

# THE LONDON MATHEMATICAL SOCIETY



## NEWSLETTER

No. 378 February 2009

### Society Meetings and Events

#### 2009

**Friday 27 February**  
Mary Cartwright  
Lecture, London  
[page 17]

**31 March – 4 April**  
LMS Invited Lectures  
Edinburgh [page 16]

**Friday 3 July**  
London

**Wednesday 15 July**  
SW & South Wales  
Regional Meeting  
Southampton

**Wednesday  
16 September**  
Midlands Regional  
Meeting, Leicester

**Friday 20 November**  
AGM, London

**4–6 December**  
Joint Meeting with the  
Belgian Mathematical  
Society

### NEW YEAR HONOURS LIST

We extend congratulations to Martin Taylor, FRS, Professor of Pure Mathematics at the University of Manchester, on the award of a knighthood for services to Science. Professor Taylor served as LMS President 1998–2000, and is currently Physical Secretary and Vice-President of the Royal Society. He was awarded the LMS Whitehead prize in 1982 and was the first Fröhlich Lecturer in 2003. He proved the Fröhlich Conjecture relating the symmetries of algebraic integers to the behaviour of certain analytic functions called Artin  $L$ -functions.



Sir Martin Taylor, FRS

### BALLOTING FOR A NEW UNIFIED MATHEMATICAL SOCIETY

The time is at hand. As the old television presenter used to say, it is 'make your mind up time'! The Councils of the LMS and of the IMA have commended the proposal for a new mathematics society to their members and now it is for those members to vote on the proposal. If you didn't get a chance to attend one of the meetings that the two Presidents held at various venues around the country, you can still get involved by using the NUMS website [www.newmathsoc.org.uk](http://www.newmathsoc.org.uk). There you will find views in favour and against the proposal and also have an opportunity to hear what the Presidents had to say. You can even still contribute to the debate yourself.

The worst possible result for the two societies would not be an overwhelming rejection or acceptance but a poor turnout. A low vote in either society would make difficulties for that Council. Please, therefore, if you do nothing else – vote. We need a decisive result.

Charles Evans,  
Honorary Secretary IMA  
Charles Goldie,  
General Secretary LMS

### SAVE THE LMS

LMS members may think the merger is already decided, and that there is nothing they can do, but that is not the case. Nor should they feel that they ought to defer to the decision of the Council: the LMS Council had no more information to go on than the members have and, moreover, could depend on the later membership vote as a safety net. The LMS members face the real choice whether they want to merge with the IMA or not. We think the merger would be a terrible mistake, and we have set up a web page at <http://savelmss.wordpress.com/> to encourage a discussion. Here are the points we think most important.

What we value most about the LMS is that it provides what mathematicians most need: excellent journals and access to small but useful grants, with almost no bureaucracy or hierarchy. It has been working this way for a long time, and over the years has won a very high reputation and the loyalty of a large number of

mathematicians all over the world. In our view, most of this will be lost if we 'merge' with the IMA.

It is clear in the proposal for the new society that it would have a significantly greater bureaucratic structure. This is pretty much inevitable, given the very wide range of interests it would have to serve. Do we really need even more bureaucracy in our lives?

The new society would have an explicit hierarchy, with its Fellowship grade, completely against the tradition of the LMS.

The reserved fund, as described in the proposal, would not be big enough, so there will be a reduction in the level of grant support. Nor is the fund's purpose sharply enough defined, and so what support there is will be spread over a wider range of activities.

Former LMS members would not be able to do anything about this, being outvoted by 2 to 1. This outvoting would happen first in the choice of a name for the new society.

Many people have said "nobody I know is in favour of this", which is heartening but

### LMS Newsletter

General Editor: Dr D.R.J. Chillingworth (D.R.J.Chillingworth@maths.soton.ac.uk)

Reports Editor: Dr S.A. Huggett (s.huggett@plymouth.ac.uk)

Reviews Editor: Mr A.J.S. Mann (a.mann@gre.ac.uk)

Administrative Editor: Miss S.M. Oakes (susan.oakes@lms.ac.uk)

Editorial office address: London Mathematical Society, De Morgan House, 57–58 Russell Square, London WC1B 4HS (t: 020 7637 3686; f: 020 7323 3655; e: [susan.oakes@lms.ac.uk](mailto:susan.oakes@lms.ac.uk), w: [www.lms.ac.uk](http://www.lms.ac.uk))

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.

News items and notices in the *Newsletter* are free to be used elsewhere unless otherwise stated, although attribution is requested when reproducing whole articles. Contributions to the *Newsletter* are made under a non-exclusive licence; please contact the author for the rights to reproduce. The LMS cannot accept responsibility for the accuracy of information in the *Newsletter*. Views expressed do not necessarily represent the views or policy of the London Mathematical Society.

Charity registration number: 252660.

also rather exasperating, because clearly some people do want the 'merger'. It should be noted, however, that those in favour of it did not form an overwhelming majority on the LMS Council: a couple more abstentions or votes against would have stopped the whole process.

It is very important to vote against this proposal. It has been presented as inevitable, but it is not, and LMS members can stop it. We only have one chance, though.

Alexandre Borovik, Stephen Huggett  
and Burt Totaro

<http://savelms.wordpress.com/>

## SAVE UK MATHEMATICS

I welcome the article by my Council colleagues Sasha (Alexandre), Stephen and Burt, as it allows me the opportunity to correct various misunderstandings. I take their points roughly in order.

*Discussion sites.* Why have they set up their own site, when the joint consultation site [www.newmathsoc.org.uk/](http://www.newmathsoc.org.uk/) has a discussion group at <http://groups.google.co.uk/group/newmathsoc> which they and everyone else have been free to post to? Having two sites hinders communication rather than helping it.

*What the LMS provides.* When Stephen joined in 1976 the LMS was concerned almost entirely with publications and meetings. By the time Sasha joined in 1992 grants had become salient, though at nothing like today's level, but when Burt joined in 2001 the Society had acquired De Morgan House and significantly expanded its activities, to include, among other things, engagement with research councils, with Government, with education bodies and much else. Such engagement is hardly an option in today's world where science is not a 'given', nor even mathematics within science; all has to be fought for. Involvement with policy

at national level must continue, and the expectation is that with a single unified voice, a national rather than a local title, and no duplication of effort, the new society will be able to do so more effectively.

*Bureaucracy.* It is good that the three authors recognise that the LMS has "almost no bureaucracy". Given that the new society will be doing the same things as the current ones, with the same staff and with officers and Council drawn from the same pool, there is no likelihood of any increase in bureaucracy; indeed the removal of duplication and the sharing of compliance duties that are exceptionally burdensome on small organisations (charity law, health & safety, employment law, etc., etc.) will allow more effort to be devoted to what the society is for, rather than to its 'housekeeping'. Our sister body the Royal Statistical Society went through a merger between a learned society and a professional body in the early 1990s, and its President in his letter to us (see the *responses* section of the consultation site) comments that the merger "greatly strengthened our position and voice". As a member of the RSS I can vouch for it being no bureaucracy. An idea of how the new society might look a few years after merger is provided by the fact that the RSS has over 7000 members, serviced by about 17 full-time equivalent staff – hardly an excessive number.

*Fellows.* The IMA set up Fellowships largely to allow mathematicians in industry to be able to demonstrate membership of a profession distinct from engineering, physics and so on, but it is interesting that 55% of the IMA Fellows are in higher education. In the Consultation Document (at [www.newmathsoc.org.uk/reports.html](http://www.newmathsoc.org.uk/reports.html), in case you haven't your copy to hand) it is stated in §2.9 that "Fellows will have no additional rights or privileges over other Members in the governance of the New Society (e.g. in Council or committee

membership) and there will be no compulsion or expectation for Members to take up Fellowship".

*Hierarchy.* I joined the LMS in 1968 to celebrate my promotion from Assistant Lecturer to Lecturer. That particular step in university hierarchy has long gone, but all the other grades, from Research Fellow through Lecturer, Senior Lecturer, Reader and Professor, remain, and then we have prizes and the FRS to strive for. Academe is the most hierarchical of professions, far more so than doctors or lawyers, for example, and in the light of that it seems odd to cavil at taking on a Fellowship grade from the IMA, for those who wish or need it.

*The Learned Activities Fund.* The authors claim that the Learned Activities Fund will not be big enough, nor its purpose sharply enough defined. Reserving the Fund within the new society is intended to specify only a minimum level of support for learned activities (Consultation Document §9.11). Within the IMA there is great admiration for the LMS grant schemes, and its own grants scheme was perhaps set up to emulate in a small way those of the LMS. Grant giving is thus not likely to diminish in the merged society. Within the LMS at present there is no protection for the sums intended for the Fund. The Fund was last discussed in detail in the LMS at the Council Retreat last June, attended by Sasha, Stephen and Burt. That resulted in a more thorough statement of the basis for the intended income from the Fund, but no dissent was raised over the size of the Fund or the definition of its purpose.

*The name of the new society.* It surely makes sense to have the vote on the name after the decision to merge, to avoid the possibility of the two existing societies voting in opposite directions. What little evidence there is suggests that any systematic differences on this issue will be regional rather than society-based. And it is only

democratic then to allow everyone one vote. Personally I hope that if we come to that point there will be articles in this *Newsletter* and on the web arguing the merits of the two alternative names, so that members may make a rational choice.

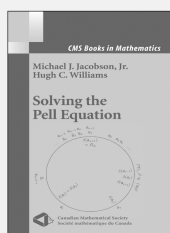
*'Outvoted'.* The new society is unlikely ever to need hold a general referendum, no further mergers being in the offing (thank heaven). So there will not be votes at which LMS members will be 'outvoted'. The four Constituencies will protect the interests of different groups within the new society, and the Learned Activities Constituency is likely to be much more an LMS affair than an IMA one. Indeed, within the IMA there are real fears that the LMS will dominate the merged society through academic members being generally more available for committees and officer posts.

*Members in favour.* As reported in the December *Newsletter*, the Presidents of the LMS and the IMA spent most of October and November holding meetings on the merger in universities throughout the UK. Contrary to the impression given in the above article, a substantial number of members of the LMS in these meetings expressed support. In the LMS Council, four times as many members voted for merger as voted against, an 'overwhelming majority' by any definition. The assertion that "a couple more abstentions or votes against would have stopped the whole process" is false. Two switched votes (or even more than two) would have given the same result, indeed still with an overwhelming majority.

*Conclusion.* It is very important to vote for this proposal. It has never been presented as inevitable, but LMS members can make it happen. The opportunity is there to create a national mathematical society fit for the present century. Seize it.

