

## **NEWSLETTER**

No. 357 March 2007

## Forthcoming Society Meetings

### 2007

Friday 20 April Midlands Regional Meeting Loughborough Y. Colin de Verdière M. Gross, F. Kirwan O. Viro [*page 3*]

#### Tuesday 24 April

LMS-IMA David Crighton Lecture London E.C. Zeeman [*page 5*]

### Wednesday 30 May

SW and South Wales Regional Meeting Cardiff

### Friday 22 June

London A. Macintyre H. Woodin

### Wednesday 24 October

Northern Regional Meeting, Sheffield

### Friday 23 November AGM, London M. Struwe J.F. Toland Presidential Address

### COUNCIL DIARY 26 January 2007

At the start of the year, the first business of the Council was to welcome the new officers of the Society (Vice-President D.G. Larman, General Secretarv C.M. Goldie, Publications Secretary K.J. Falconer) and newly-elected members of Council (A.V. Borovik, D.E. Buck, S.N. Chandler-Wilde, R.M. Thomas, A.J. Wilkie). There is also a new Council Diarist, who will endeavour to maintain the high standards set by her predecessor.

As ever, much of the business of Council was either confidential in nature (and so cannot be included in the Diary) or rather formal. Amongst the more formal business of the January Council was an agreement to trial, in 2007, a reduction in the number of Council meetings, thereby saving both time and money. This was guite hotly debated at Council, but most members welcomed the reduction in the number of meetings.

An important on-going process is the examination by Council of the role of all the Society's committees. As the Treasurer sagely pointed out

"Committees rarely expedite matters" so there is a need to try and streamline processes and ensure the Society's structures are effective in executing Council policy and engaging in the Society's activities. With this in mind, Council has approved the formation of a new committee, the Research Policy Committee. Many important issues related to research policy are continually arising, such as the RAE, metrics, peer review of grant proposals, research funding, etc. At present these are dealt with in a rather ad hoc manner. The new committee will work almost exclusively electronically, and aim to respond quickly but authoritatively to consultations on such matters, which often have to be submitted within a very short timescale. As an example, Council received the response, made by the Council for the Mathematical Sciences, to the Research Councils UK consultation on the effectiveness and efficiency of peer review, which highlighted in particular the needs of mathematics.

Council congratulated Sylvia Daly on her 10 years working for the Society. During this period she has worked on grants to mathematicians totalling about £1.5M, an

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important contribution to mathematics in this country.

Council was pleased to learn of a new journal in the Society's portfolio: the *Journal of Topology*, with a very strong editorial board. The first issue will be in January 2008 and submissions of suitably high quality articles will be welcomed from now on. Finally, Council is keen to encourage greater participation by members in Society elections (turnout in last November's Council elections, for example, was 11%). To this end, the possibility and practicality of introducing electronic voting (as now used by the AMS and SIAM) will be explored.

Elizabeth Winstanley

## LAUNCH MEETING FOR THE JOURNAL OF TOPOLOGY

A few weeks ago, the launch of the new *Journal of Topology* was announced. To mark the start of our new venture, the editors will hold a short scientific meeting in the Mathematical Institute in Oxford from 19-21 March. The list of speakers will include:

- Martin Bridson (Imperial)Ralph Cohen (Stanford)
- Jean Lannes (Ecole Polytechnique, Paris)
  Wolfgang Lueck (Münster)
- Kenji Fukaya (Kyoto)

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John Roe (Penn State)

The editors would like to invite all who are interested to join us! Talks will start on Monday afternoon and the meeting will end at lunch time on Wednesday. More details on the meeting will be posted at www.maths.ox.ac.uk/~jtop. More details regarding the *Journal of Topology* can be found at www.lms.ac.uk/publications/jtop.html.

The meeting is supported by an LMS conference grant and funds are available for research students who would like to attend. For any further information contact Ulrike Tillmann (jtop@maths.ox.ac.uk).

## **LMS Newsletter**

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Charity registration number: 252660.

## LONDON MATHEMATICAL SOCIETY

## MIDLANDS REGIONAL MEETING

Room W001, Sir David Davies Building, Loughborough University

### Friday 20 April 2007

10:30 – 10:45	Arrival; poster display
10:45 – 12:00	LMS business meeting
	Frances Kirwan (Oxford)
	Non-reductive group actions and symplectic implosion
12:00 – 13:30	Lunch
13:30 – 14:30	Yves Colin de Verdière (Grenoble)
	On localisation of Laplace eigenfunctions:
	recent progress and open problems
14:30 – 15:00	Tea and coffee
15:00 – 16:00	Oleg Viro (Uppsala)
	The 16th Hilbert problem: a story of mystery,
	mistakes and solution
16:00 – 17:00	Mark Gross (UC, San Diego)
	Affine geometry, tropical geometry, and mirror symmetry
17:00 – 18:30	Wine reception
18.30	Dinner

Students are invited to make poster demonstrations of their work for display at the meeting. A book prize from Springer will be awarded for the best poster. Interested students should contact the organisers. For further details or to reserve a place at the dinner, contact the organisers or visit the website www-staff.lboro.ac.uk/~margh/conferences/LMS-07.

There are funds available to contribute to the expenses of members of the LMS or research students to attend the meeting and workshop. Requests for support should be made to the organisers: Rod Halburd (R.G.Halburd@lboro.ac.uk), Alexander Veselov (A.P.Veselov@lboro.ac.uk) and Alexey Bolsinov (A.Bolsinov@lboro.ac.uk).

The meeting will be followed by a workshop from 21-23 April on *Tropical Geometry*. The confirmed speakers include E. Feichtner, V. Fock, I. Itenberg, G. Mikhalkin, M. Passare, B. Siebert and A. Szenes. For further information visit www-staff.lboro.ac.uk/~margh/conferences/LMS-07/tropical/.

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## **RALPH HENSTOCK**

## **ANTHONY HORSLEY**

Professor Emeritus Ralph Henstock died peacefully in the Causeway Hospital, Coleraine, on 6 January 2007 after suffering a stroke last autumn. He was elected to the London Mathematical Society on 17 May 1945. Born in Newstead, near Nottingham, on 2 June 1923 to William and Mary Ellen Henstock, he shone in mathematics at school gaining a State Scholarship and the Henry Mellish Scholarship to study mathematics at St. John's College, Cambridge where, in 1943, he was classified as Wrangler in Part II and made scholar. War intervened and he was sent to the Ministry of Supply as a statistician. Eventually he was awarded Cambridge BA in 1944 and his London PhD in 1948. He was appointed Professor of Pure Mathematics at Coleraine (then the New University of Ulster) in 1970 and retired in 1988 having had a distinguished academic career in the universities of Queen's Belfast (Lecturer 1951-56), Bristol (Lecturer 1956-60), Queen's Belfast (Senior Lecturer 1960-62, Reader 1962-64) and Lancaster (Reader 1964-70).

In the fifties he and Jaroslav Kurzweil independently discovered what was then called the Riemann complete integral which, on the real line, includes the Lebesque integral but, unlike Lebesque, admits non-absolute convergence to the integral value. It is now generally referred to as the Henstock integral and has, for example, provided a unified approach to many problems in harmonic analysis which had previously been tackled using various absolute integrals. The simplicity of definition of the Henstock integral renders it suitable for teaching to undergraduates and this is done now in many countries throughout the world. He is survived by his son John.

