning £74,000.

There is more information on the UK Border Agency's statement of intent at <http://tinyurl.com/6jtyfa4>.

Dr John Johnston  
Mathematics Promotion Unit

## YOUNG FUNCTIONAL ANALYSTS' WORKSHOP

The third annual *Young Functional Analysts' Workshop* will take place at the University of York from 6 to 8 April 2011. This is a forum for postgraduate students and other analysts at the beginning of their careers. Attendees will be expected to give a talk or poster presentation to their peers. Invited speakers include:

- Simon Eveson (York)
- Stephen Power (Lancaster)

This year there will be limited funding available for transport and accommodation for UK-based participants, since the event is being funded by an LMS Scheme 8 grant. For more information visit the website at <http://sites.google.com/site/yfawuk> or contact the organiser Tom Potts ([tjp502@york.ac.uk](mailto:tjp502@york.ac.uk)).

## MATHEMATICAL SCIENCES HE CURRICULUM INNOVATION

### Upcoming workshops

My role in the Mathematical Sciences Strand of the National HE STEM Programme includes offering workshops to develop teaching of mathematical sciences by allowing those doing interesting work to share their approach with those looking to take up new ideas in their own teaching. I am keen to run workshops on approaches to tackling key issues in HE mathematical sciences or that examine innovative but as yet small-scale practice, particularly where a few individuals have had some success and are ready to share their approaches. It is important that the workshops are actually useful (not merely interesting or enjoyable) for attendees. Each workshop is designed with a balance between learning what others have done and being provided with tools and resources to get started. There are currently three workshops planned for next term.

#### Teaching students to write mathematics

12 May 2011, University of Leeds

Lead: Dr Kevin Houston.

Teaching students to write in a more orderly and logical way has numerous advantages: it makes marking easier; allows students to demonstrate their understanding (or not); forces an improvement in their thinking skills. Expressing ideas clearly and correctly is a valuable skill for graduates in further study, employment and life in general. At this workshop Dr Houston, Dr Mike Robinson (Sheffield Hallam) and Prof. Franco Vivaldi (Queen Mary) will share practical ways in which they have addressed this in their teaching.

#### Providing a mathematics and statistics support service using *Elluminate* (a virtual teaching and learning environment)

30 June 2011, Loughborough University

Lead: Dr Alun Owen.

We are funding a project led by Dr Owen which is piloting an online statistics support

service using *Elluminate*. At this workshop, run in collaboration with sigma, Dr Owen, Dr Sally Barton (Nottingham) and Dr Tim Lowe (Open University) will share their experiences of using *Elluminate* for one-on-one and small- group tutoring in mathematics and statistics and will offer training sessions on *Elluminate* and its basic functions. Participants are encouraged to bring their own laptops for this training where possible so that they return home set up and ready to use *Elluminate*.

#### Developing mathematical thinking through problems, puzzles and games

1 July 2011, University of Greenwich

Lead: Noel-Ann Bradshaw.

We are funding a project led by Noel-Ann Bradshaw expanding successful use of puzzles and games to develop mathematical thinking. This workshop will explore the ways that mathematics problems, puzzles and games are being used to enrich the undergraduate curriculum and engage students by developing problem solving and strategic thinking skills. Speakers will share their experiences in lectures, for maths support and in extra-curricular activities and offer resources to take away and use. Confirmed speakers so far are Noel-Ann Bradshaw, Dr Chris Sangwin (Birmingham) and Katie Steckles (Maths busker and Manchester MathsJam organiser).

To register for these workshops email Janet Nuttall ([j.nuttall@bham.ac.uk](mailto:j.nuttall@bham.ac.uk)). Details of these and further workshops are available via [www.mathstore.ac.uk/hestem](http://www.mathstore.ac.uk/hestem). If you have an idea for a workshop please contact me ([p.rowlett@bham.ac.uk](mailto:p.rowlett@bham.ac.uk)).

Peter Rowlett  
HE Curriculum Innovation Advisor,  
MSOR Network  
University of Birmingham

## MATHEMATICS AT THE EDINBURGH INTERNATIONAL SCIENCE FESTIVAL

The Edinburgh International Science Festival (9–22 April 2011) will feature three mathematics events:

1. *Winning Ways* (for children). How the mathematics of games can give you winning strategies for life. National Museum of Scotland, Chambers Street, from 13 to 17 April.
2. *The Mathematics of Holes*. Robert Ghrist (Pennsylvania) will explore topology and its applications. ICMS, 15 South College Street, 7 pm on 12 April.
3. *Counting Dots*. Keith Ball (UCL and ICMS) will describe how dots measure the area of shapes. ICMS, 15 South College Street, 7 pm on 14 April.

For further information consult the website at [www.sciencefestival.co.uk](http://www.sciencefestival.co.uk).

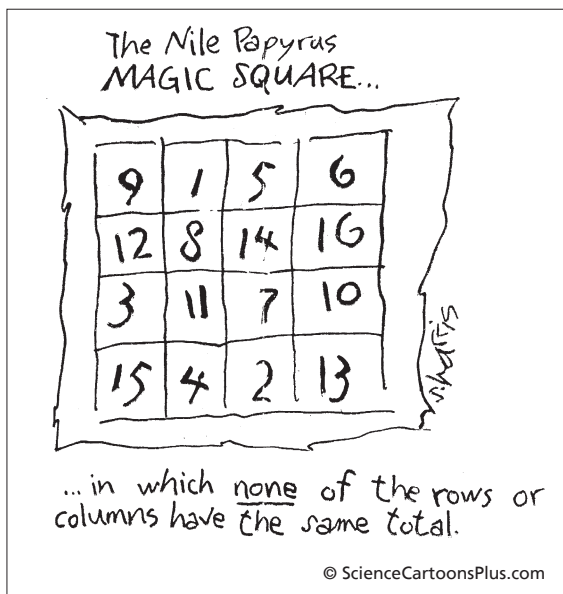
## WALES MATHEMATICS COLLOQUIUM 2011

The Wales Mathematics Colloquium is a forum for the promotion and discussion of current research in Mathematics in Wales. The meeting will be held at Gregynog Hall, Tregynon, near Newtown, Powys, beginning with tea at 4 pm on 23 May and finishing after lunch on 25 May 2011. Invited speakers, who will each give two talks, are:

- Caroline Series (Warwick)  
*Limits of limit sets*
- Jonathan Keating (Bristol)  
*Random matrices and number theory*
- Gui-Qiang G. Chen (Oxford)  
TBA

There will be other talks covering a wide range of topics in Pure and Applied Mathematics.