Charles Goldie  
General Secretary

## New from Springer



### Solving the Pell Equation

**M. J. Jacobson, Jr., H. C. Williams,**  
 University of Calgary, AB,  
 Canada

This book describes  
 modern (and surprising)  
 applications to crypto-

graphy. It includes the most recent advances,  
 with a deeper approach than any other book.

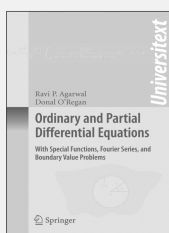
2009. Approx. 520 p. 20 illus. (CMS Books in  
 Mathematics) Hardcover  
 ISBN 978-0-387-84922-5 ► **€ 54,95 | £43.99**

### Mathematical Analysis I

**V. A. Zorich,** Moscow State University, Russia

This softcover edition of a very popular two-  
 volume work presents a thorough first course in  
 analysis, leading from real numbers to such  
 advanced topics as differential forms on  
 manifolds, asymptotic methods, Fourier,  
 Laplace, and Legendre transforms, elliptic  
 functions and distributions.

2009. XVIII, 578 p. (Universitext) Softcover  
 ISBN 978-3-540-87451-5 ► **€ 39,95 | £31.99**



### Ordinary and Partial Differential Equations

**With Special Functions, Fourier Series, and Boundary Value Problems**

**R. P. Agarwal,** Florida Institute of Technology,  
 Melbourne, FL, USA; **D. O'Regan,** National  
 University of Ireland, Galway, Ireland

This book provides a genuine treatment of ODEs  
 and PDEs aimed mainly towards applications. It  
 explains mathematical concepts with clarity and  
 rigor, using fully worked-out examples and  
 helpful illustrations.

2009. Approx. 400 p. 35 illus. (Universitext)  
 Softcover  
 ISBN 978-0-387-79145-6 ► **€ 42,95 | £33.99**

### Mathematical Analysis II

**A. Zorich,** Moscow State University, Russia

2009. XV, 688 p. (Universitext) Softcover  
 ISBN 978-3-540-87453-9 ► **€ 39,95 | £31.99**

**Easy Ways to Order for the Americas ► Write:** Springer Order Department, PO Box 2485, Secaucus, NJ 07096-2485, USA ► **Call: (toll free)** 1-800-SPRINGER ► **Fax:** 1-201-348-4505 ► **Email:** orders-ny@springer.com or  
**for outside the Americas ► Write:** Springer Customer Service Center GmbH, Haberstrasse 7, 69126 Heidelberg,  
 Germany ► **Call:** +49 (0) 6221-345-4301 ► **Fax :** +49 (0) 6221-345-4229 ► **Email:** orders-hd-individuals@springer.  
 com ► Prices are subject to change without notice. All prices are net prices.

014042x

### MATHEMATICS POLICY ROUND-UP

The annual meeting between the Council for the Mathematical Sciences (CMS) and the Engineering and Physical Sciences Research Council (EPSRC) took place in early December. Delegates from the CMS met with EPSRC chief executive David Delpy to discuss matters of concern to the mathematical sciences community, including support for Masters training and the level of Responsive Mode Funding available for mathematical sciences research. In particular, the CMS is concerned that the Mathematical Sciences Programme will be reduced to £14 million in 2009/10 – a sharp decrease from £16 million in 2007/08 and over £20 million just a few years ago. The CMS learnt in January that all programme budgets were to be reduced in order to direct funding towards several multi-disciplinary themes, including *Energy*, *Nanoscience* and *The Digital Economy*. The CMS–EPSRC liaison group has been working with the Mathematical Sciences Programme to discuss the implications of this shift in funding, and a series of events is planned for early 2009 to encourage researchers to engage wherever possible with these multi-disciplinary themes in order to secure funding for their research.

The EPSRC has announced 44 new Doctoral Training Centres (DTC) “to provide a supportive and exciting environment for students to carry out a challenging PhD-level research project together with taught coursework.” The new centres will each take in around 10 students per year for five years starting in 2009. The centres are based at universities around the UK, each focusing on a specific research area. However, none is explicitly mathematically focused. In further discussions with the EPSRC, the CMS has been told that the EPSRC mathematical sciences programme

will carry forward its contribution to the DTC fund and run a mathematical sciences-focused DTC call early in 2009, with money available for two centres to start in 2010. For the list of new centres, see [www.epsrc.ac.uk/PostgraduateTraining/Centres/NewCentres.htm](http://www.epsrc.ac.uk/PostgraduateTraining/Centres/NewCentres.htm).

CMS responded to an inquiry by the House of Commons’ *Innovation, Universities, Science and Skills* Select Committee into Students and Universities. It said that although the mathematics A-level was doing ‘a reasonable job’ it fails to distinguish between high-achieving students. The response expressed serious concerns about whether the proposed science and engineering diplomas sufficiently prepared students for entry to mathematical-science degree courses. It told the Committee that cuts to the mathematical sciences programme budget by the EPSRC is a cause for concern, as is the low level of the Hefce unit of resource for mathematics. The response also called for improved teacher training for mathematicians in UK universities as well as commenting on the effects of the Research Assessment Exercise upon the mathematical sciences. To read the submission see the Policy section of the LMS website [www.lms.ac.uk](http://www.lms.ac.uk).

The LMS and the Institute of Mathematics and its Applications teamed up with the Heads of Departments of Mathematical Sciences to congratulate UK mathematical sciences departments on their impressive ratings in the 2008 Research Assessment Exercise. This year, departments received an ‘overall quality profile’ which assessed the proportion of their staff who fell into the categories 4\* (world-leading), 3\* (internationally excellent), 2\* (recognised internationally), 1\* (recognised nationally) and Unclassified (below nationally recognised). The three organisations were

delighted to see that the UK mathematical sciences base was recognised as internationally excellent. Funding decisions based on the results of the exercise (which is expected to be the last in the current format, to be replaced by the Research Excellence Framework) will be made in March 2009. For more information and for full results see [www.rae.ac.uk](http://www.rae.ac.uk). For the LMS-IMA-HoDoMS statement see the *News* section of the LMS website [www.lms.ac.uk](http://www.lms.ac.uk).

The Government has unveiled plans for the introduction of a double-award GCSE in mathematics. The Qualifications and Curriculum Authority will start piloting a new course from September 2010. The Department for Children, Schools and Families said, "The GCSE twins will cover the rigorous core programme of study included in the single award. They will also give a broader grounding in pure and applied maths – allowing students to see how maths works in the real world, and also to engage in more abstract thinking. One GCSE will focus on applications of mathematics in everyday contexts including financial applications; the other will focus on problem solving within mathematics." If successful, the double course will be rolled out in 2015. At the same time, awarding bodies will update the single GCSE for 2010 to "help students develop confidence in maths and inspire them to progress to further learning". The Advisory Committee on Mathematics Education, which advised the government during the development of the plans, welcomed the announcement but warned that the timescale is not ideal. For ACME's statement see [www.acme-uk.org](http://www.acme-uk.org). For the LMS-IMA joint response see the *News* section of the LMS website at [www.lms.ac.uk](http://www.lms.ac.uk).

Caroline Davis  
Mathematics Policy and Promotion Officer

## WORKING WITH EPSRC TO COMMUNICATE RESEARCH

EPSRC has produced a set of three leaflets outlining the communications support available to researchers. The series covers general communication and publicity through to more involved aspects of public engagement. The new leaflets aim to clarify communications issues and alert researchers to the help and advice EPSRC can provide. If you would like copies of these leaflets or have any queries relating to communications activities contact Gemma Hulkes ([gemma.hulkes@epsrc.ac.uk](mailto:gemma.hulkes@epsrc.ac.uk)).

*Public Communication Training* – promotes the Public Communication Training Fund (PCTF), which is available to all researchers when applying for funding. This fund is an optional, additional sum of money attached to research grants, which is made available to promote the spread of communications skills through the research community.

*How We Communicate* – provides information on how EPSRC can help you promote your research findings, through EPSRC's press office and your university press office; through our corporate publications, promotional material and events; and through the EPSRC website.

*Public Engagement* – provides details of EPSRC's Public Engagement Programme and how you can get involved, from taking part in science and engineering festivals to holding a Partnerships for Public Engagement award or even becoming a Senior Media Fellow.

## LIMS EVENING LECTURE

The next Lighthill Institute of Mathematical Sciences (LIMS) Evening Lecture will be given by Philip Bond and Mike Wiltshire on *Cloaking: Windturbines, Invisible Aircraft & Microwaves*. It will take place at De Morgan House, Russell Square on 24 February 2009 commencing at 17.30. For further information visit the website [www.ucl.ac.uk/lms/events.htm](http://www.ucl.ac.uk/lms/events.htm).



## Cecil King Travel Scholarship

The London  
Mathematical  
Society



The London Mathematical Society annually awards a £5000 Cecil King Travel Scholarship in Mathematics to a young mathematician of outstanding promise. The Scholarship is awarded to support a period of study or research abroad, typically for a period of three months.

The award is competitive and based on a written proposal describing the intended programme of study or research abroad and the benefits to be gained from such a visit. A shortlist of applicants will be selected for interview.

Applicants should normally be nationals of the UK or Republic of Ireland, either registered for or having recently completed a doctoral degree at a UK University.

Applications should be made using the form available on the Society's website ([www.lms.ac.uk/activities/cecil\\_king/index.html](http://www.lms.ac.uk/activities/cecil_king/index.html)) or from Antony Bastiani at the Society ([antony.bastiani@lms.ac.uk](mailto:antony.bastiani@lms.ac.uk)). The closing date for applications is **Friday 20 February 2009**. It is expected that interviews will take place in London in late April or early May.

*The Cecil King Travel Scholarship was established in 2001 by the Cecil King Memorial Fund. The award is made by the Council of the London Mathematical Society on the recommendation of the Cecil King Prize Committee, nominated by the Society's Education Committee.*



**EPSRC**The London  
Mathematical  
Society

## FACILITATOR FOR THE SHORT INSTRUCTIONAL COURSES IN MATHEMATICS

The Society is seeking to appoint a Facilitator for the Short Instructional Courses, run under a contract with the EPSRC, to succeed Professor Alan Camina. The Facilitator is responsible for:

- a) consulting widely and bringing forward suggestions of topics for Short Courses to the Research Meetings Committee and organising and administering the refereeing system for proposals;
- b) recruiting organisers for Short Courses, advising on the preparation of the scientific case and liaising with the local conference organisers at the chosen sites;
- c) working with De Morgan House staff on aspects relating to publicity, participation and organisation of the short courses;
- d) advising on the budget of each Short Course, providing the Research Meetings Committee with an assessment of each course and ensuring that the terms of the contract with EPSRC are met.