> P.J. Muldowney, G. Shannon University of Ulster

Dr Tony Horsley who was elected a member of the London Mathematical Society on 12 October 1979 died on 26 May 2006 aged 67. He was a greatly valued colleague and an old friend to those of us who joined the Economics Department, as he did, at the end of the 1970s. Tony was unusually distinguished in holding PhDs both in Physics and in Economics. His area of interest lay in the more technical parts of mathematical economics, but he followed through these interests to practical issues in electricity pricing, an area in which he was very active over a long number of years. His contributions to undergraduate and graduate teaching in the area of mathematical economics were greatly appreciated. In more recent years, he took over our graduate recruitment process, an area which he and Kathy Watts managed with considerable skill and judgement, creating a formidable administrative machine to deal with our very large number of graduate applications. John Sutton, Convenor

Economics Department, LSE

## PAUL HALMOS

The LMS is sad to report the death of Professor Paul R. Halmos, a major figure in American mathematics, who died aged 89 on 2 October 2006 in San Jose, California, after a short illness. The following is part of an MAA notice: Renowned as a mathematical researcher principally in the areas of operator theory, ergodic theory and algebraic logic, but also in probability and statistics, topological groups, and Boolean algebras, he was also one of the pre-eminent mathematical expositors of his day, having written a series of classic texts: Finite-dimensional vector spaces, Measure theory, A Hilbert space problem book, Naive set theory, Problems for mathematicians young and old, to name only a few. These works of his and others inspired generations of students to pursue careers in mathematics. © The Mathematical Association of America. All rights reserved.

The London Mathematical Societv

# **R**Z

THE INSTITUTE OF MATHEMATICS AND ITS APPLICATIONS

## The 2007 David Crighton Lecture **Professor Sir Christopher Zeeman, FRS**

Tuesday 24 April 2007 at 5 pm followed by a reception

Royal Statistical Society, 12 Errol Street, London EC1Y 8LX

## What's wrong with Euclid Book V



Book V has long been considered to be the greatest achievement of Euclidean geometry. But Euclid forgot to define the ratio of two ratios leading to serious strategic consequences for Greek mathematics. In his lecture, Sir Christopher will introduce a new axiom to re-establish the propositions of Book V.

Before the lecture, Professor Sir Christopher Zeeman will be presented with the David Crighton Award. This is a medal awarded triennially in recognition of service to both mathematics and the mathematical community. It is co-sponsored by the London Mathematical Society and the Institute of Mathematics and its Applications.

Admission to the lecture is by ticket only. For tickets, please contact Susan Oakes at the LMS (oakes@lms.ac.uk or De Morgan House, 57-58 Russell Square, London WC1B 4HS) by Monday 16 April. Tickets are free of charge and will be allocated on a first come first served basis.

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## MATHEMATICS POLICY ROUNDUP

The January LMS Council approved the creation of a new Research Policy Committee, to be chaired by the Vice-President for research, David Larman. It will be responsible to Council for: developing the society's policies relating to research; monitoring developments affecting the health of mathematics research; leading on activities and submissions to inform and influence public policy in respect of mathematics research; and working with CMS and other bodies on related matters. The committee will have five other members, communicating mainly by email to provide a rapid response when a policy submission is needed. In February the Advisory Committee on

Mathematics Education (ACME) issued a widely reported statement on the government's plans to introduce two new mathematics GCSEs. The committee warned that the new system could mislead pupils into thinking that a single GCSE will be sufficient preparation for A-level mathematics. Whilst welcoming the move as providing pupils with both a deeper understanding of maths and a greater competence in applying their skills, ACME also warned that league tables may encourage schools to concentrate on only the compulsory GCSE. It called on the government to ensure that at least 60% of pupils take both GCSEs when they are rolled out nationally in 2010. The Council for the Mathematical Sciences backed ACME's statement and added that all schools must offer both GCSEs else they risk stifling pupils' future success.

The Engineering and Physical Sciences Research Council organised the *Engaging Maths* event at the Houses of Parliament on 28 February. All MPs and members of the House of Lords, as well as policy makers and influencers, were invited to meet mathematicians and learn more about their work. The event celebrated the mathematics behind research in seven areas: security; telecommunications and the internet; environment; finance and economics; industry; transport and travel; and medicine and biology. Many of the exhibitors were members of the LMS.

The HEFCE-funded more maths grads project has set a national launch date of 23 April 2007. The £3.3 million project is designed to increase and widen participation in undergraduate degrees in the mathematical sciences and will run over three years. The launch will take place at Queen Mary, University of London. For more information, please contact national project manager Helen Orr (based at the MSOR Network office at the University of Birmingham) by email at h.m.orr@ bham.ac.uk or see the project website at www.moremathsgrads.org.uk.

The LMS's newest publication is already attracting a steady stream of submissions. The Journal of Topology, which launched its first call for papers in January, draws its editorial board from a world class pool of topologists, with Professor Ulrike Tillmann serving as managing editor. Professor Tillmann, together with several other members of the editorial board, is based at the University of Oxford, which has a distinguished history in the field of topology. It was here, in the 1950s, that former LMS president JHC Whitehead and his team laid the foundations for contemporary topology, setting up the journal Topology. The new journal aims to be recognised as the most prestigious place for topologists to publish their work and will be published guarterly, on a not-forprofit basis and in conjunction with Oxford University Press.

> Caroline Davis Mathematics Policy and Promotion Officer

D Springer the language of science

## New Textbooks from Springer



Computational Turbulent Incompressible Flow Applied Mathematics:

Body and Soul 4 J. Hoffman, C. Johnson, Royal Institute of Technology

- KTH, Stockholm, Sweden This is Volume 4 of the book

series of the Body and Soul mathematics education reform program. It presents a unified new approach to computational simulation of turbulent flow starting from the general basis of calculus and linear algebra of Vol 1-3.

2007. XIX, 397 p. Hardcover ISBN 978-3-540-46531-7 ► € 59,95 | £38.50

### **Partial Differential Equations**

J. Jost, Max-Planck-Institut für Mathematik in den Naturwissenschaften, Leipzig, Germany

From the reviews ► Beautifully written and superbly well-organised, I strongly recommend this book to anyone seeking a stylish, balanced, up-to-date survey of this central area of mathematics. ► Nick Lord, The Mathematical Gazette

2nd ed. 2007. XIV, 356 p. 10 illus. (Graduate Texts in Mathematics, Volume 214) Hardcover ISBN 978-0-387-49318-3 ► € 46,95 | £36.00

### philiger

springer.com

### **Techniques of Constructive Analysis**

**D. S. Bridges**, **L. S. Vita**, University of Canterbury, Christchurch, New Zealand

This book is an introduction to constructive mathematics with an emphasis on techniques and results obtained in the last twenty years.

2006. XVI, 213 p. (Universitext) Softcover ISBN 978-0-387-33646-6 ► € **39,95 | £30.50** 

### **Compact Lie Groups**

M. R. Sepanski, Baylor University, Waco, TX, USA

Blending algebra, analysis, and topology, the study of compact Lie groups is one of the most beautiful areas of mathematics and a key stepping stone to the theory of general Lie groups.