The meeting is organised by Mathematics Departments of universities in Wales in conjunction with the Wales Institute of Mathematical and Computational Sciences, and most participants will be staff or research students from those universities. Any others who would like to attend will be very welcome. The registration fee is £210, to include all meals and accommodation. The colloquium is supported by an LMS Conference grant and the Gregynog Fund. Please note that the organisers are unable to give financial support to outside participants. Owing to limited accommodation, places will be allocated on a first-come, first-served basis. If you are interested, contact E.J. Beggs ([E.J.Beggs@swansea.ac.uk](mailto:E.J.Beggs@swansea.ac.uk)) or S. Williamson ([administrator@wimcs.ac.uk](mailto:administrator@wimcs.ac.uk)) or visit the website [www.wimcs.ac.uk/gregynog.html](http://www.wimcs.ac.uk/gregynog.html) for an application form.



## WOMEN IN MATHEMATICS DAY 2011

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](mailto: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)

**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

**16.00–16.30** Tea

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](mailto: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](mailto:womeninmaths@lms.ac.uk)). The day is free for students and £5 for all others – payable on the day.



2008 Poster Competition Winner:  
Helena Mihaljevic-Brandt, Liverpool

## LONDON MATHEMATICAL SOCIETY

# POPULAR LECTURES 2011

Institute of Education, London – Wednesday 29 June

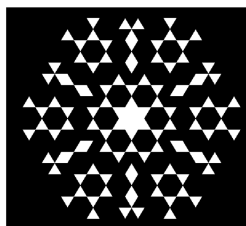
University of Birmingham – Thursday 29 September

### Dr Colva Roney-Dougall

St Andrew's University

#### ***Symmetry, Chance & Determinism***

By playing some games with symmetries, we'll discover the surprising fact that choosing randomly can give the same answer (almost) every time!



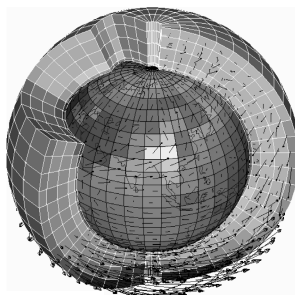
### Dr Hilary Weller

University of Reading

#### ***How Climate Models Work and Could They Be Better?***

Hilary Weller will describe some of the physics behind how the real climate works, some of the mathematics involved in creating a computer model of the climate to make climate predictions and how climate data is gathered in order to test the models.

We will see that, although climate models are far from perfect, some predictions can be made with confidence.



L. Fairhead (LMD-CNRS)

**LONDON:** Commences at 7.00 pm, refreshments at 8.00 pm, ends at 9.30 pm. Admission is free, with ticket. **Register by Friday 24 June.**

**BIRMINGHAM:** Commences at 6.30 pm, refreshments at 7.30 pm, ends at 9.00 pm. Admission is free, with ticket. **Register by Friday 23 September.**

To register for tickets, please email Lee-Anne Parker (leeanne.parker@lms.ac.uk) or visit the LMS website for a registration form ([www.lms.ac.uk](http://www.lms.ac.uk)).

The lectures are intended to be suitable for a general audience and no specific mathematical knowledge will be assumed. Although the talks are not primarily intended for professional mathematicians, everyone is welcome and some members may wish to apply for tickets for friends and relatives.



## GOOGLE GIFT TO THE INTERNATIONAL MATHEMATICAL OLYMPIAD

The International Mathematical Olympiad (IMO) is the world championship of secondary school mathematics. It is held each July at a site which moves around the globe. In 2010 it was held in Kazakhstan, and in 2011 it will be held in Amsterdam.

The responsibility for funding an IMO rests on the host country which has volunteered for the task. Happily, that job has just become a little easier. The internet company Google has made a gift of €1,000,000 to the IMO, the only condition being that the money be used to support the next five IMOs. Hitherto all IMO support and sponsorship has been on a one-off basis, so an IMO Foundation has been established to administer this gift, and any other future gifts.

In this country, participation in the IMO is organized by the UKMT (United Kingdom Mathematics Trust). UKMT also administers our national mathematics competitions in secondary schools. On 8 March, the 100th International Women's Day, UKMT and Murray Edwards College, Cambridge (formerly New Hall) announced the establishment of a European Girls' Mathematical Olympiad, the inaugural competition to be held in MEC in April 2012.

Geoff Smith  
Member,  
IMO Advisory Board

## OLGA TAUSSKY-TODD LECTURE

Dr Beatrice Pelloni (University of Reading) has been selected to give the Olga Taussky-Todd Lecture at the *International Congress of Industrial and Applied Mathematics* (ICIAM 2011) on Tuesday 19 July 2011. The Olga Taussky-Todd Lecture is one of the invited lectures at the Congress, which is the pre-eminent international meeting of applied and industrial mathematicians, held every four years. This honour is conferred on a 'woman who has made outstanding contributions in applied mathematics and/or scientific computation'. The lecture is named in tribute to the memory of Olga Taussky-Todd, whose scientific legacy is in both theoretical and applied mathematics, and whose work exemplifies the qualities to be recognized.

ICIAM 2011 will take place in Vancouver from 18 to 20 July 2011. For further information about the Congress visit the website at [www.iciam2011.com](http://www.iciam2011.com).



Amsterdam press launch of the Google gift. *Left to right:* Peter Barron (Google), Robbert Dijkgraaf (Royal Netherlands Academy of Arts and Sciences, Chair of the IMO 2011 Foundation), Geoff Smith (University of Bath and elected member of the IMO Advisory Board)



## ISAAC NEWTON INSTITUTE FOR MATHEMATICAL SCIENCES

**ACCELERATING INDUSTRIAL PRODUCTIVITY VIA  
DETERMINISTIC COMPUTER EXPERIMENTS AND STOCHASTIC  
SIMULATION EXPERIMENTS****5–9 September 2011**

in association with the Newton Institute programme entitled  
*Design and Analysis of Experiments*  
(18 July – 21 December 2011)

**Organisers:** D. Bingham (Simon Fraser University, Canada), A. Dean (Ohio State University), T. Santner (Ohio State University), B. Ankenman (Northwestern University), B. Nelson (Northwestern University).