The post is part time, one day per week, normally working from home or an existing institution. Some attendance at meetings in London is required. For further information and to discuss the position, please contact Peter Cooper, Executive Secretary (email: [peter.cooper@lms.ac.uk](mailto:peter.cooper@lms.ac.uk); tel: 020 7291 9970).

9

## BAKERIAN PRIZE LECTURE

The Royal Society Bakerian Prize Lecture will be given by Professor James Murray, FRS, University of Oxford, on *Mathematics in the Real World: From Brain Tumours to Saving Marriages* at 6.30 pm on Thursday 26 March 2009.

This lecture is free – no ticket or advanced booking is required. Doors open at 5.45 pm and seats will be allocated on a first-come-first-served basis. This lecture will be webcast live at [royalsociety.org/live](http://royalsociety.org/live) and available to view on demand within 48 hours of delivery.

**Abstract.** *Practical mathematical models are becoming an accepted part of most medical and scientific disciplines. They cover an ever-expanding spectrum of topics. A few of the more unlikely applications are justifying intertribal warfare, the benefits of cannibalism, how the leopard gets its spots, how sex determination in crocodiles has let them survive and demonstrating the connection between badgers and bovine tuberculosis. This lecture will describe the modelling of two applications; brain tumours and the rise in divorce rates.*

### VISIT OF PROFESSOR J. RATCLIFFE

Professor John Ratcliffe (Vanderbilt University, Tennessee) will be visiting Durham, Warwick and York Universities from 1 to 12 March 2009. He is a specialist in low-dimensional topology and geometry. During his visit he will give four talks:

- Wednesday 4 March, University of York, contact Brent Everitt (bje1@york.ac.uk)
- Thursday 5 March, University of Warwick, contact Brian Bowditch (B.H.Bowditch@warwick.ac.uk)
- Friday 6 March, University of Warwick, contact Brian Bowditch (B.H.Bowditch@warwick.ac.uk)
- Tuesday 10 March, University of Durham, contact John Parker (j.r.parker@durham.ac.uk)

For further details contact Brent Everitt (bje1@york.ac.uk). The visit is supported in part by an LMS Scheme 2 grant.

### VISIT OF DR I. VESELIĆ

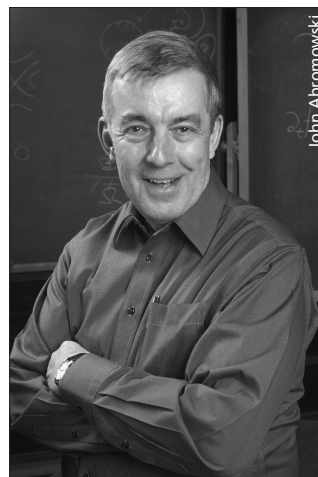
Dr Ivan Veselić (Technische Universität Chemnitz, Germany) will be visiting the UK during March. His research interests are in Mathematical Physics, in particular in the theory of random Schrödinger operators. During his visit he will give four talks:

- Monday 9 March, University of Bristol *Geometric and spectral properties of percolation on Cayley graphs*
  - Wednesday 11 March, University College London *Bounds on the spectral shift function and applications*
  - Thursday 12 March, Imperial College London *Percolation clusters on Cayley graphs and their spectra*
  - Monday 16 March, Durham *Bounds on the spectral shift function and applications*
- Please contact Dr N. Peyerimhoff (norbert.peyerimhoff@durham.ac.uk) for further information. This visit is supported by an LMS Scheme 2 grant.

### AMS EXECUTIVE DIRECTOR

Professor Donald E. McClure of Brown University has been named Executive Director of the American Mathematical Society (AMS). McClure succeeds Dr John H. Ewing, who has held the post for the past 13 years and who is now president of *Math for America*, a programme that aims to attract mathematically-talented young people to teach in the nation's schools.

"Don has served the Society for much of the past 13 years, first as an elected member of the Board of Trustees and then as Associate Treasurer," Ewing commented. "Don is well known and highly regarded by the AMS community," said AMS President James Glimm. "Because of his extensive knowledge of AMS affairs, we expect the transition to be smooth. Looking beyond an immediate transition period, Don brings to the AMS a level of experience with the broader world of science, technology, and business that will help our organization. His excellent judgement and taste will serve him (and us) well in this new position."



Donald E. McClure

## MATHEMATICAL SOCIETY OF JAPAN

### 2008 Prizes

The **Autumn Prize** was awarded to Masanao Ozawa (Nagoya University) for his outstanding contribution to Mathematical Foundation of Quantum Information. He has shown that Heisenberg's uncertainty principle is not physically correct and proposed the inequality which replaces the principle and proved it with mathematical rigor; he has quantitatively generalized the Wigner-Araki-Yanase Theorem and shown severe theoretical restrictions for the construction of quantum computers; he has succeeded in characterizing all physically possible observables as a measure with the values in the completely positive operators and finally solved Hilbert's 6th problem. The Autumn Prize of MSJ is awarded to a member of MSJ who has made outstanding contributions to Mathematics in the highest and broadest sense within the past five years.

The **Analysis Prizes** have been awarded to Ken-iti Sato (Nagoya University) for his contributions to the developments in the theory of Lévy processes and in particular for his work on stochastic integrals with respect to Lévy processes and infinitely divisible distributions; to Hideo Tamura (Okayama University) for his contribution to the asymptotic analysis of the spectrum arising from quantum physics and in particular for his results on the Aharanov-Bohm effect in the scattering theory and the sharp error estimate to the Trotter-Kato product formula; and to Nakao Hayahi (Osaka University) for many works on various nonlinear dispersive equations and in particular for his construction of modified wave operators for general equations of KdV type, and construction of modified scattering operators for nonlinear Schrödinger equations and nonlinear Klein-Gordon equations.

## NEWS FROM THE IMU

### Kenya has become an Associate IMU Member.

The vote on Kenya's application for Associate Membership yielded a positive result. As of October 2008, Kenya is an Associate Member of the IMU. For more information on Kenya's Adhering Organization see: [www.mathunion.org/members/countries/kenya](http://www.mathunion.org/members/countries/kenya).

**2008 Ramanujan Prize.** The 2008 Srinivasa Ramanujan Prize will be awarded to Professor Enrique R. Pujals, Instituto Nacional de Matemática Pura e Aplicada (IMPA), Brazil. The Prize is in recognition of "his outstanding contributions to Dynamical Systems, especially the characterization of robust dynamics for flows and transformations and the development of a theory of generic systems."

The Prize is supported by the Niels Henrik Abel Memorial Fund, with participation of the International Mathematical Union. For information see: <http://prizes.ictp.it/prizes/Ramanujan>.

**ICSU Booklet.** The International Council for Science (ICSU) endorses a new booklet on *Freedom, Responsibility and Universality of Science*. In the light of recent high-profile cases of scientific misconduct, the General Assembly of ICSU reaffirmed the universal values that should guide the conduct of science.

The Assembly also explicitly recognised the key social responsibilities of the scientific community as laid out in a new booklet, which will be made widely available to scientists across the world. The booklet asserts that 'all scientists have a responsibility to ensure that they conduct their work with honesty and integrity; and to ensure that methods and results are reported in an accurate, orderly, timely and open fashion.' The booklet and more on the General Assembly are available at: [www.icsu.org/3\\_mediacentre/GA\\_29.html](http://www.icsu.org/3_mediacentre/GA_29.html).

The above items are taken from the 32nd issue of the IMU electronic newsletter *IMU Net* (see [www.mathunion.org/IMU-Net](http://www.mathunion.org/IMU-Net)).

### NEWS FROM ICSU

More than 270 participants gathered in Maputo, Mozambique, from 21 to 24 October, for the 29th International Council for Science (ICSU) General Assembly (GA) – the first time an ICSU GA has been held in sub-Saharan Africa. Hosted by the Scientific Research Association of Mozambique (AICIMO) under the auspices of the Government of Mozambique and in cooperation with the ICSU Regional Office for Africa, the event was a great success, with delegates enjoying the wonderful hospitality of the local hosts.

During the Opening Ceremony, H.E. Armando Emilio Guebuza, the President of Mozambique, outlined some of the challenges facing his country due to global climate change, while Goverdhan Mehta, ICSU President (2005–08), reflected on ICSU's achievements in implementing its first ever Strategic Plan (2006–11).

#### Highlights from the General Assembly

A major new research programme, Integrated Research on Disaster Risk – the challenge of natural and human-induced environmental hazards (IRDR), will be established. The programme will be of 10 years' duration and co-sponsored by the International Social Science Council (ISSC). ICSU Members have approved a new 10-year programme, Ecosystem Change and Human Well-being (ECHW), to be sponsored jointly with UNESCO and the United Nations University (UNU).

The Assembly endorsed the booklet *Freedom, Responsibility and Universality of Science*, and the role of ICSU Members in assisting the Committee on Freedom and Responsibility in the Conduct of Science (CFRS) to carry out its work.

Based on the recommendations in a report from the *ad hoc* Strategic Committee on Information and Data (SCID), an ICSU World Data System (WDS) will be established as an Interdisciplinary Body. It will replace the World Data Centres (WDC) and the Federation of Astronomical and Geophysical Data Analysis Services (FAGS).

After considering the report from the review of the Scientific Committee on Problems of the Environment (SCOPE), Members agreed that SCOPE will cease to be an ICSU Interdisciplinary Body following a transition period of no more than two years.

The Assembly requested that the Executive Board develop, in consultation with Members, a second Strategic Plan (2012–17) for approval at the 30th General Assembly.

ICSU Members reaffirmed the need for increased involvement of social scientists in the implementation of the ICSU Strategic Plan. Members agreed that ICSU must work with the International Social Science Council (ISSC) as a key partner and requested that National Members assist in identifying social scientists to help implement ICSU's Strategic Plan.

Yuan Tseh Lee (Taipei) has been elected to take over as ICSU President in 2011. Catherine Bréchnignac (France) assumed the Presidency (2008–11) from Goverdhan Mehta (India) at the conclusion of the Assembly. A new Executive Board has been elected, with Kari Raivio (Finland) and Reiko Kuroda (Japan) serving as Vice-Presidents for the next three years. Maurice Tchuente (Cameroon) was elected Secretary-General and Hans Rudolf Ott (Switzerland) will serve as Treasurer.

The General Assembly adopted three resolutions.

- The Executive Board has been mandated to explore how ICSU Members and Interdisciplinary Bodies can work with the scientific community in Mozambique in support of the Government of Mozambique as it implements its science and technology strategy.
- ICSU will take a leadership role in developing basic principles for forward planning at all stages of research projects and programmes, for data identification, sharing, availability and long-term preservation.
- The international scientific community must make efforts to improve internet capabilities in scientific, technical and educational institutions in Africa and around the world.