2007. XII, 198 p. (Graduate Texts in Mathematics, Volume 235) Hardcover ISBN 978-0-387-30263-8 ► € 39,95 | £30.50

### An Introduction to Operators on the Hardy-Hilbert Space

R. A. Martinez-Avendano, University Autonoma del Estado de Hidalg, Mexico; P. Rosenthal, University of Toronto, ON, Canada

Evolved from a graduate course at the University of Toronto, the book is suitable as a text for beginning graduate students, and well-prepared advanced undergraduates, as well as for independent study.

2007. XII, 220 p. (Graduate Texts in Mathematics, Volume 237) Hardcover ISBN 978-0-387-35418-7 ► € **39,95 | £30.50** 

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## **NEWS FROM IMU**

At the beginning of 2007 a new IMU executive committee has started its four-year term with the following members:

President: László Lovász (Hungary) Secretary: Martin Grötschel (Germany) Vice Presidents: Zhi-Ming Ma (China), Claudio Procesi (Italy)

Members at Large: M. Salah Baouendi (USA), Manuel de León (Spain), Ragni Piene (Norway), Cheryl E. Praeger (Australia), Victor A. Vassiliev (Russia), Marcelo Viana (Brazil) Ex Officio: John M. Ball, Past President (United Kingdom)

With the change of the secretary, the IMU

office has moved from Princeton to Berlin. The new IMU office address is: International Mathematical Union, Office of the Secretariat, Zuse Institute Berlin, Takustr. 7, D-14195 Berlin, Germany (fax: + 49 30 84185 – 269, email: secretary@mathunion.org).

### The ICM through history

At the ICM in Madrid last year there was an exhibition, curated by Guillermo Curbera, on the history of the ICMs. Parts of this exhibit are now available at the web site http:// euler.us.es/~curbera/icm/curbera-icm.html.

### News from ICMI

What we know today as ICMI (International Commission on Mathematical Instruction) was initially a Commission founded in 1908 at the International Congress of Mathematicians in Rome with Felix Klein as President. Its first aim was to compare the methods and plans of teaching mathematics in different countries. This initiative met with a great success. From that time its mission has progressively enlarged and today its ambition is to provide an international forum for the study and improvement of mathematics education around the world, a space for reflection,

exchange and collaboration, for the dissemination of ideas and results, to all those professionally concerned by mathematics education: teachers, teacher educators, curriculum developers, scholars, mathematicians, administrators, policy-makers. Beyond the International Congresses in Mathematics Education (ICME) organized every four years, ICMI tries to achieve this ambition through different activities: ICMI Studies, Regional Conferences, Solidarity Fund activities, through the support it offers to different projects in collaboration with IMU, UNESCO and other institutions, and last but not least through the activities of its five Affiliated Study Groups:

- The International Study Group on the Relations between the History and Pedagogy of Mathematics (HPM);
- The International Group for the Psychology of Mathematics Education (PME);
- The International Organization of Women and Mathematics Education (IOWME);
- The World Federation of National Mathematics Competitions (WFME);
- The International Study Group for Mathematical Modelling and Applications (ICTMA).

For more information on ICMI activities see www.mathunion.org/Organization/ ICMI.

Although ICMI is a sub-commission of IMU, the collaboration between the two institutions has not always been very intense. Since 1998, the situation has greatly improved, due to the action of the two Executive Committees and of their respective Presidents: Hyman Bass for ICMI, Jacob Palis and then John Ball for IMU. The first joint ICMI-IMU Study, called The Pipeline Study, whose aim is to study the number of students choosing to do mathematics at university level in various countries and how this has changed over the last 10 or 20 years, is now starting. Within the framework of the DCSG (Developing Country Strategy Group) of IMU, we have begun to coordinate our respective actions towards the developing world in Africa, and now in South East Asia, in collaboration also with the CIMPA (International Centre for Pure and Applied Mathematics).

We have jointly supported the international exhibition *Experiencing Mathematics* realized under the auspices of UNESCO and its one-year travel in Southern Africa in 2006. We are jointly planning for the future regional seminars in developing countries involving activities directed to mathematicians, mathematics teachers and mathematics educators. I thus enter the Presidency of ICMI at a time when new avenues open, hoping that, thanks to this increasing collaboration, ICMI and IMU will be able to find new and better solutions to the many and difficult problems that mathematics education and the preparation of teachers face all over the world.

Being elected as the President of ICMI is an immense honour and also a huge responsibility, but seeing what has been accomplished up to now makes me confident for the future, and I hope that during my mandate the members of the mathematics community will contribute more and more to ICMI activities all over the world.

> Michèle Artigue President of ICMI

### Pan African Congress of Mathematicians

The African Mathematical Union (AMU) in cooperation with the Egypt Academy of Scientific Research & Technology (ASRT) announces the seventh Pan African Congress of Mathematicians. The theme of the congress is to be Mathematical Sciences Developments and Trends and will take place from 27-31 August 2008 at the Teba Rose Hotel, Heleopolis, Cairo, Egypt.

**2007 Wolf Prizes in Mathematics and Physics** The 2006/7 Wolf Prize in Mathematics will be jointly awarded to Stephen J. Smale (University of California at Berkeley, Berkeley, California, USA) for his groundbreaking contributions that have played a fundamental role in shaping differential topology, dynamical systems, mathematical economics, and other subjects in mathematics and Harry Furstenberg (The Hebrew University of Jerusalem, Jerusalem, Israel) for his profound contributions to ergodic theory, probability, topological dynamics, analysis on symmetric spaces and homogenous flows.

The 2007 Wolf Prize in Physics is shared by Professor Albert Fert (France) and Professor Peter Gruenberg (Germany), for their independent discovery of the giant magnetoresistance phenomenon, thereby launching a new field of research and applications known as spintronics, which utilizes the electron spin to store and transport information.

The Prize in each field will be presented by the President of the State of Israel at the Knesset in Jerusalem on 13 May 2007. For further information visit the website: www.wolffund.org.il.

The above items are taken from the 21st issue of the IMU electronic newsletter *IMU Net* (see www.mathunion.org/Publications/Newsletter).

## NEWS FROM THE ISAAC NEWTON INSTITUTE

Sir David Wallace, previously Vice-Chancellor of Loughborough University and currently Treasurer and Vice-President of the Royal Society, became the new Director of the Newton Institute on 1 October 2006. He would be very happy to receive comments or suggestions regarding the Newton Institute and its activities, including possibilities for future programmes. He can be contacted by email at david.wallace@newton.cam.ac.uk.

Sir David is visiting in person as many Universities and other institutions as possible in order to spread the word about what the Institute has to offer; to understand how the Institute might best change and adapt to the

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needs of the UK community; and to get a feel for the most exciting up-coming areas of research.

The Chairman of the National Advisory Board (see www.newton.cam.ac.uk/nab.html). Elmer Rees (e.rees@bristol.ac.uk), would be happy to receive comments about the work of the Institute for discussion at future meetings. In particular, any firm evidence of the difficulties that might be faced by UK academics in attending Newton Institute programmes would be very welcome.

### Programme announcements

The following new programmes have now been confirmed for 2008 and 2009:

- Design of Experiments (21 July - 15 August 2008)
- Algebraic Lie Theory (12 January – 26 June 2009)

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- Discrete Integrable Systems
- (19 January 3 July 2009)

A full list of all future programmes may be found at www.newton.cam.ac.uk/programmes.