**Theme of workshop:** The objective of this workshop is to bring researchers from the deterministic computer experiment and stochastic simulation experiment communities together to share advances and diverse approaches for efficient design and analysis of such experiments.

Some of the challenges that both the stochastic simulation and deterministic computer simulation communities face arise from inputs that can be qualitative, quantitative, or a mixture of these two types. These experiments may include large numbers of inputs, not only control variable inputs but also inputs that describe environmental variation. The input regions may be constrained rather than hyper rectangular. Their outputs can be univariate, multivariate, or functional. In the case of multivariate output, the objective can be constrained optimization, contour estimation, or determination of Pareto optima. The cross-fertilization of ideas and approaches of the two research fields offers a natural confluence to spur the development of new methodology.

The presentations and panel discussions will be organized in sessions around the following themes:

- *Applications of computer and stochastic simulation experiments*
- *Design of computer experiments*
- *Prediction methodology*
- *Stochastic simulation experiments*
- *Input uncertainty*
- *Sensitivity analysis*
- *Calibration experiments*

**Poster sessions:** All participants are invited to submit abstracts for posters. Interested participants should indicate so on the application form and submit a title and abstract to [programmes@newton.ac.uk](mailto:programmes@newton.ac.uk). Poster abstracts will not be accepted after **31 May 2011**.

**Programme details:** Sessions will start on Monday 5 September at 9 am and it is envisaged that the last session will end by 4 pm on Friday 9 September. A full detailed programme will be available on the web in due course.

**Further information and application forms** are available from the website at: [www.newton.ac.uk/programmes/DAE/daew05.html](http://www.newton.ac.uk/programmes/DAE/daew05.html). Closing date for the receipt of applications is **31 May 2011**.

## INTERNATIONAL MATHEMATICS COMPETITION

### Preliminary Announcement

The *18th International Mathematics Competition*, which is co-organized by University College London and hosted by the American University in Bulgaria, Blagoevgrad, Bulgaria, will take place from 28 July to 3 August 2011. 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 seventeen competitions there have been participants from over one hundred and ninety-three institutions in forty-five countries.

- July 28 Arrival and Registration
- 29 Opening Ceremony, Additional Registration, Meeting of the Jury
- 30 First Exam Day
- 31 Second Exam Day
- August 1 Meeting of the Jury
- 2 Closing Ceremony, Final Dinner
- 3 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 29 July 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 website <http://www.imc-math.org.uk>). Additional topics may also be 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 2011**, providing the following information: University; City; Country; Leader of the team (name, email address); Students (number); Mailing address; Email address; Fax.

The participants from some countries will need a visa to enter Bulgaria. Please 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 28 July to breakfast on 3 August, 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: +44-20-7388 7494; email: [j.jayne@ucl.ac.uk](mailto:j.jayne@ucl.ac.uk)). For further information visit the website at [www.imc-math.org.uk](http://www.imc-math.org.uk).

## THE MCKAY AND BROUÉ CONJECTURES

A meeting on *The McKay and Broué Conjectures* will take place on 12 April 2011 at the University of Southampton. Much of the recent work in the representation theory of finite groups has centered around the fundamental abelian defect group conjecture of Broué, and a web of related conjectures,

## HEILBRONN INSTITUTE FOR MATHEMATICAL RESEARCH, BRISTOL

### GEOMETRIC GROUP THEORY WORKSHOP

20–24 June 2011

**Organisers:** Piotr Nowak, Graham Niblo, Talia Fernos, John Britnell.

**Theme of conference:** This summer the Heilbronn Institute for Mathematical Research will host a five-day workshop on geometric group theory for up to 50 participants. The workshop will focus on the interactions between geometric group theory and non-commutative geometry, in particular approximation properties including amenability, the Haagerup property, property A (group  $C^*$ -exactness) and their connections to homology and cohomology theories of groups. The workshop will feature 'ask-the-expert' sessions aimed at junior mathematicians and an open problem session.

We encourage participants to offer contributed talks; however, as we plan to schedule time for informal collaboration, we cannot guarantee that all these offers will be taken up.

#### Main speakers:

Arthur Bartels (Universität Münster)  
Jacek Brodzki (University of Southampton)  
Martin Bridson (University of Oxford)  
Cornelia Druţu (University of Oxford)  
Steve Ferry (Rutgers University)  
Erik Guentner (University of Hawaii)

Nigel Higson (Pennsylvania State University)  
John Roe (Pennsylvania State University)  
Alain Valette (Université de Neuchâtel)  
Guoliang Yu (Vanderbilt University)  
Andrzej Żuk (Université Paris 7)

Thanks to the Heilbronn Institute, we can offer some support to UK graduate students and postdocs.

We are also grateful to the NSF which has provided funding for US-based graduate students and postdocs (pending final approval): we can cover travel expenses of approximately eight to ten US postdocs and graduate students. We particularly encourage women, minorities, persons with disabilities and groups underrepresented in mathematical sciences to apply. Please fill out the registration form on the conference website to apply for any financial support.

**Further information and registration forms** are available at: [www.math.tamu.edu/~pnowak/index/workshop.html](http://www.math.tamu.edu/~pnowak/index/workshop.html).

notably the McKay conjecture. An underlying idea of these conjectures is that certain aspects of the representation theory of a finite group should be determined 'locally', that is, by the representation theory of so-called local subgroups (e.g., the normalisers of  $p$ -Sylow subgroups).

The aim of the meeting is to give an introduction to this circle of ideas, accessible to a wide audience. The speakers are:

- Charles Eaton (Manchester)
  - Jeremy Rickard (Bristol)
  - Joe Chuang (City University London)
- The meeting is part of the South England Profinite Groups series which is supported by an LMS Scheme 3 grant. For further information visit the website at [www.personal.soton.ac.uk/as27g08/McKayBroue.html](http://www.personal.soton.ac.uk/as27g08/McKayBroue.html) or email the organiser Alexander Stasinski ([a.stasinski@soton.ac.uk](mailto:a.stasinski@soton.ac.uk)).