## REPRESENTATIONS AND ASYMPTOTIC GROUP THEORY

A two-day workshop on *Representations and Asymptotic Group Theory* will be held from 6 to 7 April 2009 at the University of Southampton. The speakers will include:

- N. Avni (Harvard University)
- L. Bartholdi (Universität Göttingen)
- S. Goodwin (University of Birmingham)
- M. Liebeck (Imperial College London) TBC
- A. Lubotzky (Hebrew University, Jerusalem) TBC
- U. Onn (Ben Gurion University)
- A. Stasinski (University of Southampton)
- S. Stevens (University of East Anglia)

The workshop forms part of the South England Profinite Groups Meetings which are supported by an LMS Scheme 3 grant. The workshop is also funded by the School of Mathematics of the University of Southampton. Applications for financial support can be made on the registration form. For more details see [www.ma.rhul.ac.uk/representations](http://www.ma.rhul.ac.uk/representations) or contact Benjamin Klopsch and Christopher Voll ([sotonworkshop2009@googlemail.com](mailto:sotonworkshop2009@googlemail.com)).

### MAFELAP 2009

The thirteenth conference on the *Mathematics of Finite Elements and Applications* (MAFELAP 2009) will take place at Brunel University from 9 to 12 June 2009. The conference is dedicated to Mary Wheeler and John Whiteman both having reached the age of 70.

The organisers are now at the stage when they are encouraging colleagues to propose mini-symposia which they would like to organise at MAFELAP. Briefly, the parameters for a mini-symposium are that we shall allocate a time-slot to the organisers, during which they can have four speakers, each

giving a presentation (probably 30 minutes, 25 minutes talk plus 5 minutes for questions). If organisers want more than four talks, then the organisers could give them two two-hour slots. If you are interested in running a mini-symposium, submit the title to Professor Norbert Heuer ([nheuer@mat.puc.cl](mailto:nheuer@mat.puc.cl)) or Carolyn Sellers ([carolyn.sellers@brunel.ac.uk](mailto:carolyn.sellers@brunel.ac.uk)) as soon as possible, with a tentative list of speakers.

Early-bird registration is available until 2 March 2009. For further details of the conference, invited speakers, mini-symposia proposed to date and registration, visit the website at <http://people.brunel.ac.uk/~icsrsss/bicom/mafelap2009> or email [mafelap2009@brunel.ac.uk](mailto:mafelap2009@brunel.ac.uk).

More details will be added to the website as time progresses.

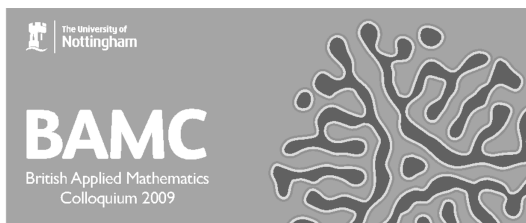
## CATEGORIFICATION AND GEOMETRISATION FROM REPRESENTATION THEORY

There will be a week-long meeting on *Categorification and Geometrisation from Representation Theory* at the University of Glasgow from 13 to 18 April 2009, funded by the Isaac Newton Institute and the International Centre for Mathematical Sciences.

The first part of the meeting (Monday to Wednesday) is instructional, with courses on relevant areas of Lie theory, symplectic geometry and algebraic geometry. The second part (Wednesday to Saturday) is a workshop (but still very instructional).

More details can be found at [www.icms.org.uk/workshop.php?id=75](http://www.icms.org.uk/workshop.php?id=75). In particular you will find out how to register. If you wish to come, and especially if you are interested in financial support, please register as soon as possible. Places and funding are limited.

The organising committee is: Ken Brown, Iain Gordon, Uli Kraehmer, Nicolai Reshetikhin, Raphaël Rouquier, Catharina Stroppel.



## BAMC 2009

6 – 9 April 2009  
Nottingham

Registration is now open for the British Applied Mathematics Colloquium 2009 (incorporating the 51st British Theoretical Mechanics Colloquium), which will be hosted by the School of Mathematical Sciences at the University of Nottingham.

We invite participation by researchers from all areas of applied and applicable mathematics; we particularly welcome contributions from postdocs and PhD students.

The conference will have a compact, three-day format, with invited plenary lectures, minisymposia, parallel sessions for contributed talks, and poster sessions beginning on Tuesday, 7 April and finishing on Thursday, 9 April. The programme will include a general interest lecture and an outreach event on Monday, 6 April.

### Confirmed Plenary Speakers

Michael P. Brenner (*Harvard University*)  
Franco Brezzi (*University of Pavia*)  
L. Pamela Cook (*University of Delaware*)  
Alain Goriely (*University of Arizona*)  
Björn Sandstede (*Brown University*)  
Jon Keating (*University of Bristol*)

### Minisymposia

Quantum Chaos & Disordered Systems ♦ Scientific Computation ♦ Cells and Networks ♦ Stochastic Systems and Uncertainty ♦ Multiphase flow in porous media ♦ Approaches to Nanofluidics ♦ Nonlinear Optics and Optical Coherent Structures ♦ Delay and Difference Equations ♦ Regenerative Medicine ♦ Mathematics Education

The closing date for registration is **13 February 2009**.

For further information, please see <http://www.bamc2009.org.uk/>.

Please send queries to [bamc@nottingham.ac.uk](mailto:bamc@nottingham.ac.uk).

Joint Meeting of the 61<sup>st</sup> British Mathematical Colloquium and  
the 22<sup>nd</sup> Annual Meeting of the Irish Mathematical Society

**National University of Ireland Galway, 6-9 April, 2009**

[www.maths.nuigalway.ie/bmc2009](http://www.maths.nuigalway.ie/bmc2009)

**Plenary Speakers**

David Eisenbud (UC Berkeley)  
Ron Graham (UC San Diego)  
Ben Green (Cambridge)  
Rostislav Grigorchuk (Texas A&M)  
Frances Kirwan (Oxford)

**Public Lecture**

Tom Körner (Cambridge)

**Special Sessions**

Analysis  
Computational Algebra

**Morning Speakers**

Jürgen Berndt (UCC Cork)  
Tony Carbery (Edinburgh)  
Rod Gow (UCD Dublin)  
Martin Kilian (UCC Cork)  
Ian Leary (Ohio)  
Tom Laffey (UCD Dublin)  
Martin Mathieu (Belfast)  
Éamonn O'Brien (Auckland)  
Lars Olsen (St Andrews)  
Hinke Osinga (Bristol)  
Reidun Twarock (York)  
Dominic Welsh (Oxford)

**Postgraduate Conference and Poster Session, April 6**

Satellite conference at Queen's University Belfast, 14-17 April 2009:  
3<sup>rd</sup> **International Workshop on Operators and their Applications**

The BMC2009/IMS is supported by the London Mathematical Society, the Irish Mathematical Society, Science Foundation Ireland and National University of Ireland Galway.



## LMS INVITED LECTURES

### *Black Holes in a Vacuum: Examples and Uniqueness Properties*

**Alexandru Ionescu (University of Wisconsin)**

**31 March – 4 April 2009**

**University of Edinburgh**

These lectures will develop the mathematical theory in General Relativity of black holes and culminate in addressing a fundamental conjecture in this area; namely that the domain of outer communication of a regular, stationary, four-dimensional, vacuum black hole is isometrically diffeomorphic to the domain of outer communication of a Kerr black hole. Research students are particularly encouraged to attend.

There will be two lectures each morning given by Professor Ionescu, who will cover the following topics:

- Lorentzian geometry: basic definitions
- The Einstein vacuum equations
- Special solutions: Minkowski, Schwarzschild, Kerr
- Stationary regular black holes
- Unique continuation: examples
- The uniqueness of the Kerr solution (3–4 lectures on this topic)

In addition to the lectures given by Professor Ionescu, there will be a few more specialised one-hour lectures on certain afternoons. Lectures will begin on Tuesday 31 March and will finish by 2 pm on Saturday 4 April.

All mathematicians are welcome to attend the lectures. There will be a registration fee of £30, payable on arrival. The registration fee will be waived for research students.

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

To express interest in taking part in the Invited Lecture Series, contact James Wright (J.R.Wright@ed.ac.uk). For further information, see [www.maths.ed.ac.uk/~wright/ionescu/](http://www.maths.ed.ac.uk/~wright/ionescu/).

# LONDON MATHEMATICAL SOCIETY

## MARY CARTWRIGHT MEETING

Friday 27 February 2009

Clare Lecture Theatre, Department of Mathematics, Imperial College London

### 3.30 Opening of the Meeting

**Simon Donaldson, FRS** (Imperial College London)

*A spectator's commentary on symplectic topology*

The talk will survey some of the developments of modern symplectic topology over the past 30 years, aimed at non-specialists. We will discuss the developments of pseudoholomorphic curve techniques, Floer homology, connections with geometric topology in 3 and 4 dimensions and the theory of complex algebraic surfaces.

### 4.30 Tea

### 5.00 Mary Cartwright Lecture

**Dusa McDuff, FRS** (Barnard College, Columbia University)

*Symplectic embeddings of 4-dimensional ellipsoids*

Gromov's celebrated nonsqueezing theorem of 1985 says that it is impossible to embed symplectically a large ball into a thin cylinder. One of the foundational results of modern symplectic topology, this led to a more or less complete solution of the 4-dimensional symplectic packing problem (which asks when a given disjoint union of balls can be symplectically embedded into another ball). However, there are many other packing problems. In this talk we discuss recent joint work with Schlenk about the constraints on embedding a symplectic ellipsoid into a ball. This leads to some intriguing elementary questions in number theory. The result has applications to constructing 6-dimensional manifolds with symplectic circle action.

The talk does not use much symplectic topology and will be accessible to graduate students and nonspecialists.

A reception and dinner will be held after the meeting. Contact Susan Oakes ([susan.oakes@lms.ac.uk](mailto:susan.oakes@lms.ac.uk)) for further information.

There are limited funds available to contribute in part to the expenses of members of the Society or research students to attend the meeting. Contact Isabelle Robinson ([isabelle.robinson@lms.ac.uk](mailto:isabelle.robinson@lms.ac.uk)) for further information.

### MATHEMATICAL NEUROSCIENCE

This three-day conference on *Mathematical Neuroscience* will take place from 23 to 25 March 2009 at the Royal Society of Edinburgh. The conference will provide an overview of the current state of research in mathematical approaches to neuroscience, bringing together both physical and life scientists. Drawing together the field in this way will allow for a critical discussion of the relevant experimental facts and of various mathematical methods and techniques that have been successfully applied to date. Importantly, it will draw attention to, and help develop, those pieces of mathematical theory which are likely to be relevant to future studies of the brain.