### Workshop announcements

The following workshops have now been finalised:

- Bayesian Nonparametric Regression: Theory, Methods and Applications (30 July -24 August 2007)
- EMBO Workshop on Current Challenges Problems in Phylogenetics and (3-7 September 2007)

A full list of workshops and events at the Newton Institute can be found at www.newton.cam.ac.uk/events.html.

### Scientific programme reports available

Final scientific reports on the following past programmes at the Newton Institute are now available:

- Logic and Algorithms (January to July 2006) • Principles of the Dynamics of Non
- Equilibrium Systems (January to June 2006)
- Global Problems in Mathematical Relativity (August to December 2005)

• Pattern Formation in Large Domains (August to December 2005)

Links to all of these reports in .pdf format can be found at www.newton.cam.ac.uk/reports/.

### Annual Report

The Institute's Annual Report for 2005-6 has now been published. The report is available at www.newton.cam.ac.uk/reports/.

### Invited participants

The Newton Institute strongly encourages its long-term participants from overseas to visit other UK institutions during their stay. The Institute will pay the travel costs (but not accommodation, etc.) for such visits on request. Organisers of local seminar series should look at the web page listing those participants who are interested in receiving invitations to travel (www.newton.cam.ac.uk/ programmes/Speakers.html).

Every invited participant in future Institute programmes is listed on the website. Go to www.newton.cam.ac.uk/programmes/ and click on the relevant programme; then click the 'Invited Participants' link on the left. You'll be given a full list of invitees and their dates. This may enable you or your colleagues to invite them to visit your institution.

### Junior membership

The Institute aims to maximise the opportunities it offers to junior researchers, and therefore operates a Junior Membership scheme. To be eligible for Junior Membership of the Institute you must be a Research Student or within five years of having received a PhD (with appropriate allowance for career breaks), and you must work or study in a UK University, in a UK academic institution or in a R&D group in industry or commerce. Junior Members may apply for special grants to allow them to attend workshops, conferences and summer schools. Further details are available at www.newton.cam.ac.uk/junior.html.

## LONDON MATHEMATICAL SOCIETY

## **Spitalfields Day**

## **Geometric Analysis** as part of a workshop on geometric flows and related topics

Mathematics Institute, University of Warwick Monday 26 March 2007

### 10.00 – 10.30 Coffee and workshop registration

- 10.30 11.30 Gerhard Huisken (Max-Planck AEL Golm) Mean curvature type flows and isoperimetric inequalities
- 11.40 12.40 Richard Schoen (Stanford) Recent progress on the high dimensional Yamabe problem
- 12.40 2.00 Lunch
- 2.00 3.00Bruce Kleiner (Yale) An overview of Perelman's work on geometrization
- 3.00 3.45 Tea/coffee
- William P. Minicozzi II (Johns Hopkins) 3.45 - 4.45 Width and finite extinction of Ricci flow
- 4.45 Wine reception

This Spitalfields Day is being held on the first day of a workshop on Geometric Flows and Related Topics. The workshop is part of a year-long symposium on Low Dimensional Geometry and Topology organised by Caroline Series.

The talks will be aimed at a general audience of mathematicians and graduate students. Anyone interested is welcome; let the Mathematics Research Centre (mrc@maths.warwick.ac.uk) know if you intend to come.

There are limited funds available to assist research students to attend, please apply to the Mathematics Research Centre (mrc@maths.warwick.ac.uk).

Scientific enquiries may be addressed to the organiser Peter Topping (P.M.Topping@warwick.ac.uk).

For further information visit www.maths.warwick.ac.uk/research/2006 2007/ symposium/workshops/wks2.html.

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## **EULER YEAR 2007**

Leonhard Euler – possibly the most prolific mathematician of all time, and one who had an enormous influence over many areas of mathematics, both pure and applied – was born on 15 April 1707 in Basel, later spending many years in Berlin and St Petersburg. He remains, however, largely unknown to the general public. A number of events have been organised to mark his 300th anniversary, of which the following are a small selection.

In the USA the Mathematical Association of America is very excited about the Euler anniversary. Preceding the Joint Winter Meeting of the AMS-MAA in New Orleans last month there was an excellent two-day course on Euler's life and works, and the meeting itself (attended by over 5000 participants) featured many further Euler-related talks. This year the MAA publishes no fewer than five Euler-related books, two of which have already appeared. A couple of local MAA branches celebrate Euler's birthday in April. Later in the year there is an organised MAA Study Tour to Basel, Berlin and St Petersburg, and the MAA summer meeting will be held jointly with the Euler Society.

There are several events in St Petersburg in June and July – notably an Euler Festival from 10-12 June and a succession of satellite meetings: see www.pdmi.ras.ru/EIMI/2007/Euler300/ for details.

There are many events in Basel, the city of his birth, including the issue of a special stamp on 6 March, a public celebration on 20 April and an international symposium on 31 May – 1 June. There are also a programme for high schools and a public problem-solving competition, and there is an Euler exhibition at the Public Library of the University of Basel from 16 March to 9 June. An Euler biography and an Euler comic book are being published. Further details can be found on www.euler-2007.ch/en/agenda.htm. In Britain Euler events include a one-day meeting on *Euler's mathematical legacy* in Oxford on 30 June (organised by the Open University's Centre for the History of the Mathematical Sciences and the British Society for the History of Mathematics), an Euler lecture at Gresham College, London on 9 May, and an Euler session at the British Association meeting in York in September.

> Robin Wilson Open University

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## **EULER CONJECTURE**

On the occasion of the 300th Anniversary of Euler's birth, A.A. Mullin proposes the following challenge on a variation of a conjecture of Euler [*Opera Omnia*, Ser. 1, vol. 4, pp. 120-124]. *Proposition:* If n>0 then any integer of the form (8n+3) is the sum of an odd perfect power and an even square-free with precisely the same number of prime factors as that power, possibly in many essentially different ways. For example

59=1.1+2.29=5.5+2.17=7.7+2.5 and 291=1.1.1+2.5.29=3.3.3.3+2.3.5.7.

Kindly send any results to A.A. Mullin at 172 Manningham Drive, Madison, AL 35758, USA.

## CHRIST'S COLLEGE, CAMBRIDGE

The Fellows of Christ's College, Cambridge have chosen Professor Frank Kelly FRS as the 37th Master, to succeed Professor Malcolm Bowie. Frank Kelly is Professor of the Mathematics of Systems in the University of Cambridge. He was elected a Research Fellow of Christ's College in 1976 and a Fellow of the Royal Society in 1989. From 2003 to 2006 he served as Chief Scientific Adviser to the UK Government Department for Transport. The first Master was John Syclyng from 1505-1506.



University of London

## **Department of Mathematics**

## **Reader/Lecturer in Financial Mathematics**

Applications are invited for a Readership or Lectureship in Financial Mathematics in the Department of Mathematics at King's College London, to be taken up in September 2007 or as soon as possible thereafter.

The Department of Mathematics has a long and distinguished history, and is advantageously located in the heart of London, between the West End and the financial district of the City of London. The Department has prominent research groups in Analysis, Complex and Disordered Systems, Financial Mathematics, Number Theory, and Theoretical Physics. The successful candidate will join the Financial Mathematics group, which is one of the most active of its kind in Europe.