## THE BIRCH AND SWINNERTON-DYER CONJECTURE

A conference on *The Birch and Swinnerton-Dyer Conjecture* will take place at the Department of Pure Mathematics and Mathematical Statistics, University of Cambridge from 4 to 6 May 2011. It marks the 50th anniversary of the Birch-Swinnerton-Dyer Conjecture and aims both to explain the status of our knowledge and to reflect on the modern approaches to the conjecture and related problems. It is linked to a Royal Society Kavli Centre workshop from 2 to 3 May on the same topic. Invited participants are:

- Bryan Birch (Oxford)
- Manjul Bhargava (Princeton)
- Mirela Çiperiani (Austin)
- John Cremona (Warwick)
- Henri Darmon (Montreal)
- Vladimir Dokchitser (Cambridge)
- Roger Heath-Brown (Oxford)
- Minhyong Kim (London)
- Karl Rubin (Irvine)
- Peter Schneider (Münster)
- Samir Siksek (Warwick)
- Christopher Skinner (Princeton)
- William Stein (Seattle)
- Ramdorai Sujatha (Mumbai)
- Peter Swinnerton-Dyer (Cambridge)
- John Tate (Austin)
- Andrew Wiles (Princeton/Oxford)
- Christian Wuthrich (Nottingham)

Support for UK PhD students is available. Ask your supervisor to email a short confirmation that the conference is relevant for your research, and register as soon as possible and by **31 March** at the latest. To register and for more information visit the website at [www.dpmms.cam.ac.uk/~td278/BS2011](http://www.dpmms.cam.ac.uk/~td278/BS2011) or email [birchswinnertondyer@gmail.com](mailto:birchswinnertondyer@gmail.com).

The conference is organised by John Coates (DPMMS) and Tim Dokchitser (DPMMS) and is supported by an LMS Conference grant and by the Royal Society.

## MATHEMATICS OF FILTERING AND ITS APPLICATIONS

The first interdisciplinary workshop on *Mathematics of Filtering and its Applications* will be held at Brunel University from 13 to 15 July 2011. At this workshop, speakers from a variety of fields including target tracking, bioinformatics, econometrics and meteorology will present their current research. The workshop is intended as a forum for researchers from these different fields to meet and exchange knowledge about mathematical innovations in filtering, as applied in their field of research. Ample time will be provided for discussing future research collaborations. There are six invited lectures planned in addition to contributed sessions. The invited speakers (with field of specialization in brackets) are:

- Brendan McCabe, University of Liverpool (econometrics)
- Simon Godsill, University of Cambridge (signal processing)
- Zidong Wang, Brunel University (bioinformatics)
- Stephen Roberts, University of Oxford (pattern recognition)
- Lyudmila Mihaylova, Lancaster University (target tracking)
- Peter van Leeuwen, University of Reading (meteorology)

An application form along with further information is available at [www.brunel.ac.uk/~mastpmd/MathematicsofFiltering.pdf](http://www.brunel.ac.uk/~mastpmd/MathematicsofFiltering.pdf). Contact Dr P. Date ([paresh.date@brunel.ac.uk](mailto:paresh.date@brunel.ac.uk)) or Professor Z. Wang ([zidong.wang@brunel.ac.uk](mailto:zidong.wang@brunel.ac.uk)) for further information. The deadline for registration is **13 May 2011**. The workshop is supported by an LMS Conference grant and the Department of Mathematical Sciences at Brunel University.

## GAUGE THEORY AND COMPLEX GEOMETRY

A conference and workshop on *Gauge Theory and Complex Geometry* will take place from 4 to 23 July 2011 in the School of Mathematics, University of Leeds. The first part is the conference, from 4 to 8 July, at which the main invited speakers will lecture on their work. They are:

- Sir Michael Atiyah (University of Edinburgh)
- Steven Bradlow (University of Illinois, Urbana-Champaign)
- Jim Bryan (University of British Columbia)
- David Calderbank (University of Bath)
- Sergey Cherkis (Trinity College, Dublin)
- Benoit Charbonneau (University of Waterloo)
- Simon Donaldson (Imperial College London)
- Maciej Dunajski (University of Cambridge)
- Michael Eastwood (Australian National University)
- José Figueroa-O'Farrill\* (University of Edinburgh)
- Oscar García-Prada (CSIC, Madrid)
- Amihay Hanany (Imperial College London)
- Tamás Hausel (University of Oxford)
- Nigel Hitchin (University of Oxford)
- Jacques Hurtubise (McGill University)
- Marcos Jardim (Universidade Estadual de Campinas)
- Lionel Mason (University of Oxford)
- Vincent Minerbe (Paris 6)
- Vicente Muñoz (CSIC, Madrid)
- Ed Segal (Imperial College London)
- Balázs Szendrői (University of Oxford)
- Andrei Teleman (Université de Marseilles)
- Richard Thomas (Imperial College London)
- Richard Ward (Durham University)
- Richard Wentworth\* (University of Maryland)

\* to be confirmed

For further information visit the website at [www.maths.leeds.ac.uk/pure/geometry/gtcg](http://www.maths.leeds.ac.uk/pure/geometry/gtcg). Limited financial assistance is available for PhD students. Apply to one of the organizers: Roger Bielawski ([rb@maths.leeds.ac.uk](mailto:rb@maths.leeds.ac.uk)) or Martin Speight ([speight@maths.leeds.ac.uk](mailto:speight@maths.leeds.ac.uk)). The meeting is

supported by an LMS Conference grant and by EPSRC research grant EP/I03322X/1.