The meeting will consist of invited speakers

and registered participants, though will be limited to 75 people. The schedule will allow for a number of poster presentations.

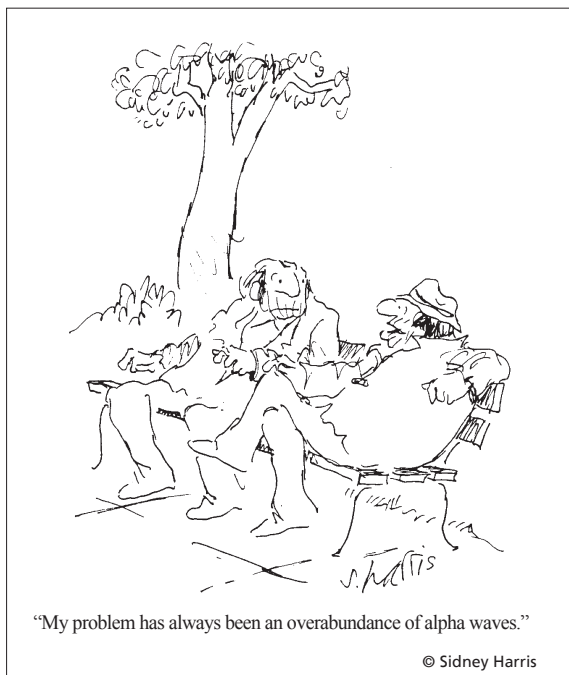
Invited speakers are:

- Ad Aertsen (Freiburg)
- Michael Breakspear (Sydney)
- Carson Chow (Bethesda)
- Geoff Goodhill (Queensland)
- Vincent Hakim (Paris)
- Viktor Jirsa (Marseille)
- Carlo Laing (Auckland)
- Peter Latham (London)
- Andre Longtin (Ottawa)
- Stefano Panzeri (Manchester)
- David Pinto (Rochester)
- Horacio Rotstein (Newark)
- Andrey Shilnikov (Atlanta)
- Dan Tranchina (New York)
- Krasimira Tsaneva-Atanasova (Bristol)
- Carl van Vreeswijk (Paris)

The registration fee for the conference is £80. A one-day training workshop for PhD students and post-docs entitled *An introduction to Mathematical Neuroscience* will also take place prior to the meeting (on 22 March). Some financial assistance is available to assist graduate students who attend **both** the training workshop and the conference.

Further details of this meeting, including how to register, may be found at <http://icms.org.uk/workshops/mathneuro2009>. The scientific organisers are Professor Stephen Coombes (University of Nottingham) and Dr Yulia Timofeeva (University of Warwick). The training workshop organiser is Dr Mark van Rossum (University of Edinburgh). Enquiries should be addressed to Irene Moore ([irene.moore@icms.org.uk](mailto:irene.moore@icms.org.uk)).

18



© Sidney Harris

## ELEMENTARY OPERATORS AND THEIR APPLICATIONS

### A Satellite to BMC2009

The third international workshop on *Elementary Operators and Applications* will be held in the Pure Mathematics Research Centre of Queen's University Belfast from 14 to 17 April 2009 as a satellite to the BMC2009, which is held jointly with the annual meeting of the Irish Mathematical Society at NUI Galway in the week before Easter. The workshop is organised by Dr Martin Mathieu and supported by the London Mathematical Society and the IMS. All information, including the list of invited speakers, can be found at <http://elop2009.awardspace.co.uk/>. Graduate Students studying at a university in the UK or RoI can receive partial support; for this and any other correspondence email [elop2009@qub.ac.uk](mailto:elop2009@qub.ac.uk).

## PAN AFRICAN CONGRESS OF MATHEMATICIANS

The 7th Pan African Congress of Mathematicians (PACOM) on *New trends in the Development and the applications of Mathematical Sciences* will be held from 3 to 8 August 2009 at the Félix Houphouët Boigny Foundation for Peace Research in Yamoussoukro, Côte d'Ivoire. Well-known teachers and researchers will give up-to-date overviews on mathematical sciences and indicate new research trends at the theoretical level as well as their applications to Computer Science, Biology, Physics, Economy, Engineering Sciences, Industry, etc. All fields of mathematics and their subdivisions in the sense of the mathematics subject classification MSC 2000 will be covered, as well as topical issues in Mathematical Education and Popularization. The academic activities will include:

- Plenary sessions delivered by outstanding mathematicians invited to bring out the recent achievements in the Mathematical Sciences and show current research trends

- Parallel sessions given by invited lecturers on their own research works
- Communications given by the participants in various specialised areas
- Posters
- Exhibition of books and didactic materials

The Pan African Congress of Mathematicians is open to all mathematicians from Africa and the other continents. African mathematicians from the Diaspora are particularly encouraged to participate actively at this Congress. The registration fee is US\$80. Those willing to participate should apply by sending their *Curriculum Vitae* and the abstract of their communication to one of the following: Professor Abderrhman Boukricha, AMU President; Département de Mathématiques, Faculté des Sciences de Tunis, Université de Tunis El Manar, BP 63, 1013 Tunis, Tunisia ([aboukricha@sft.rnu.tn](mailto:aboukricha@sft.rnu.tn)); Professor Nouzha El Yacoubi, AMI Secretary General; Département de Mathématique et Informatique, Faculté des Sciences de Rabat, Université Mohammed V, Rabat Agdal, BP 1014, Rabat, Morocco ([nelyacoubi@fsr.ac.ma](mailto:nelyacoubi@fsr.ac.ma)); Professor Etienne Desquith, Secretariat Coordinator; IRMA, Université de Cocody, 08 BP 2030, Abidjan 08, Ivory Coast ([desquith@hotmail.com](mailto:desquith@hotmail.com)).

### General Assembly

The African Mathematical Union (AMU) Ordinary General Assembly will be held on Sunday 2 August 2009, at which will proceed the renewal of the AMU Executive Committee through the election of the President, the Secretary General, the Treasurer and the five Vice-Presidents for the five geographic regions (North Africa, Southern Africa, Central Africa, East Africa and West Africa).

### Pan African Mathematical Olympiads

Preceding the Congress will be the 19th Pan African Mathematical Olympiads (PAMO), a competition of excellence among the High School boys and girls of African countries. The results will be proclaimed during the opening ceremony of the Congress.

### BRITISH COMBINATORIAL CONFERENCE

Registration is now open for the 22nd British Combinatorial Conference, to be held at the University of St Andrews from 5 to 10 July 2009. The invited speakers are:

- Arrigo Bonisoli (Università di Modena e Reggio Emilia, Italy)
- Peter J. Cameron (Queen Mary, University of London, UK)
- Willem H. Haemers (Tilburg University, The Netherlands)
- Gholamreza B. Khosrovshahi (IPM, Iran)
- Alexandr V. Kostochka (University of Illinois at Urbana-Champaign, USA)
- Daniela Kuhn (University of Birmingham, UK)
- Marc Noy (Universitat Politècnica de Catalunya, Spain)
- Oliver Riordan (University of Oxford, UK)
- Gordon Royle (University of Western Australia)

The speakers above will each give a one-hour talk. These talks are intended to be accessible to postgraduate students, postdoctoral fellows and researchers in all areas of combinatorics. In addition, participants are invited to give a talk of 20 minutes on any combinatorial topic. A problem session will be held on the last day.

There will be a wide-ranging social programme, including a conference banquet, an excursion and a musical evening. The conference and accommodation will be at the University of St Andrews. There is a discounted registration fee for postgraduate students and retirees.

A limited amount of financial support is possible for delegates from LMS Scheme 5 countries and towards the travel costs of UK-based postgraduate students. The deadline for applications for postgraduate travel support and LMS Scheme 5 support is **1 March 2009**, and the early bird discount cut-off date is **1 April 2009**. The deadline for submission of title and abstract for contributed talks is

**1 June 2009**, while the deadline for registering, paying for, and booking accommodation at the conference is **15 June 2009**.

For further information visit the website <http://bcc2009.mcs.st-and.ac.uk> or email [bcc2009@mcs.st-and.ac.uk](mailto:bcc2009@mcs.st-and.ac.uk). The organising committee is: Sophie Huczynska, James Mitchell and Colva Roney-Dougal.

### GEOMETRIC ASPECTS OF DISCRETE AND ULTRA-DISCRETE INTEGRABLE SYSTEMS

As part of the Isaac Newton Institute Programme on *Discrete Integrable Systems* (19 January to 3 July 2009) there will be a satellite workshop from 30 March to 3 April 2009 on *Geometric Aspects of Discrete and Ultra-Discrete Integrable Systems* to be held in Glasgow. The organisers are Claire Gilson, Christian Korff and Jon Nimmo (Glasgow) and Orlando Ragnisco (Roma Tre).

The intention is to bring together different communities of researchers working on classical and quantum aspects of integrable systems as well as experts on combinatorial representation theory and crystals. The scientific programme we envisage at this stage has three strands:

- Birational Yang–Baxter maps, tropical  $R$ -matrices and geometric crystals
- Cellular automata, box and ball systems, combinatorial  $R$ -matrices and crystal bases
- Geometry associated with discrete integrable systems

Invited speakers and participants include:

- Arkady Berenstein (University of Oregon)
- Alexander Bobenko (Technische Universität Berlin)
- Vyjayanthi Chari (University of California at Riverside)
- Rei Inoue (Suzuka University of Medical Science)
- Kenji Kajiwara (Kyushu University)
- Toshiki Nakashima (Sofia University, Tokyo)

- Masato Okado (Osaka University)
- Junkichi Satsuma (Aoyama Gakuin University)
- Anne Schilling (University of California, Davis)
- Tomoyuki Takenawa (Tokyo University of Marine Science & Technology)
- Tetsuji Tokihiro (The University of Tokyo)
- Alexander Veselov (Loughborough University)
- Robert Weston (Heriot-Watt University)
- Ralph Willox (The University of Tokyo)
- Yasuhiko Yamada (Kobe University)

For further information visit the website at [www.gla.ac.uk/departments/mathematics/research/isamp/events/gadudis](http://www.gla.ac.uk/departments/mathematics/research/isamp/events/gadudis). The workshop has funding from EPSRC, LMS, the Sasakawa Foundation and the University of Glasgow.