Candidates applying for the permanent position of Reader in Financial Mathematics should have an outstanding record of research and publication, and show clear evidence of (a) an international scholarly reputation in some area of mathematical finance, and (b) excellent teaching skills at undergraduate or MSc level. Candidates applying for the permanent position of Lecturer in Financial Mathematics should have a PhD. (or be close to submission), an established track record of research excellence in some area of mathematical finance, and teaching experience at undergraduate or MSc level.

The appointment will be made on either the Reader scale, currently £42,567 to f47.941 per annum inclusive of London Allowance, or on the Lecturer B scale, currently £32,314 to £40,772 per annum inclusive of London Allowance.

Application forms and further particulars can be obtained from: Human Resources Services, King's College London, Strand, London WC2R 2LS, email: strand-recruitment@kcl.ac.uk or fax +44 (0)20 7848 1352 guoting reference A4/CCM/10/07; or at the following website: www.mth.kcl.ac.uk/vacancies/

The closing date for receipt of completed applications is 15 March 2007. Please guote reference A4/CCM/10/07 in any correspondence.

Prospective applicants are welcome to contact either Professor Lane P. Hughston (Lane.Hughston@kcl.ac.uk) or Professor William T. Shaw (William.Shaw@kcl.ac.uk) with any informal enquiries about these posts.

Equality of Opportunity is College policy.

## **KARL PEARSON SESOUICENTENARY**

Registration is now open for a one-day conference being held at the Royal Statistical Society on Friday 23 March to celebrate the 150th birthday of the Victorian mathematician Karl Pearson (1857-1936) who established the discipline of mathematical statistics. Speakers at the event will include Eileen Magnello, Chris Pritchard, June Barrow Green, John Aldrich, Stephen Stigler and A.W.F. Edwards.

The event is jointly organised by the Royal Statistical Society, the British Society for the History of Mathematics and the British Society for the History of Science. Contact Paul Gentry at the RSS (p.gentry@ rss.org.uk) for a booking form or visit www.rss.org.uk/diary.

## **25TH JOURNÉES ARITHMÉTIQUES**

The 25th Journées Arithmétiques meeting will be held at the University of Edinburgh from 2-6 July. The Invited Speakers are:

- Enrico Bombieri (Institute for Advanced Study, Princeton)
- Régis de la Bretèche (Université Paris VII)
- Pierre Colmez (École Polytechnique, Paris)
- Andrew Granville (Université de Montréal)
- Mark van Hoeii (Florida State University)
- Kiran Kedlaya (Massachusetts Institute of Technology)
- Chandrashekhar Khare (University of Utah)
- Mark Kisin (University of Chicago)
- János Pintz (Alfréd Rényi Institute, Budapest)
- Gaël Rémond (Université Grenoble I)
- Joël Rivat (Université de la Méditerranée, Marseille)
- Andrei Yafaev (University College, London) The Scientific Committee is: Paula Tretkoff (Texas A&M) (Chair), Massimo Bertolini (Milan), John Cremona (Nottingham), Bas

Edixhoven (Leiden), Joachim von zur Gathen (Bonn), Ben Green (Cambridge), Alan Lauder (Oxford), Jan Nekovar (Paris), Emmanuel Pevre (Grenoble), Gérald Tenenbaum (Nancy), Umberto Zannier (Pisa).

For further information see the Journées Arithmétiques website www.ja2007.org. The closing date for early registration is 13 April. The meeting is supported by the London Mathematical Society, as well as by Compositio Mathematica Foundation, Edinburgh Mathe-matical Society, Glasgow Mathematical Trust, International Centre for the Mathematical Sciences and the University of Edinburah.

## **GROUPS IN GALWAY**

The annual Groups in Galway conference will be held at the National University of Ireland, Galway, from 18-19 May this year. All who are interested are invited to attend. The following is a provisional list of speakers so far:

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- Peter Campbell (University of Bristol)
- Bettina Eick (TU Braunschweig)
- Murray Elder (Stevens Institute of Technology)
- Charles Leedham-Green (Queen Mary, University of London)
- Colva Roney-Dougal (University of St Andrews)
- Howard Smith (Bucknell University)

The scope of the conference covers all areas of group theory, applications, and related fields. This year the conference will once again include a poster session. All interested persons, especially postgraduate students, are invited to contribute to this session. Prospective participants should register their intention to attend the conference by contacting Dane Flannery (dane.flannery@ nuigalway.ie) or Rachel Quinlan (rachel. guinlan@nuigalway.ie). Further information will be posted on the conference website www.maths.nuigalway.ie/conferences/gig07 as it becomes available.

### No. 357 March 2007

## THE LONDON MATHEMATICAL SOCIETY

### NEWSLETTER

## INFERENCE METHODS FOR COMPLEX AND HIGH DIMENSIONAL STRUCTURED SYSTEMS

Today's information age revolves around the collection and analysis of data. The use of statistical methods to study highly structured and complicated systems has become a vital component of many areas of the natural and social sciences, for example biochemistry, bioinformatics, geophysics, econometrics, finance, image processing and computer vision. The Research Section of the Royal Statistical Society is planning to organize a multidisciplinary half-day ordinary meeting with a number of presentations on the subject of methodology for structured systems. Examples of such methodology include:

- Innovative statistical modelling for complex physical structures, where the cuttingedge models would respect the complexity of the data generating process.
- Application and development of new sampling theory. Given the wealth of modern data acquisition tools, problems are often found in the correct treatment of high frequency data.
- Development of multiscale tools and their application to physical problems. Many physical processes have many characteristic length and time scales, and different structures and physical processes are associated with the different spatio-temporal scales that need to be incorporated in the model. The Research Section Committee invites

papers on topics such as these by 31 July with a view to presentation of a small selection in June 2008 and subsequent publication with discussion in the *Journal of the Royal Statistical Society*, Series B. Authors will be notified whether their papers have been accepted by December 2007. Please indicate whether, if your manuscript is not accepted for reading, you would like it alternatively to be considered as an ordinary paper for Series B.

If you have any questions regarding the procedure contact the secretary of the Research Section Committee, Ernst Wit (e.wit@lancaster.ac.uk). Please submit your manuscript to the Executive Editor of the RSS (journal@rss.org.uk) before **31 July 2007**.

## DIOPHANTINE EQUATIONS VIA ANALYTIC NUMBER THEORY

Diophantine Equations via Analytic Number Theory (DEViANT) is a workshop taking place at the School of Mathematics, University of Bristol from Monday 9 to Thursday 12 July. The primary goal of this workshop is to stimulate further progress in the study of Diophantine geometry, with an emphasis on methods involving analytic number theory. Confirmed plenary speakers so far:

- R. de la Bretèche (Paris VII)
- J. Brüdern (Stuttgart)
- A. Chambert-Loir (Rennes)
- J.-L. Colliot-Thélène (Paris XI)
- U. Derenthal (Göttingen)
- R. Dietmann (Stuttgart)
- R. Heath-Brown (Oxford)
- H.A. Helfgott (Bristol)
- C. Hooley (Cardiff)
- E. Peyre (Grenoble)
- P. Salberger (Göteborg)
- A. Skorobogatov (Imperial)
- P. Swinnerton-Dyer (Cambridge)
- Y. Tschinkel (Göttingen/New York)
- T. Wooley (Michigan)

There is limited funding available for PhD students based in the UK. This workshop is sponsored by the Heilbronn Institute and the London Mathematical Society. DEViANT is organised by Tim Browning and Martin Bright. Email deviant@boojum.org.uk if you need any further information or visit the website www.boojum.org.uk/deviant/index.html.