## VMS 2011

A workshop on *Variational Multiscale Methods* (VMS2011) will take place from 8 to 9 June 2011 at the University of Strathclyde, Glasgow. This meeting aims to discuss recent progress in the field of variational multi-scale methods, both as multiscale methods and on its relation to stabilized finite-element methods, along with their connection to other solution strategies, such as DG methods. Applications of the resulting methods to more challenging situations, such as turbulence modeling, flow through porous media, visco-elastic flows, as well as implementation issues are also very welcome. The workshop will provide an excellent introduction to the subject area for younger researchers. In addition, time will be made available for discussions and to allow the formation of new collaborations. The preliminary list of speakers is:

- Lubomir Banas (Heriot-Watt, UK)
- Malte Braack (Kiel, Germany)
- Erik Burman (Sussex, UK)
- Victor Calo (KAUST, Saudi Arabia)
- Daniela Capatina (Pau, France)
- Tomás Chacón (Sevilla, Spain)
- Ramon Codina (Barcelona, Spain)
- Sebastian Franz (Limerick, Ireland)
- Ivan Graham (Bath, UK)
- Volker Gravemeier (Munich, Germany)
- Volker John (Berlin, Germany)
- Sebastien Loisel (Heriot-Watt, UK)
- Gert Lube (Göttingen, Germany)
- Julia Novo (Madrid, Spain)
- Lutz Tobiska (Magdeburg, Germany)
- Garth Wells (Cambridge, UK)

Limited financial assistance is available for PhD students. Apply to the organizer Gabriel R. Barrenechea ([gabriel.barrenechea@strath.ac.uk](mailto:gabriel.barrenechea@strath.ac.uk)). For further information visit the website at [www.mathstat.strath.ac.uk/vms\\_2011](http://www.mathstat.strath.ac.uk/vms_2011). The workshop is supported by an LMS Conference grant and the Edinburgh Mathematical Society.

### ARTIN

The 28th meeting of *Algebra and Representation Theory in the North* (ARTIN) will be held in the Department of Mathematics, University of Aberdeen from 16 to 18 May 2011. A provisional list of speakers includes:

- H. Andersen (Aarhus)
- A. Craw (Glasgow)
- J. Chuang (London) tbc
- I. Gordon (Edinburgh) tbc
- A. King (Bath)
- K. McGerty (Oxford)
- J. Michel (Paris)
- A. Premet (Manchester) tbc
- R. Tange (York)
- G. Williamson (Oxford) tbc

For further information visit the website at [www.maths.abdn.ac.uk/artin/meeting.php?id=28](http://www.maths.abdn.ac.uk/artin/meeting.php?id=28) or contact the organizer Alexey Sevastyanov ([a.sevastyanov@abdn.ac.uk](mailto:a.sevastyanov@abdn.ac.uk)). The ARTIN meetings take place at the universities of Aberdeen, Edinburgh, Glasgow, Leeds, Manchester, Newcastle, Sheffield and York. ARTIN is supported by an LMS Scheme 3 grant, the Representation Theory Across the Channel EPSRC Network Grant and the Glasgow Mathematical Journal Trust.

### INTERNATIONAL PURE MATHEMATICS CONFERENCE 2011

The *12th International Pure Mathematics Conference 2011* (12th IPMC 2011) is part of a series of pure mathematics conferences that take place in Islamabad every year in July/August. It is a thematic conference on Algebra, Geometry and Analysis held under the auspices of Algebra Forum ([www.algebraforum.org.pk](http://www.algebraforum.org.pk)) and the Pakistan Mathematical Society ([www.pakms.org.pk](http://www.pakms.org.pk)).

This year the conference will take place from 29 to 31 July 2011 in Islamabad. There

will be free housing for foreign participants. Some travel grants are available for foreign speakers. Several recreational trips will be organized in and around Islamabad introducing the unique local and multi-ethnic culture. For further information and the on-line registration form visit the website at [www.pmc.org.pk](http://www.pmc.org.pk). The conference is convened by Professor Dr Qaiser Mushtaq (Dean, Faculty of Natural Sciences, Quaid-i-Azam University, Islamabad, Pakistan).

### NUMERICAL AND COMPUTATIONAL ASPECTS OF SPECTRAL GEOMETRY

A two day workshop on *Numerical and Computational Aspects of Spectral Geometry* will take place from 14 to 15 April 2011 at the School of Mathematical Sciences, Loughborough University. The workshop will focus on areas around the computation of eigenvalues and resonances of non-trivial geometries such as planar domains in flat space but also compact and non-compact manifolds. Eigenvalue problems of this kind show up in different contexts such as number theory, quantum chaos, wave and inverse scattering, or simply in spectral geometry. The workshop aims at bringing together people from these different fields to discuss the most recent advances in both rigorous and non-rigorous numerical methods to compute the spectral data in different geometric situations. Speakers include:

- Clara Lucia Aldana (Lisbon)
- Timo Betcke (Reading)
- Peter Buser (Lausanne)
- Marco Marletta (Cardiff)
- Andreas Strömbergsson (Uppsala)
- Simon Chandler-Wilde (Reading)

For further information and registration visit the website at [www-staff.lboro.ac.uk/~maas3/eignum11/](http://www-staff.lboro.ac.uk/~maas3/eignum11/). The workshop is supported by an LMS Conference grant.



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## SPECTRAL ANALYSIS AND ITS APPLICATIONS

### LMS–EPSRC Short Course

University College London, 26 June – 1 July 2011

Organisers: Professor Leonid Parnovski and Dr Yiannis Petridis

#### Course outline and prerequisites

Spectral theory of linear operators in Hilbert and Banach spaces is an area of mathematics which, besides being an interesting subject in its own right, has many applications and connections with other disciplines, like geometry (can you hear the shape of a drum?), number theory (counting points on certain algebraic varieties), partial differential equations, probability (Anderson localisation) and physics (Schrödinger equation and scattering frequencies of atoms). The five-day course will present some of these connections without assuming that the students have studied spectral theory. The course will consist of four lecture courses, four or five lecture each:

- *Spectral geometry* (Iosif Polterovich, Université de Montréal)
- *Random operators* (David Damanik, Rice University)
- *Spectral theory of locally symmetric spaces and applications to number theory* (Akshay Venkatesh, Stanford University)
- *Spectral theory of N-body Schrödinger operators* (Jan Philip Solovej, University of Copenhagen)

For further information see: [www.homepages.ucl.ac.uk/~ucahlepc/conference.htm](http://www.homepages.ucl.ac.uk/~ucahlepc/conference.htm).

#### Application

Applications should be made using the registration form available via the Society's website at: [www.lms.ac.uk/content/short-instructional-courses](http://www.lms.ac.uk/content/short-instructional-courses).

The closing date for applications is **Thursday 28 April 2011**. 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. **They will not be charged for subsistence costs.**
- UK-based postdocs will be charged a registration fee of £100, plus half the subsistence costs (£135), £235 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 (£270), £520 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.