## VARIATIONAL ANALYSIS AND APPLICATIONS

The 51st workshop on *Variational Analysis and Applications* in memory of Ennio De Giorgi will take place in Erice, Sicily, from 9 to 17 May 2009. The workshop aims at presenting the state of the art and current research directions in variational analysis and its applications. Variational analysis encompasses a large area of modern mathematics, including the classic Calculus of Variations, the Theories of Perturbation and of Approximation, Generalized Differentiability, Set Convergence and Variational Inequalities. In many of these fields, Ennio De Giorgi gave outstanding contributions and techniques, and research directions indicated by him had an enormous impact. He worked both in theory and applications of Variational Analysis, covering a wide class of problems (regularity of solutions to partial differential equations, minimal surfaces, homogenization, measure theory, foundations of Mathematics, generalized limits).

The third Gold Medal 'Guido Stampacchia' Prize will be awarded on 10 May to a researcher, less than 35 years old, who has done outstanding research in the field of Variational Analysis and its applications. Nominations must

be sent by **28 February 2009** to Unione Matematica Italiana, Dipartimento di Matematica, Piazza di Porta San Donato 5, 40126 Bologna, Italy. The first and second winners of the 'Guido Stampacchia' were T. Riviere and G. Mingione.

A provisional list of invited speakers is: G. Buttazzo, X. Cabré, V. Caselles, G. Dal Maso, P. Daniele, C. De Lellis, V. Demyanov, A. Figalli, A. Ioffe, A. Mellet, B. Mordukhovich, L. Qi, A. Quarteroni, S. Salsa, C. Sbordone, S. Serfaty, P. Souganidis, S. Terracini, M. Théra, N.S. Trudinger. The proceedings of the conference will be published in an international journal.

Those wishing to attend the workshop and/or deliver a short communication should apply in writing to: Professor Antonino Maugeri, Department of Mathematics and Computer Science, University of Catania, Viale A. Doria 6, 95125 Catania, Italy ([maugeri@dmf.unict.it](mailto:maugeri@dmf.unict.it)).

## POSTGRADUATE OPEN DAY Loughborough University

The Department of Mathematical Sciences of Loughborough University is holding an Open Day for all prospective MSc, MPhil and PhD students on Wednesday 25 February 2009. Areas of possible supervision at Loughborough include various aspects of *Nonlinear Waves, Diffraction Theory, Integrable Systems, Geometric Analysis, Mathematical Biology, Hamiltonian Dynamical Systems, Materials Modelling, General Relativity, Differential Geometry, Stochastic Analysis and Mathematical Education*. Taught MSc courses are also available in *Industrial Mathematical Modelling, Mathematical Processes in Biology* and *Mathematical Processes in Finance*.

Details can be found on the web ([www.lboro.ac.uk/departments/ma/admissions/pginfo/openday.html](http://www.lboro.ac.uk/departments/ma/admissions/pginfo/openday.html)). All enquiries should be addressed to Professor E.V. Ferapontov, Department of Mathematical Sciences, Loughborough University (tel: 01509 223309, email: [E.V.Ferapontov@lboro.ac.uk](mailto:E.V.Ferapontov@lboro.ac.uk)).

## RECORDS OF PROCEEDINGS AT MEETINGS

### ORDINARY MEETING

held on *Friday 12 and Saturday 13 December 2008*, jointly with the Edinburgh Mathematical Society, at the University of Edinburgh. Over 75 members and visitors were present for all or part of the meeting.

The meeting was opened at 2.45 pm by the Edinburgh Mathematical Society President, Professor R.J. ARCHBOLD. The Vice-President of the London Mathematical Society, Professor F.A. ROGERS, then assumed the Chair for the Society's business meeting. Six people were elected to Ordinary Membership of the London Mathematical Society: I. Biza, P. Iannone, M.R. Muldoon, M. Neklyudov, J. Niesen and D.J. Rule; two people were elected to Associate Membership: T.N. Ta and J.M. Taylor; and one person was elected to Reciprocity Membership: J. Wolf (American Mathematical Society).

The Records of the Proceedings of the Society Meetings held on 17 July and 15 September 2008 were signed as correct records.

One member signed the Membership Book and was admitted to the Society.

Professor Rogers invited the Programme Secretary of the London Mathematical Society, Dr S.A. HUGGETT, to say a few words about the work of the Society's Administrator, Miss Susan Oakes, in organizing its Meetings. Professor Rogers then concluded the business meeting of the London Mathematical Society.

Professor Archbold then chaired the business meeting of the Edinburgh Mathematical Society, starting with the presentation of a gift from the Society to Susan Oakes in recognition of her work.

Professor S.E. REES introduced a lecture given by Alain Valette on *The Haagerup property and its stability properties*. After tea, Professor I.G. GORDON introduced a lecture given by Efim Zelmanov on *Asymptotic properties of finite groups and finite-dimensional algebras*. A reception was then held in the School of Mathematics followed by a dinner at St Trinnean's Room, St Leonard's Hall, Pollock Halls.

On Saturday Professor R.M. THOMAS introduced a lecture given by Laurent Bartholdi on *Automatically presented groups*. After coffee, Professor J. HOWIE, FRSE, introduced a lecture given by Martin Bridson on *Dimension, rigidity and fixed-point theorems*.

Professor Rogers expressed the thanks of the London Mathematical Society to the Edinburgh Mathematical Society, to the School of Mathematics for hosting the reception on Friday evening, to the organizers of the two-day meeting for putting on such an excellent meeting, and to the speakers.

Professor Archbold then closed the meeting.



## LMS ADMINISTRATOR

Susan Oakes

*Tribute given by the Programme Secretary at the joint meeting with the Edinburgh Mathematical Society on 12–13 December 2009.*

It is an honour and a pleasure to have been asked to say a few words about Susan's work in making our Society Meetings, and particularly joint ones such as this, such a great success over the years. One of her many tasks is to write a script for anyone, such as a President or Vice-President, chairing a Society Meeting: she does not trust us to do this task unaided! So when Alice departed from the script just now Susan knew immediately what was coming. Don't worry Susan, I will not go out of my way to embarrass you, tempting though that is.

Of course there are very many things which have to be done in preparation for any of these events, and these scripts are merely one example of Susan's attention to detail, and her care for and dedication to the LMS. Susan also helps Programme Committee to prepare the Hardy Lectures, the Invited Lectures, and the Spitalfields Days, as well as working very hard on the *Newsletter*, and generally looking after our members.

This brings me back to the Society Meetings, especially those held abroad, such as at the ICM in Madrid. It is quite amazing to see how many mathematicians bounce up to the LMS stand at our meetings to greet Susan as an old friend. This is all the more impressive because Susan's job title is Administrator, and our university administrators have subjected us to such a tidal wave of bull in recent years that it is rare for us to feel any warmth towards them! Yet Susan knows more mathematicians than any of us, and what is more she

is held in great affection and esteem by them. She has helped the LMS to build up an enormous fund of goodwill, which in my view should not be squandered.

I do not know how to thank her enough. On behalf of all my predecessors as Programme Secretary, all members of Programme Committee down the years, and all mathematicians who have ever enjoyed one of Susan's Society Meetings, I can only hope that Susan can see that we feel our debt to her, and we acknowledge it.

S.A. Huggett

## JOINT LMS–EMS MEETING ON GROUP THEORY

12–13 December 2008

23

A joint meeting of the London and Edinburgh Mathematical Societies on *Group Theory* was held at the University of Edinburgh, rounding off a three-day Workshop on *Infinite Group Theory*. After short business meetings for each Society, the EMS President, Rob Archbold, presented Susan Oakes with some Edinburgh Crystal glassware to show the EMS's appreciation for her work in organising many joint meetings over the past 27 years.

Alain Valette (Neuchâtel) then delivered a lecture entitled *The Haagerup property and its stability properties* with the underlying theme of how groups act by isometries on a Hilbert space viewed as a metric space. He introduced the Haagerup property and the (near complementary) property (FH) for a group  $G$ , giving various examples and properties of such groups. There followed a discussion of the permanence properties of the Haagerup property and in particular the recent result of de Cornulier, Stalder and the speaker that the Haagerup property is stable under wreath products.

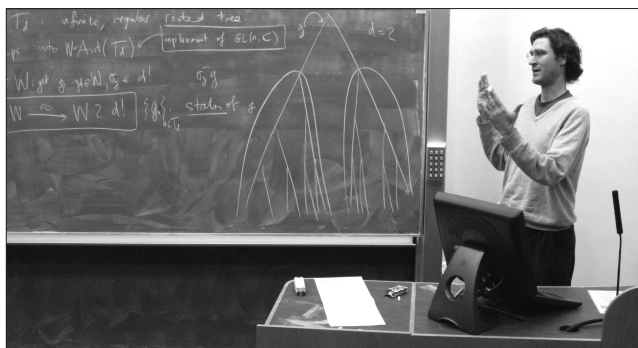
After tea, Efim Zelmanov (San Diego) spoke on *Asymptotic properties of finite groups and finite-dimensional algebras*. Within the context of the growth of groups, the speaker considered which residually finite groups  $G$  are such that the Cayley graphs of their finite homomorphic images are  $k$  regular  $\varepsilon$ -expanders for fixed  $k$  and  $\varepsilon$  ( $G$  is then said to have property  $\tau$ ). Examples of Golod-Shafarevich groups were discussed leading to Ershov's counterexample showing that Golod-Shafarevich groups may have property  $\tau$ . The last part of the talk concerned expanders for algebras where there is an analogous definition of  $\varepsilon$ -expander in terms of a set of  $m$  endomorphisms, growth being measured by the Gelfand-Kirillov dimension of the algebra. Lubotzky and the speaker recently showed that a family of  $\varepsilon$ -expanders for a fixed  $\varepsilon$  and  $m$  exists for any field of characteristic zero, but the case of finite characteristic remains unresolved.

On Friday evening about 60 members of the two societies and guests attended a dinner in the St Trinnean's Room, with its splendid painted ceiling and carved fireplace. (The Room is part of a former school that inspired a certain fictional institution of a similar name.)

First to speak on Saturday morning was

Laurent Bartholdi (Göttingen) on *Automatically presented groups*. Discussing ways of describing 'interesting' infinite groups, he pointed out that representations by matrices and presentations both had drawbacks; for example wreath products are rarely finitely presented. Automatically presented groups provide an attractive alternative, where groups are defined by a finite state automaton and represented by a subgroup of the automorphism group of the infinite  $d$ -regular rooted tree. Examples include Grigorchuk's group. Such automatic constructions are motivated by dynamical systems where the data for the automatic presentation is a perfect invariant for the system. The talk concluded with two open problems: does a finitely automatically presented group have solvable word problem, and in a rationally presented group (where the word problem is solvable) can one effectively compute the order of elements?