### HISTORY OF MATHEMATICS SERIES

# $N\!e\!w$ from the ams

## The Volterra Chronicles The Life and Times of an Extraordinary Mathematician 1860–1940

Judith R. Goodstein, California Institute of Technology, Pasadena, CA

The tumultuous life and extraordinary contributions of Italian mathematician and scientist Vito Volterra are chronicled in this richly

illustrated book, the first full-scale biography available. The text chronicles Volterra's meteoric rise as a leader in Italy's modern scientific renaissance and his tragic fall under the rule of Benito Mussolini. Based partly on unpublished family letters, the book explores the family dynamics and historical influences that shaped this pioneering mathematician.

History of Mathematics, Volume 31; 2007; approximately 315 pages; Hardcover; ISBN: 978-0-8218-3969-0; List US\$59; All AMS members US\$47; Order code HMATH/31

Co-published with the London Mathematical Society beginning with Volume 4. Members of the LMS may order directly from the AMS at the AMS member price. The LMS is registered with the Charity Commissioners.



A Mathematical Guide to the Black-Scholes Formula

Seán Dineen, University College

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### A History of Analysis

Hans Niels Jahnke, University of Essen, Germany, Editor

History of Mathematics, Volume 24; 2003; 422 pages; Hardcover; ISBN: 978-0-8218-2623-2; List US\$89; All AMS members US\$71; Order code HMATH/24

Co-published with the London Mathematical Society beginning with Volume 4. Members of the LMS may order directly from the AMS at the AMS member price. The LMS is registered with the Charity Commissioners.

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## **CHEREDNIK ALGEBRAS**

The International Centre for Mathematical Sciences (ICMS) in Edinburgh is running a workshop on Cherednik Algebras from 18-22 June. The first Cherednik algebras were double affine Hecke algebras: these were used to solve the Macdonald inner product conjectures. Since then, these algebras and their offshoots have become increasingly influential in a growing number of fields. Their representation theory has significant connections with algebraic geometry, combinatorics, finite dimensional algebra, homological algebra, integrable systems, Lie theory, noncommutative algebra and *q*-calculus. They have been used to confirm conjectures and answer questions in all of these subjects. Confirmed speakers include:

- Y. Bazlov (Warwick)
- A. Berenstein (Eugene, Oregon)
- Y. Berest (Cornell)
- K. Brown (Glasgow)
- O. Chalykh (Leeds)
- P. Etingof (MIT)
- V. Ginzburg (Chicago)
- N. Guay (Versailles)
- A. Oblomkov (IAS, Princeton)
- E. Opdam (Amsterdam)
- A. Premet (Manchester)
- E. Rains (UC Davis)
- J.T. Stafford (Ann Arbor)
- T. Suzuki (RIMS, Kyoto)
- M. Varagnolo (Cergy-Pontoise)
- E. Vasserot (Paris 7)

See http://icms.org.uk/workshop.php?id=8 for more information. Those interested should contact lain Gordon (i.gordon@ ed.ac.uk). There may be funding available for participants; in particular we have some special funds set aside for PhD students.

The workshop is supported by the ICMS, the London Mathematical Society and the Glasgow Mathematical Journal Trust Fund.

## NUMERICAL ANALYSIS AND APPLIED MATHEMATICS

The aim of the International Conference of Numerical Analysis and Applied Mathematics 2007 (ICNAAM 2007) is to bring together leading scientists of the international numerical and applied mathematics community and to attract original research papers of very high quality. The topics to be covered include (but are not limited to) all the research areas of numerical analysis and computational mathematics and all the research areas of applied and industrial mathematics. The conference will be held from 16-20 September in Corfu, Greece. Invited Speakers so far:

- Carl R. de Boor (University of Wisconsin Madison, USA)
- C.W. Gear (University of Illinois at Urbana-Champaign, USA)
- Mariano Gasca (Universidad de Zaragoza, Spain)
- G. Alistair Watson (University of Dundee, UK) The Proceedings of ICNAAM 2007 will be published in the American Institute of Physics Conference Proceedings. You are invited to

submit a paper and/or a proposal to organize a workshop or minisymposium. For further information contact the ICNAAM, Secretary (tsimos@mail.ariadne-t.gr) with a copy to: tsimos.conf@gmail.com or by post to: 10 Konitsis Street, Amfithea Paleon Faliron, GR-175 64, Athens, Greece (fax: +30210 94 20 091 or + 302710 237 397).

## BMC 1952

Tony Mann is interested in the British Mathematical Colloquium held at the Royal Naval College, Greenwich, in 1952, and would like to hear of any memories of the event. He can be contacted at A.Mann@gre.ac.uk, on 020 8331 8709 or by post at Department of Mathematical Sciences, University of Greenwich, Old Royal Naval College, Park Row, London SE10 9LS. Any assistance would be very welcome.

## COMBINATORICS AT OXFORD

A one-day meeting in Combinatorics will be held in Oxford on Wednesday 14 March. The meeting will take place in the Mathematical Institute, with talks starting at 11 am and coffee available beforehand from 10.30 am. This year's speakers will include:

- Graham Brightwell (LSE)
- Philippe Flajolet (INRIA)
- Nati Linial (Jerusalem)
- Jarik Nesetril (Prague)
- Bruce Reed (McGill)

Anyone interested is welcome to attend. Some funds may be available to contribute to the expenses of research students who wish to attend the meeting. Further details can be obtained from Alex Scott (scott@maths.ox.ac.uk) or from the web (www.maths.ox.ac.uk/combinatorics/). Support for this event by the London Mathematical Society and the British Combinatorial Committee is gratefully acknowledged.

## NUMBER THEORY AND RANDOM PHENOMENA

A workshop entitled Number Theory and Random Phenomena is to be held at the University of Bristol from Monday 26 to Friday 30 March. Probability has played an increasingly important role in number theory. There are now many results and conjectures in number theory that have a probabilistic flavour – for example central limit theorems, large deviation results, and links with random matrix averages. But there is much more to probability and statistics than this. Our goal in the workshop is to explore whether other, deeper, connections may exist.

The organisers are Chris Hughes, Jon Keating and Nina Snaith. For more information and to register for the workshop email Rebecca Ireland (r.e.a.ireland@bristol.ac.uk) or visit the website: www.maths.bris.ac.uk/ research/labs/heilbronn/heilbronnconf12006.pdf.



### NEWSLETTER

## **VISIT OF PROFESSOR V. BUSLAEV**

Professor Vladimir Buslaev (St. Petersburg University) will be visiting the UK from 20 March – 6 April. Professor Buslaev is one of the leading experts in the areas of the asymptotic theory of linear and non-linear wave propagation. He will give talks at the London Analysis Seminar (22 March), University of Birmingham (29 March) and University of Bath.

For further information contact Alexander Pushnitski at King's College London (alexander.pushnitski@kcl.ac.uk). His visit is supported by an LMS Scheme 2 grant.