**Department of Mathematical Sciences**

<http://www.durham.ac.uk/mathematical.sciences>

**Lecturer in Applied Mathematics**

**Closing date:** 26 April 2011

**Web link:** [http://ig5.i-grasp.com/fe/tpI\\_durham01.asp?newms=jj&id=67066](http://ig5.i-grasp.com/fe/tpI_durham01.asp?newms=jj&id=67066)

The successful candidate will have an excellent research record in an area of Applied Mathematics other than theoretical particle physics or general relativity. Preference may be given to candidates with research interests which mesh with existing ones in the department: continuum mechanics, computational applied mathematics, partial differential equations, mathematical biology/medicine, applied dynamical systems. He or she will be expected to undertake and publish original research of the highest level, to contribute to the research activities of the Applied Mathematics research unit and of the department as a whole, and to undertake teaching and administrative duties as assigned by the Head of Department of Mathematical Sciences.

Applications from holders of personal fellowships would be welcome.

For appointment at Grade 8 candidates will need to provide evidence of relevant teaching experience at University level and a significant record of publications at international level.

**Contact details:**

Professor Brian Straughan

Telephone: 0191 3343102

Email: [brian.straughan@durham.ac.uk](mailto:brian.straughan@durham.ac.uk)

Professor Paul Mansfield

Telephone: 0191 3343104

Email: [p.r.w.mansfield@durham.ac.uk](mailto:p.r.w.mansfield@durham.ac.uk)



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## DUALITY, BSDEs AND MALLIAVIN CALCULUS IN MATHEMATICAL FINANCE

### LMS–EPSRC Short Course

Oxford-Man Institute of Quantitative Finance, University of Oxford  
18–22 July 2011

Organiser: Dr Michael Monoyios

#### Course outline

Mathematical finance now routinely uses advanced methods from functional and stochastic analysis to solve control problems associated with optimal trading in financial markets. Duality methods have been at the forefront of these advances. Dynamic versions of such control problems lead naturally to solutions of Backward Stochastic Differential Equations (BSDEs). The control parameter in such equations can be interpreted as the Malliavin derivative of a process which matches a given terminal objective. The Malliavin calculus is a stochastic calculus of variations that is increasingly finding applications in financial models. The course will consist of three lecture courses, each of five to six lectures in these topics, aimed at first-year graduate research students in Financial Mathematics:

- *Duality methods* (Dmitry Kramkov, Carnegie Mellon University)
- *Malliavin calculus* (Josef Teichmann, ETH)
- *BSDEs* (Nizar Touzi, École Polytechnique)

For further information see: [www.oxford-man.ox.ac.uk/events/conferences.html](http://www.oxford-man.ox.ac.uk/events/conferences.html).

#### Application

Applications should be made using the registration form available via the Society's website at: [www.lms.ac.uk/content/short-instructional-courses](http://www.lms.ac.uk/content/short-instructional-courses).

The closing date for applications is **Friday 27 May 2011**. 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. If demand is high, it may be possible to make additional places available, though financial support will not be available beyond a limited number of participants.

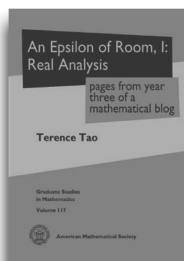
#### Fees

- **UK university research students** will be charged a registration fee of £100. There are a limited number of places available on a first-come, first-served basis where ALL subsistence costs will be covered; otherwise applicants will be responsible for covering ALL subsistence costs.
- **UK-based postdocs** will be charged a registration fee of £100. There are a limited number of places available on a first-come, first-served basis where 50% subsistence costs will be covered; otherwise applicants will be responsible for covering ALL subsistence costs: approximately £270
- For **overseas students, postdocs and industry professionals** registration will be £250. Accommodation and food costs will NOT be covered: approximately £350.

All participants must pay travel costs (EPSRC-funded students should be covered by their DTA). Subsistence costs are not covered unless participants fit into the categories above. 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.

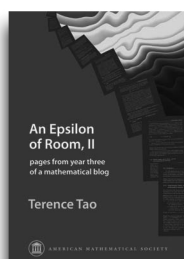
**LMS–EPSRC Short Courses** aim to provide training for postgraduate students in core areas of mathematics. Part of their success is the opportunity for students to meet other students working in related areas as well as the chance to meet a number of leading experts in the topic.

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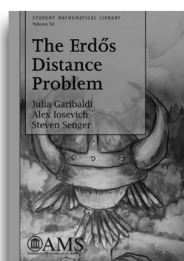
#### AN EPSILON OF ROOM, I: REAL ANALYSIS pages from year three of a mathematical blog

Terence Tao, *University of California*  
Graduate Studies in Mathematics, Vol. 117  
Mar 2011 333pp 978-0-8218-5278-1 Hardback £45.95



#### AN EPSILON OF ROOM, II pages from year three of a mathematical blog

Terence Tao, *University of California*  
In 2007 Terry Tao began a mathematical blog to cover a variety of topics, ranging from his own research and other recent developments in mathematics, to lecture notes for his classes, to nontechnical puzzles and expository articles. The first two years of the blog have already been published by the American Mathematical Society. The posts from the third year are being published in two volumes. The first volume consists of a second course in real analysis, together with related material from the blog. The second volume contains a broad selection of mathematical expositions and self-contained technical notes in many areas of mathematics, such as logic, mathematical physics, combinatorics, number theory, statistics, theoretical computer science, and group theory.  
Apr 2011 252pp 978-0-8218-5280-4 Paperback £31.50



#### THE ERDŐS DISTANCE PROBLEM

Julia Garibaldi, Alex Iosevich, *University of Rochester* <sup>2</sup>  
Steven Senger, *University of Missouri-Columbia*

The Erdős problem asks, What is the smallest possible number of distinct distances between points of a large finite subset of the Euclidean space in dimensions two and higher? The main goal of this book is to introduce the reader to the techniques, ideas, and consequences related to the Erdős problem.

Student Mathematical Library, Vol. 56  
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## UK HARMONIC ANALYSIS AND PDEs RESEARCH NETWORK MEETING

### Report

The UK Harmonic Analysis and PDEs Research Network – generously supported by the LMS under its Scheme 3 grant programme – held its seventeenth meeting in the University of Edinburgh on 11 February 2011. About 30 people attended from the UK, Ireland and Spain. There were three talks, by Terence Tao, Lillian Pierce and Susana Gutiérrez. We believe this is the first meeting of the network which has featured both a Fields Medallist and an absolute majority of women speakers!