The final talk, by Martin Bridson (Oxford) on *Dimension, rigidity and fixed-point problems*, began with two basic propositions. A metrical result: if a finite group  $G$  acts by isometries on  $\mathbb{R}^n$  then  $G$  has a (global) fixed point; and a topological result: if  $p$  is prime and  $\mathbb{Z}_p$  acts by homeomorphisms on  $\mathbb{R}^n$  then there is a fixed point. With the aim



Laurent Bartholdi



Martin Bridson

of generalising such results, the talk surveyed the concepts of rigidity and superrigidity, property FA from Bass–Serre theory and extensions to complexes of groups. The talk culminated in three theorems due to the speaker and co-workers. Firstly, if  $m < n$  then  $SL(n, \mathbb{Z})$  has no non-trivial action on either  $\mathbb{R}^m$  or  $S^{m-1}$  (nor on certain other manifolds). Secondly, writing  $X_{ac}$  for the finite-dimensional Hausdorff spaces that are mod- $p$  acyclic for some prime  $p$ , there exists a finitely generated group  $Q$  which has a fixed point whenever it acts on any space of  $X_{ac}$ . Finally, the least dimension of a CAT(0) space on which  $SL(n, \mathbb{Z})$  can act without a fixed point is at least  $n$  (with similar results for other groups).

Kenneth Falconer  
University of St Andrews

additive combination of colours (as opposed to the subtractive mixing of pigments) that led to the first colour photograph – by Maxwell. The great man is shown late in his short life (he died of stomach cancer aged 48), and lost in thought, clearly miles away from the colour wheel. One might hope that his mind was on some point of electromagnetic theory, but it could have been on how much time he had left, or on the other hand on some practical matter concerning the Cavendish Laboratory in Cambridge, which he had established as the first Cavendish professor. *Guardian* readers will have noticed in the 21 November edition a magnificent double-page photograph of the statue in the foundry where it was cast. In the photo the man holding the plaster cast of the dog that sits at Maxwell's feet is the sculptor, Alexander Stoddart.

25

## THE JAMES CLERK MAXWELL STATUE

Sir Michael Atiyah's grand project for an Edinburgh memorial to James Clerk Maxwell came to fruition on 25 November with the unveiling of a new statue commissioned for a superb site in the New Town. The LMS had contributed financially to the venture, so our President Brian Davies was invited to the unveiling and the one-day conference associated with it. To his regret Brian had a previous engagement, and the honour of representing our Society in his place passed to me. My paternal grandmother was born Mary Maxwell, so I had some family interest in the event, despite not knowing of any genealogical link with the Clerk Maxwells.

The statue is a bronze of almost twice life size, showing a seated Clerk Maxwell holding his colour wheel, which demonstrated the



Statue of J. Clerk Maxwell

# THE LONDON MATHEMATICAL SOCIETY

## NEWSLETTER

There is more to the sculpture than the bronze, as it rests on a massive plinth, of granite, naturally – but Chinese granite, which arrived by ship at the granite city of Aberdeen. The long sides of the plinth sport *bas-reliefs*, one of an idealised experiment involving Newton and light, the other similarly of Einstein and gravity. Maxwell thus sits between his intellectual forerunner and his intellectual successor. Malcolm Longair, former Astronomer Royal for Scotland and more recently from the Cavendish Laboratory, advised on the scientific content of the reliefs, but the artistry, as for the bronze and the ensemble as a whole, is all down to the sculptor. One end of the plinth bears a brass plaque naming James Clerk Maxwell and describing him as Mathematical Physicist. Below is a list of major donors, including the LMS. The Society's request that Maxwell's equations be displayed has not so far been realised, but we were told on the day that a further brass plaque bearing the equations is planned, to be set below the list of donors. According to the sculptor, this was decided on artistic grounds, but I suspect that shortage of time and the danger of irredeemable error may have contributed as well, making the decision a prudent one.

The site, once occupied by a monument to Gladstone but vacant for over a hundred years, is perfect. My other grandmother would have said "it was meant". Maxwell sits at the entrance to George Street, the grandest road in the New Town. On his right at no. 1 is the original building of Standard Life, in the Ionic order. Nearby on his left is the Royal Society of Edinburgh, which hosted the Appeal and which now owns the statue and has a 999-year lease on its site. Behind Maxwell is St Andrew Square with its tall central column. In front of him are George IV, then William Pitt the younger, then Thomas Chalmers, founder of the Free Church of Scotland. Such are fitting, if mixed, company for Scotland's greatest scientist. The new statue is central and easy to find, and no mathematician in Edinburgh should miss visiting it.

The Royal Society of Edinburgh organised a one-day conference around the unveiling. Highlights for me were Malcolm Longair's talk on Maxwell's scientific achievement, and the sculptor Alexander Stoddart's lecture on his own work. The former set a new standard for how to combine enthusiasm with erudition, while the latter won over his scientific audience with a *tour de force* of learning combined with wit, ranging over the place of public art in general as well as the circumstances concerning his new statue. Proceedings of the conference are recorded in a 115-page booklet, available via [www.rse.org.uk](http://www.rse.org.uk). While £35 plus postage might seem steep for a booklet of this length, it is a handsome production and any profit will doubtless go to the RSE and possibly to the statue Appeal, as that remains open for the time being.

Charles Maxwell Goldie  
General Secretary

## REVIEWS

**The Princeton Companion to Mathematics** edited by Timothy Gowers; associate editors June Barrow-Green & Imre Leader, Princeton University Press, 2008; 1008 pp, cloth, £60, ISBN 978-0-691-11880-2.

Once in a while a book comes along that should be on every mathematician's bookshelf. This is such a book. Described as a 'companion', this 1000-page tome is an authoritative and informative reference work that is also highly pleasurable to dip into. Much of it can be read with benefit by undergraduate mathematicians, while there is a great deal to engage professional mathematicians of all persuasions. The 200 entries were written by over one hundred contributors, selected for their expertise and expository skill.

The companion is organised in eight parts. Part I is a masterly introduction, presumably written by the editors, explaining the nature

of modern mathematics, its language and grammar, and describing some of the main concepts and subject areas of mathematics (such as vector spaces, limits and hyperbolic geometry). This is followed, in Part II, by a historical overview, organised thematically in seven sections.

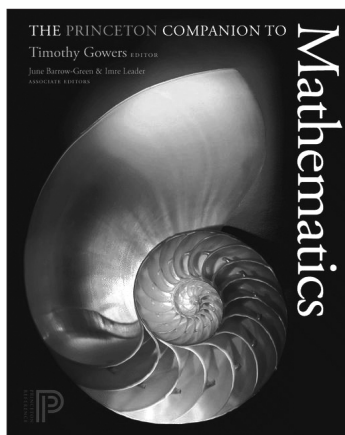
The core of the book is in the next two parts. In Part III about a hundred mathematical concepts are described in some detail, ranging from the axiom of choice, braid groups and Calabi–Yau manifolds, via elliptic curves, Jordan normal form and the Mandelbrot set, to matroids, Ricci flow and the Schrödinger equation. These feed into more substantial accounts in Part IV of twenty-six subject areas (such as analytic number theory, harmonic analysis, operator algebras and computational complexity); these take up about one-third of the book.

Part V presents descriptions of thirty-five important theorems and problems, old and new, ranging from the insolubility of the quintic and the prime number theorem to Gödel’s theorem, the Atiyah–Singer Index Theorem and the Birch–Swinnerton-Dyer conjecture.

Part VI presents mini-biographies, written by experts, of almost one hundred mathematicians, organised chronologically by birth date from Pythagoras to Bourbaki.

Part VII describes the influence of mathematics in such areas as biology, traffic flow, finance, cryptography, and the relationships between mathematics and music.

The book concludes in Part VIII with essays on general topics (such as problem solving, experimental mathematics, numeracy, and advice to a young mathematician) and a useful chronology of mathematical results and events.



The above outlines show that this is far from being a traditional encyclopedia of mathematics, but they can only hint at the enormous range of topics covered within its pages. As well as the usual mainstream topics, a welcome feature is the serious attention paid to such topics as the history of mathematics and combinatorics that are so often relegated to the sidelines or treated in an unscholarly manner. Although the

line had to be drawn somewhere – for example, there is no discussion of mathematics education – the editors have done a fine job in embracing an impressively wide selection of important and interesting topics.

Finally, the publishers should also be congratulated on the high quality of the presentation. The print is easy to read, the paper is of high quality, the diagrams are clear, and the cost of the book, given its size, is remarkably low.

Robin Wilson  
The Open University

**Strange Attractors: Poems of Love and Mathematics** by Sarah Glaz and JoAnne Growney (editors); A.K. Peters, Wellesley, Massachusetts, 2008, 196 pp, £32.50, US\$39.00, ISBN 978-1-56881-341-7.

It would seem a tall order to be asked to compile a substantial collection of ‘poems of love and mathematics’. However this challenge has been successfully taken up by Sarah Glaz and JoAnne Growney: their anthology *Strange Attractors* contains 196 pages of poetry by about 150 poets. The oldest poems are by Solomon (c. 1000–928 BC) and Catullus (84–54 BC); but the bulk of the collection features writers from the eleventh to the

twenty-first century AD – some with well-established poetic credentials (such as Dante, Emily Dickinson or Philip Larkin) and some rather surprising ‘occasional’ poets like James Clerk Maxwell. Assembling such a diverse collection must have been a major task for the editors; and the extent of their literary research is also demonstrated by the inclusion of useful biographical notes on the poets and on many of the mathematicians who are mentioned. Some poems also carry explanatory footnotes.

The mathematical content of the poems is quite varied. Some involve little more than simple enumeration – as in the Catullus poem about counting a lover’s kisses. Some employ familiar mathematical words like ‘equation’ or ‘ratio’ (sometimes without much insight) in otherwise conventional love lyrics. There are more adventurous pieces like those by Jonathan Coulton or Ed Seykota which attempt to re-write Mandelbrot set mathematics in words arranged like a poem. One of the most unusual offerings is Carl Andre’s *On the sadness* which sets out a number of phrases in patterns governed by prime factors of the integers up to 47: the result is surprisingly endearing and wistful. The poems which seem to me to work best, however, are those which start with one (possibly quite simple) mathematical idea and work outward into emotional relationships. A good example is Yehuda Amichai’s addition of a human element to schoolbook problems about trains:

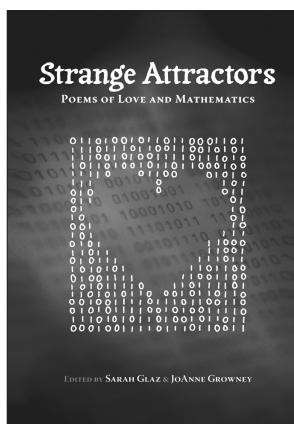
*No one ever asked what happens  
when they meet:  
will they stop or pass each other or collide?  
None of the problems was about a man  
who leaves from place A  
and a woman who leaves from place B.*

*When will they meet,  
will they meet at all and for how long?*  
More movingly, Jonathan Holden describes his father’s advancing dementia in terms of the bit-by-bit loss of algebraic symbols:  
*...The letter A  
has bought the farm. Cn w thnk?  
Oops, there goes U. It’s confsing.  
Now O. Hw cn we cry...*

This seems primarily a book for mathematicians with an interest in poetry. However it may not carry them much further into poetry than they have already travelled. Although there are some fine and serious poets represented, the arrangement of the collection (alphabetically by author within three rather arbitrary sections) makes its reading rather an uneven experience, with complex and thoughtful poems being sometimes followed by short humorous conceits. Poetry-lovers without much knowledge of mathematics may find this rather disconcerting and be inclined to doubt whether much light is shed on connections between mathematics and poetry.