## **VISIT OF DR O. BAUES**

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Dr Oliver Baues (University of Karslruhe, Germany) will be visiting the UK during March. His research interests are in Geometry and Algebra, in particular Lie groups and applications in differential geometry and topology. Lectures will take place on:

- Friday 9 March, Department of Mathematical Sciences, Durham University
- Tuesday 13 March, Department of Mathematics, Royal Holloway, University of London
- Friday 16 March, School of Mathematics, University of Southampton

For further information please contact Dr N. Peyerimhoff (norbert.peyerimhoff@ durham.ac.uk). This visit is supported by an LMS Scheme 2 grant.

## **VISIT OF DR YU. BEREST**

Dr Yu. Berest (Cornell University, USA) will visit the UK from 10 March – 10 April. His visit is partially supported by an LMS Scheme 2 grant. Dr Berest is well known for his work in mathematical physics, representation theory and noncommutative geometry. During his visit he will be based at the University of

Leeds and will also lecture, apart from Leeds. at University of Glasgow and Loughborough University. The provisional dates are: 12 March, Leeds

- 20 March, Loughborough
- 28 March, Glasgow

For further information please contact Oleg Chalykh (o.chalykh@leeds.ac.uk).

## PROBABILITY AND STATISTICS

The 30th UK Research Students' Conference in Probability and Statistics, and Lecture Day on Recent Developments in Applied Bavesian and Robust Statistics will take place from 27-30 March at Durham University

The Research Students' Conference is an annual event which aims to give postgraduate statisticians an appropriate forum to present their research. This year, it is organised by Durham postgraduate students, and it provides an excellent opportunity for students to make contact and discuss their work with others with similar interests. In addition to the students' presentations, there will be a few social events, and three key-note lectures by leading statisticians: Professor Julian Besag FRS (Seattle, USA) and Professor Michael Goldstein (Durham) will speak at the opening session, Professor Stephan Morgenthaler (Lausanne, Switzerland) will speak at the closing session. More information is available at the webpage: www.dur.ac.uk/rsc2007/.

The Department of Mathematical Sciences at Durham University organises an additional Lecture Day, immediately following the Students' Conference. At this day, Professors Besag and Morgenthaler will also give lectures, with further contributions by Professor Peter Green (Bristol), Professor Christopher Jennison (Bath), Dr Allan Seheult (Durham) and Dr Peter Craig (Durham). All are welcome to attend this day. Further information is available at the webpage: www.dur.ac.uk/ rsc2007/lectday.htm.



## Modern Birkhäuser Classics (MBC)

Many of the original research and survey monographs in pure and applied mathematics published by Birkhäuser in recent decades have been groundbreaking and have come to be regarded as foundational to the subject. Through the MBC Series, a select number of these modern classics. entirely uncorrected, are being re-released in paperback to ensure that these treasures remain accessible to new generations of students, scholars, and researchers.

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BIRKHÄUSER

## WOMEN IN MATHEMATICS DAY 2007

The next Women in Mathematics Day will be held on **27 April** at De Morgan House. Sessions will include talks by practising 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. It is hoped that an opportunity to see women who are active and successful in mathematics, and to meet them informally will be beneficial. Feedback from previous meetings has shown that participants find this useful. While this is an occasion particularly for women active in mathematics to get together, men are certainly not excluded.

Any postgraduates, postdocs or research assistants interested in giving a talk or presenting a poster during the afternoon session should contact Dorothy Buck (d.buck@imperial.ac.uk) by 15 April.

### Draft Programme

10.30-11.00 Registration and coffee

11.00-12.45 Morning Session

Professor Caroline Series (Warwick) Continued Fractions and Hyperbolic Geometry

Professor Nancy Nichols (Reading) The Weather Modelling Problem

Dr Sarah Waters (Nottingham) Mathematics in Medicine and Biology

- 12.45-13.45 Lunch
- 13.45-15.30 Afternoon Session Postgraduate/Postdoc speakers
- 15.30-16.30 Tea and Poster Session

Followed by an early evening meal for those able to stay.

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

To register please contact Isabelle Robinson, Administrative Officer (robinson@lms.ac.uk). The day is free for students and £5 for all others – payable on the day.

## IMC FOR UNIVERSITY STUDENTS

The 14th International Mathematics Competition (IMC) for University Students is being co-organized by University College London and hosted by the American University in Bulgaria, Blagoevgrad, from 3-9 August. 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) and Combinatorics. The working language will be English. Over the previous thirteen competitions we have had participants from one hundred and forty seven universities in thirty six countries.

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 4 August 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) and Combinatorics. The problems given at the last thirteen Competitions can give a general idea of the level expected (see the IMC web site www.imc-math.org.uk). Additional topics may be also included.

The students' work will be evaluated by Team Leaders and other Professors and Assistant Professors using criteria provided by the Jury. Participants are invited to confirm their intention to participate, either by online registration or by email, by the end of May, 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 3 August to breakfast on 9 August, has not yet been finalized.

Please 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 John Jayne (j.jayne@ucl.ac.uk).

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## APPLICATIONS OF MULTISCALE METHODS AND STATISTICAL INFERENCE

The Royal Statistical Society, with support from EPSRC, organises a programme of training aimed at postgraduates, primarily those in the first or second years of their PhDs, via one week long courses. This year a one week long course comprising two modules will be held at University College London in 2-6 July. The two modules are *Fundamentals of statistical inference* and *Multiscale methods and statistical modelling of nonstationary phenomena*. The first module is given by Alastair Young, and the second by Emma McCoy and Sofia Olhede.

Each course will be taught in a combination of lectures and tutorial sessions. For more information see the RSS webpages for the graduate training programme at: www.rss.org.uk/main.asp?page=1349.

## 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 14 March. Areas of possible supervision include various aspects of Nonlinear Waves. Diffraction Theory, Integrable Systems, Inverse Problems, 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, Mathematical Processes in Finance and Mathematical Processes in the Environment. For further information contact Dr E.V. Ferapontov (tel: 01509 223309, email: E.V.Ferapontov@

that my decision was not so ignorant as the last guarter of a century has made it seem.

Wolfgang Pauli's famous dismissal of a paper on the grounds that it was 'not even wrong' seems to appeal to the Popperian principle that any decent piece of theoretical physics must possibly be wrong. The phrase makes an apt title for Woit's book, succinctly summarising his case against string theory; it doesn't tell us anything, not even anything wrong. Original hopes that the superstring idea would lead to a unique description of physical reality have been dissipated as the theory has crumbled into a myriad of possible models. The principles of superstring theory turned out to be not so much like the Euclid-Hilbert axioms of geometry, leading to a single universe, as like the axioms for a group. An attempt to resolve this indefiniteness which particularly attracts Woit's criticism is the anthropic principle: the one model of string theory which describes the actual universe is the one which makes human life possible.

The first half of the book sets up the background for string theory by describing the successes of fundamental physics in the last century, both experimental and theoretical. Particle accelerators are described with, it

## **REVIEWS**

openday.html.