Terry Tao (UCLA) spoke on *Recent progress on restriction by Bourgain and Guth*. He gave a masterly overview of some very fundamental new work by Bourgain and Guth on the famous restriction problem for the Fourier transform. This work is squarely based upon previous work on the multilinear Kakeya problem by Tao himself together with two of the network members – Bennett and Carbery. Terry explained in very clear terms how this work can be used to obtain what are now the best-known estimates for the restriction problem. It is particularly pleasing to note that the bulk of the work on the multilinear Kakeya problem was undertaken while Terry was the LMS Hardy Lecturer at the University of Edinburgh in 2004.

Lillian Pierce (Oxford) gave a lovely talk on *Discrete analogues in harmonic analysis*. Discrete problems have a habit of being beautiful but difficult. In this talk Lillian surveyed a menagerie of discrete analogues of operators arising in harmonic analysis, including singular integral operators, maximal functions, fractional integral operators, and Radon transforms. We saw what makes a discrete operator easy or hard to treat, and Lillian outlined some of the methods that are breaking

new ground, key aspects of which come from number theory. In particular, she highlighted the roles played by theta functions, exponential sums, Waring's problem, and the circle method of Hardy and Littlewood.

Susana Gutiérrez (Birmingham) gave a very interesting talk entitled *1D cubic Schrödinger equations and related vortex dynamics*. In the framework of fluid dynamics, the Localised Induction Approximation (LIA, for short) models the dynamics of a vortex filament within an ideal fluid. Susana's talk provided a broad perspective on some recent results in the study of self-similar solutions of LIA leading to a singularity formation in finite time. Much of the analysis of the properties of these singular solutions relies upon the highly surprising connection of LIA with certain cubic Schrödinger equations.

Both Terry and Susana had to leave immediately after the event, but a very pleasant informal dinner was enjoyed by Lillian, some of the PhD students, postdocs, visitors and academic staff.

Tony Carbery  
University of Edinburgh

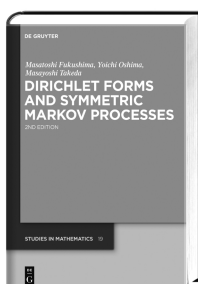
## SPECTRAL THEORY AND PDEs

The half-day meeting on *Spectral Theory and PDEs* will take place at the University of Kent (Canterbury) on the afternoon of Tuesday 24 May 2011. The meeting will focus particularly on non-selfadjoint operators and operators on networks. There will be presentations by the following speakers:

- Joachim von Below (Université du Littoral, Calais, France)
- Brian Davies (King's College London)
- Ian Wood (University of Kent)

The meeting is supported by an LMS Conference grant. Some support for UK registered research students is available. For further information contact the organiser Ian Wood (i.wood@kent.ac.uk).

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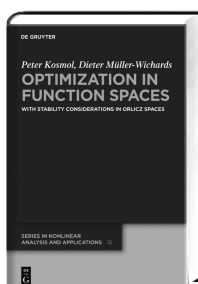
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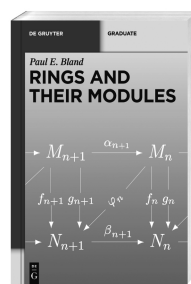
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## REVIEW

**The Shape of Inner Space** by Shing-Tung Yau and Steve Nadis, Basic Books, 2010, 378 pp, US \$30.00, £20.00, ISBN: 978-0-4650-2023-2.

This book tells the fascinating story of strange geometric objects that have achieved some fame outside of mathematics: *Calabi–Yau manifolds*. Inspired by an open question in geometry, Shing-Tung Yau goes in search of a weird multi-dimensional object he thought didn't exist, finds it, and wins the Fields medal for his efforts. A year later theoretical physicists noticed that the object he found, or rather objects, for there are many, are just what they needed. String theory claims that we live in a ten-dimensional universe. Since we can only perceive four of these dimensions, the other six must be hiding somewhere. As it turns out, the kind of object that can harbour the six extra dimensions and cater to other requirements of string theory is a Calabi–Yau manifold. String theory claims that every point in the 4D space we can perceive is in fact a tiny little 6D world with the structure of a Calabi–Yau manifold.

The story is told by Shing-Tung Yau himself, with the help of the science writer Steve Nadis. On a recent visit to London, Yau was adamant that mathematics should be brought to the masses without dumbing down or glossing over the tricky parts. And this is just what this book sets out to achieve. While aimed at a general audience, it doesn't just tell the story of Calabi–Yau manifolds, but explores their mathematics in detail.

The book takes a broad approach, starting with a look at the intertwined history of geometry and physics. This sets the scene to explain the question, first asked by the mathematician Eugenio Calabi, which eventually led

Yau to the famous manifolds. True to Yau's conviction, the mathematics is at the forefront throughout the book. Every single technical term in Calabi's conjecture is explained, and there's a chapter devoted to Yau's proof as well as the mathematical machinery developed for it. Yau and Nadis explore the manifolds' relevance to string theory, but also another interesting twist to the story: while geometry boosted string theory, string theory in turn revived a nearly forgotten area of geometry, concerned with counting the

number of rational curves that can fit on a given manifold. Techniques from string theory eventually provided the answer to a question first posed by Hermann Schubert in the 19th century involving quintic manifolds. The book wraps up by exploring how and if all of this is relevant to the real world and pondering the connections between mathematics, beauty and truth.

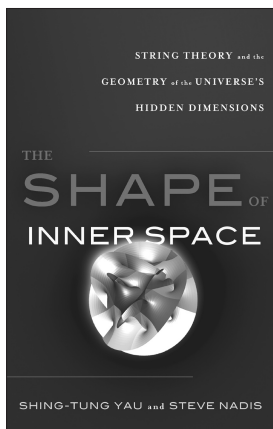
The collaboration between a mathematician and a science writer has worked wonders in this book. It's crowded with

beautiful metaphors that clarify complex ideas and provide a peek into higher-dimensional worlds. Personally, I already knew a little bit about some of the mathematics involved, yet I had several penny-dropping moments I wish I'd had when I was first studying it.