The book is handsomely produced and will probably appeal to friends and families of mathematicians as a solution to a birthday present problem. It is very much a ‘dipping-in’ volume – a bookshop browser may be delighted to stumble upon surprises such as a Venn diagram in a poem by the eminent New Zealand poet C.K. Stead or Henry Lok’s magic square poem intended for reading along diagonals as well as horizontally, like an Elizabethan form of Sudoku. In fact, a rewarding way to approach the book might be to generate pseudo-random integers  $3 \leq p \leq 198$  and enjoy the pages as they come!

M. Bartholomew-Biggs  
Hertfordshire University





ISAAC NEWTON INSTITUTE FOR MATHEMATICAL SCIENCES  
THE CARDIAC PHYSIOME: MULTI-SCALE AND MULTI-PHYSICS  
MATHEMATICAL MODELLING APPLIED TO THE HEART

20–24 July 2009

in association with the Newton Institute programme entitled  
*The Cardiac Physiome Project*  
(29 June – 24 July 2009)

**Organisers:** R.H. Clayton (Sheffield), P. Hunter (Auckland), N. Smith (Oxford), S. Waters (Oxford).

**Theme of the meeting:** This meeting will be devoted to mathematical and computational modelling of the heart from the subcellular to the whole organ level. The aim of the meeting is to emphasise how engineering and mathematical approaches coupled to physiology have advanced our understanding of cardiac function and are being used clinically in the diagnosis and treatment of heart disease.

**Scientific programme:** The scientific programme will be focused on the heart and the combination of experimental and modelling research required for developing an integrated multi-scale and multi-physics cardiac model. Sessions will be organised within the themes of:

- Multiple physiological scales: Sub-cellular, cellular, cell-to-cell communication, tissue structure and properties, whole heart structure and function
- Multiple physics: Modelling and coupling of electrical excitation, mechanical contraction, coronary blood flow and ventricular fluid dynamics
- Tools and infrastructure: The simulation, visualisation and data basing tools that are needed for integrative work by the community as a whole

**Further information and application forms** are available from: [www.newton.ac.uk/programmes/\\_CPP/cppw01.html](http://www.newton.ac.uk/programmes/_CPP/cppw01.html). Completed application forms should be sent to Tracey Andrew, Programme & Conference Secretary, Isaac Newton Institute, 20 Clarkson Road, Cambridge CB3 0EH or via email to: [t.andrew@newton.cam.ac.uk](mailto:t.andrew@newton.cam.ac.uk).

Closing date for the receipt of applications is **3 April 2009**.



ISAAC NEWTON INSTITUTE FOR MATHEMATICAL SCIENCES

THE DYNAMICS OF DISCS AND PLANETS

17–21 August 2009

in association with the Newton Institute programme entitled  
*Dynamics of Discs and Planets*  
(12 August – 18 December 2009)

**Organisers:** J. Blum (Braunschweig), C.J. Clarke (Cambridge),  
L. Hartmann (Michigan), A. Morbidelli (Nice), R.P. Nelson (London),  
G.I. Ogilvie (Cambridge), J.M. Stone (Princeton), S. Udry (Geneva),  
M.C. Wyatt (Cambridge).

**Theme of conference:** The primary aim of this conference is to bring together leading researchers from the fields of protostellar disc evolution, extrasolar planets, and planetary system formation and evolution in order to assess the current state of these closely interrelated disciplines. Discussion will focus on prospects for future progress in understanding how planets form and evolve. Specific themes that will be discussed include:

- Protostellar disc observations: structure, evolution, lifetimes
- Protoplanetary disc modelling: turbulence, radiative transfer, chemistry
- Experimental and theoretical studies of dust coagulation
- Planetesimal formation
- Terrestrial and giant planet formation theory
- Disc–planet interactions and migration
- Late-stage evolution of planetary systems
- Debris discs: observations and theory
- Observations of extrasolar planets

**Further information and application forms** are available from:  
[www.newton.ac.uk/programmes/DDP/ddpw01.html](http://www.newton.ac.uk/programmes/DDP/ddpw01.html). Completed application forms should be sent to Tracey Andrew, Programme & Conference Secretary, Isaac Newton Institute, 20 Clarkson Road, Cambridge CB3 0EH or via email to: [t.andrew@newton.cam.ac.uk](mailto:t.andrew@newton.cam.ac.uk).

Closing date for the receipt of applications is **30 April 2009**.

## CALENDAR OF EVENTS

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

### FEBRUARY 2009

**24** Michael Faraday Prize Lecture, J. Barrow, The Royal Society, London (377)

**24** LIMS Evening Lecture, London (378)

**25** Postgraduate Open Day, Loughborough (378)

**27** Mary Cartwright Meeting, London (378)

### MARCH 2009

**3** *How to be a Winner: The Maths of Race Fixing and Money Laundering*, Gresham Lecture, London (375)

**23-25** Mathematical Neuroscience Conference, Royal Society of Edinburgh (378)

**23-27** UK Graduate Modelling Week, LMS-EPSRC Short Course, Nottingham (377)

**23-27** Algebraic Lie Structures with Origins in Physics Workshop, INI, Cambridge (373)

**23-27** Quantum Discrete Integrable Systems Workshop, INI, Cambridge (377)

**26** Bakerian Prize Lecture, J. Murray, The Royal Society, London (378)

**30-2 Apr** Variational Problems in Differential Geometry Workshop, Leeds (377)

**30-3 Apr** Mathematics of Weather and Climate Prediction Meeting, Meteorological Office, Exeter (376)

**30-3 Apr** Geometric Aspects of Discrete and Ultra-Discrete Integrable Systems Workshop, Glasgow (378)

**31-4 Apr** LMS Invited Lectures, A. Ionescu, Edinburgh (378)

### APRIL 2009

**6-7** Representations and Asymptotic Group Theory Workshop, Southampton (378)

**6-9** BMC, Galway (378)

**6-9** BAMC, Nottingham (378)

**13-18** Categorification and Geometrisation from Representation Theory Meeting, Glasgow (378)

**14-17** Elementary Operators and Applications Workshop, Belfast (378)

**20-22** Atiyah80: Geometry and Physics Workshop, Edinburgh (375)

### MAY 2009

**9-17** Variational Analysis and Applications Workshop, Sicily (378)

**11-13** Mathematical Models of Collective Dynamics in Biology and Evolution Meeting, Leicester (377)

### JUNE 2009

**8-11** British-Nordic Congress of Mathematicians, Oslo (374)

**9-12** Mathematics of Finite Elements and Applications Conference, Brunel University (378)

**9-15** Algebraic Topology, Group Theory and Representation Theory Conference, Isle of Skye (376)

**15-19** Nonlinear PDE and Free Boundary Problems, Warwick

**22-26** Representation Theory and Lie Theory Workshop, INI, Cambridge (376)

**29-3 July** Discrete Systems and Special Functions Workshop, INI, Cambridge (375)

### JULY 2009

**5-10** 22nd British Combinatorial Conference, St Andrews (378)

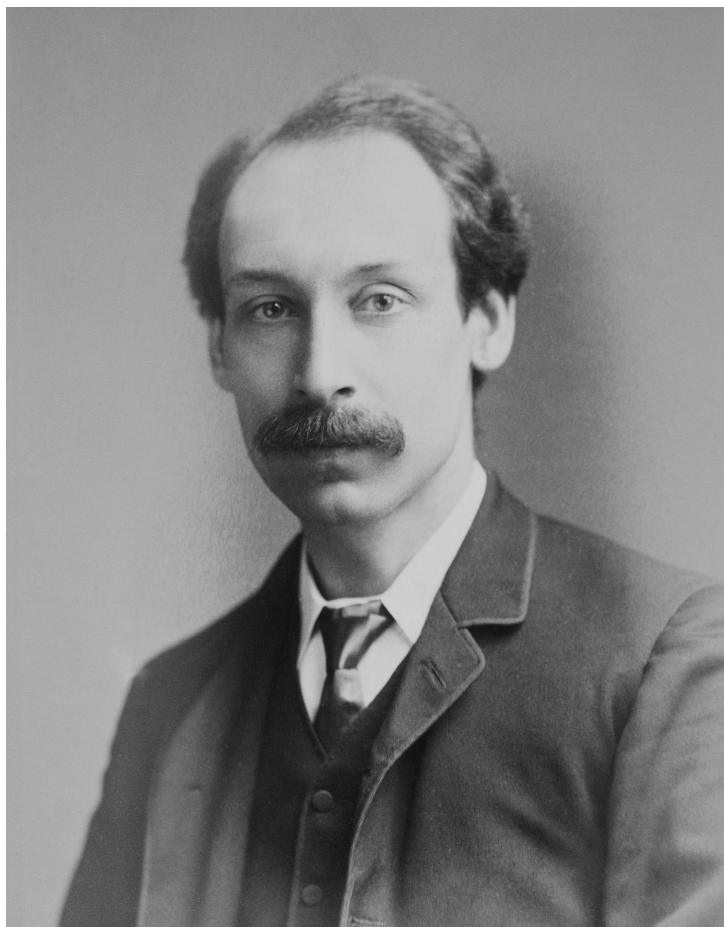
**13-18** 7th ISAAC Congress, London (377)

**15-16** Sparse Matrices for Scientific Computation Meeting, Abingdon, Oxford (377)

**20-24** The Cardiac Physiome Meeting, INI, Cambridge (378)

# M.J.M. HILL

LMS member 1883–1899



Elliott & Fry, Baker Street, London

Micaiah John Muller Hill, ScD, FRS, FCPS  
Fellow of St Peter's College, Cambridge  
Professor of Mathematics  
Member of Council of University College London