One thing that comes through on every page of this book is the beauty of the mathematics and its power to shed light on the secrets of our Universe. This, therefore, is a great book to while away those dark winter evenings.

Marianne Freiberger  
Co-editor, *Plus*

A version of this review first appeared in *Plus* magazine (<http://plus.maths.org>). *Plus* has also published an article based on an interview with Shing-Tung Yau; see <http://plus.maths.org/content/node/5388>.



## 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](http://www.lms.ac.uk/newsletter/calendar.html)).

Please send updates and corrections to [calendar@lms.ac.uk](mailto:calendar@lms.ac.uk).

### 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)

**6-8** Young Functional Analysts' Workshop, York (402)

**9-22** Edinburgh International Science Festival, Edinburgh (402)

**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)

**12** The McKay and Broué Conjectures Meeting, Southampton (402)

**14-15** Numerical and Computational Aspects of Spectral Geometry Workshop, Loughborough (402)

**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)

**2-5** Women in Applied Mathematics Meeting, Heraklion

**3-6** Multiple Zeta Values, Modular Forms and Elliptic Motives Workshop, Bristol (401)

**4-6** The Birch and Swinnerton-Dyer Conjecture Conference, Cambridge (402)

**5** **LMS Spitalfields Day, INI, Cambridge**

**6** **Women in Mathematics Day, London (402)**

**12** Teaching Students to Write Mathematics Workshop, Leeds (402)

**16-18** Algebra and Representation Theory in the North Meeting, Aberdeen (402)

**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)

**23-25** Wales Mathematics Colloquium, Gregynog Hall, Powys (402)

**24** Spectral Theory and PDEs Meeting, Canterbury (402)

**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)

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

**8-9** Variational Multiscale Methods Workshop, Strathclyde (402)

**13-17** Stabilization of Dynamical Systems and Processes ICMS Workshop, Edinburgh (398)

**13-17** Arithmetic of Function Fields Workshop, Imperial College London  
**14 LMS Midlands Regional Meeting, Birmingham (402)**  
**15-18** Representation Theory Workshop, Birmingham (401)  
**18-22** Duality, BSDEs and Malliavin Calculus in Mathematical Finance LMS–EPSRC Short Course, Oxford (402)  
**20-24** Geometric Group Theory Workshop, Heilbronn Institute, Bristol (402)  
**20-24** Geometric Analysis ICMS Workshop, Edinburgh (398)  
**26 - 1 Jul** Spectral Analysis and Its Applications LMS–EPSRC Short Course, University College London (402)  
**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 Processing with Adaptive Sparse Structured Representation, ICMS Workshop, Edinburgh (398)  
**29 LMS Popular Lectures, Institute of Education, London (402)**  
**30** Providing a Mathematics and Statistics Support Service Using *Elluminate*, Loughborough (402)

## JULY 2011

**1 LMS Meeting, London**  
**1** Developing Mathematical Thinking Through Problems, Puzzles and Games Workshop, Greenwich (402)  
**4-8** Theories of Infinity ICMS–ESF Meeting, Edinburgh (398)  
**4-23** Gauge Theory and Complex Geometry Conference and Workshop, Leeds (402)  
**9-11** Quantum Cohomology, Symplectic Resolutions and Representation Theory Meeting, Oxford

**11-15** Numerical Relativity Beyond Astrophysics ICMS Workshop, Edinburgh (398)  
**13-15** Mathematics of Filtering and its Applications Workshop, Brunel University (402)  
**16-24** International Mathematical Olympiad, Amsterdam  
**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** Olga Taussky-Todd Lecture (B. Pelloni), ICIAM 2011, Vancouver, Canada (402)  
**19 LMS Northern Regional Meeting, Leeds (402)**  
**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)  
**28 - 3 Aug** International Mathematics Competition, Blagoevgrad, Bulgaria (402)  
**29-31** IPMC 2011, Islamabad, Pakistan (402)

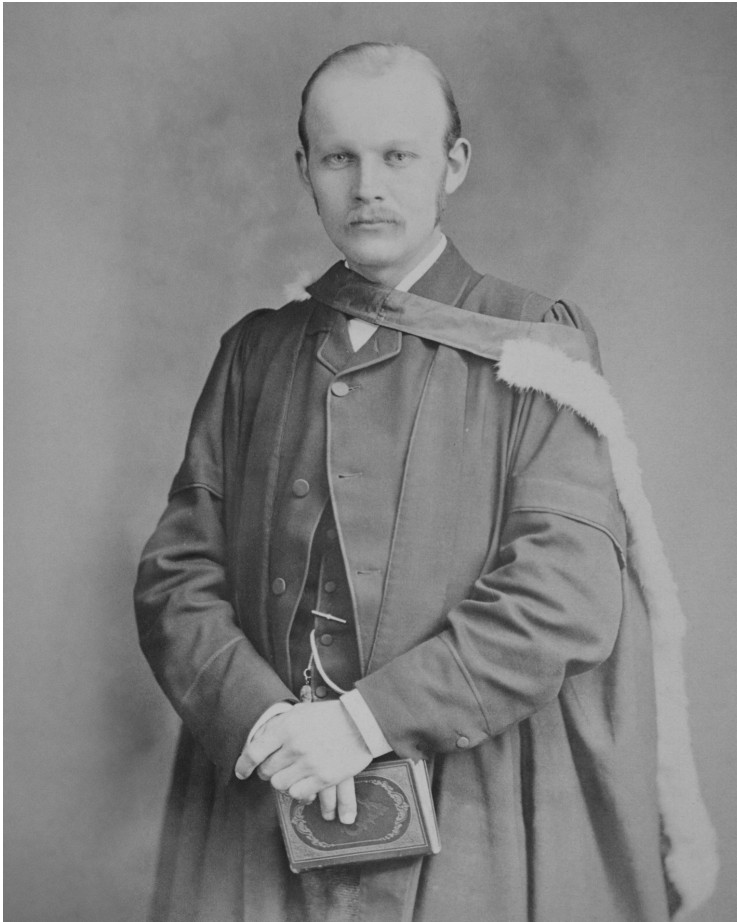
## AUGUST 2011

**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)



# W. THOMSON

LMS member 1884–1899



J. Moffat, Edinburgh

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