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Not Even Wrong by Peter Woit, Jonathan Cape, 2005. xiii + 290pp. £18.99, ISBN 0224076051

lboro.ac.uk) or visit the website

www.lboro.ac.uk/departments/ma/pginfo/

Ah, this is the book for me. In the early eighties I was writing a book intended for a mathematically educated reader with no knowledge of guantum mechanics. I wanted to describe the current state of knowledge of fundamental physics and to give the reader some idea of the directions in which further progress might be expected. At that time string theory had just become fashionable (for the second time), and I was considering whether to include a section explaining what it was all about. No, I decided, it will all blow over in a couple of years. But those years stretched into decades, and string theory showed no signs of blowing over. Now, at last, here comes Peter Woit to reassure me



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by

is

around rather erratically. An audience that needs to be told about guanta of energy is nevertheless expected to know about synchroton radiation and bottom quarks without further explanation. But the ground is covered, and there is a lovely story about John Ellis and penauins.

This brings us to the mid-1970s and the emergence of the standard model, a symmetry-based quantum field theory unifying all the constituents of matter and (with just one exception) the forces which give rise to all the geological, biological, chemical and nuclear behaviour of the matter we see (and that which is too small to see). This is a staggering scientific achievement. But there is that one exceptional force: gravity, which has its own uniquely beautiful theory, due to Einstein, but seems to stand proudly aloof from any relationship with the other forces. Forging this relationship is the final challenge to fundamental physics. Enter, in the 1980s, superstring theory, with the promise that one-dimensional objects moving in ten dimensions can do what point particles cannot. Ironically, string theory arose from a radical programme of basing fundamental physics on a denial that there were any fundamental constituents. Woit enjoys beating up those physicists and popularisers who have not acknowledged that this programme is defunct, while cheering those who drew string theory out of it and, a decade later, moulded it into a potential theory of everything. He pays particular homage to the peculiar mathematico-physical genius of Edward Witten. But now he is disillusioned. Over twenty years of increasingly barogue development, and nothing to show for it - no viable theory, no hope of testable predictions; it's not science, it's science fiction. Worse, he protests, no chance is offered to any other ideas. If you want to be a theoretical physicist. you are not allowed to do anything but string theory. He sees the common plea "It's the only game in town" as a sinister threat rather than a cry of despair.

To a mathematician, particularly to a British mathematician, this all looks a bit odd. "Nothing to show for twenty years' work!" what, only twenty years? "No predictions that can be tested in the real world!" - who cares, as long as it's interesting? Woit does consider the possibility that superstring theory should be valued as mathematics, but he brushes it aside; it (as opposed to the geometry it fertilises) just doesn't look like mathematics. And anyway, they do it in physics departments. But in the country of Newton and Dirac, it's done in mathematics departments, and what matters is to have beauty in your equations. No, it doesn't have theorems with rigorous proofs; but it does have interesting conjectures and mathematical imagination. It may well be science fiction; that's what mathematical physicists do.

So it seems that it's not the book for me. after all. All it has done is to make me wish I worked in string theory. Perhaps the string theorists should use it for recruitment.

> Tony Sudbery University of York



for diligently working on one problem for 25 years without coming up with anything."

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Memphis by Béla Bollobás, Cambridge University Press, 2006, £19.99, ISBN 0-521-69395-0.

Problem-solving is at the heart of mathematics: we learn to do the subject by solving problems, and we teach it by posing them. However, if we are honest about it, whether at university or school we increasingly teach our students simply to solve the type of problems which we have already taught them how to solve, and we rarely challenge their ingenuity by confronting them with the unfamiliar. "It's not fair, we haven't been told how to solve problems like that" is one of the most depressing complaints a teacher is likely to hear. Unfortunately, in the real world problems rarely arrive with broad hints ("hence or otherwise") on how to solve them, and some originality is usually required. It is debatable whether the average UK mathematics graduate can cope with this, after five years of an increasingly conservative and utilitarian A-level and undergraduate syllabus. This is not the place to discuss such trends, but those who deplore them will enjoy Béla Bollabás's

Its subtitle.

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Béla Bollobás THE Art OF **Mathematics** Coffee Time in Memphis

latest book.

The Art of Mathematics: Coffee Time in sion in the author's office, with coffee and chocolate provided as performance-enhancing stimulants. This book is a collection of such problems. First Bollobás poses 157 problems, ranging widely in difficulty and subject-matter, though many come from combinatorics or geometry. He then gives some brief hints, for those who need them, and finally the bulk of the book consists of solutions (often more than one), usually in the form of theorem and proof. In most cases there is a discussion of the history of the problem, with references to the literature and comments about further generalisations and developments. A typical example is a deceptively simple-looking problem on the psychology of batting averages, which gradually expands, via the Hardy-Littlewood maximal theorem, into an inequality in complex function theory.

> Bollobás quotes Hilbert on how the professional mathematician can use problems such as these to test "the temper of his steel". It is entirely appropriate for the author, an expert fencer, to use this metaphor, and indeed the analogy between problem-solving and fencing is very apt: both require agility and ingenuity, of mind or body respectively, and both serve as safe, formalised and competitive testing-grounds for techniques required in other more serious contexts.

title. offers The book is dedicated to two great proban esoteric lem-posers, Paul Erdös and J.E. Littlewood, and the influence of the Hungarian and clue to its Cambridge problem-solving traditions infuscontents: lunchtime es its pages. Bollobás had the perfect start to for mathea mathematical career, namely an introducmaticians at tion as a teenager to Erdös, who delighted in the Univertreating young people to a variety of beautiful and fascinating problems. Many of those sity of Memproblems appear here, as do others posed by phis is traditionally fol-Littlewood, and some have been used by lowed by a Bollobás as intellectual hand grenades tossed probleminto the laps of his Trinity undergraduates solving sesand scholarship candidates.

This book is for occasional dipping into, not for systematic reading. To guote the preface 'The reader should pick out a problem or two to think about: if the problem is solved easily, fine, the next problem can come; but if it resists the initial attacks, the reader is likely to be even better off, for then the eventual solution (whether read or discovered) will be more pleasurable and beneficial.'

## **CONFERENCE FACILITIES UPDATE**

The LMS Conference Facilities at De Morgan House are now well and truly up and running. So far we have hosted training days, press conferences, lectures, and evening receptions from organisations as diverse as LSE. Great Ormond St Hospital, Proctor & Gamble and the Management Centre. Of course, most importantly we now have a much improved home for our own Society events and have been able to combine lectures with evening receptions and formal dinners at De Morgan House where previously we had to use other venues.

One significant development since the launch of the new facilities has been the partnership with University of London Senate House catering team Macmillan's who were chosen to be the sole caterer for De Morgan House. With prices that do not stretch some of the academic and charitable organisations that use DMH, and menus that can cater for the smallest sandwich lunch to cooked formal dinners, the catering has so far been a universal success.

I strongly recommend this delightful book, not least for the charming sketches by the author's wife Gabriella. Here's one of the problems (a classic) to whet your appetite: given a finite set of points in a Euclidean space, not all on a line, there is a line that contains exactly two of the points. Have fun!

> Gareth Jones University of Southampton

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Audio-Visual facilities have also been upgraded including the installation of a ceiling-mounted digital projector in the Hardy Room and additional screens in the Sylvester and Burnside rooms. Each room now has digital projection facilities available and access to our wireless network.

Bookings continue to be taken at a pace and the 2007 diary is filling up guickly. There are still dates free however so please spread the word and get in touch with Dominic or Lee-Anne on 020 7927 0800 or roombookings@demorgan house.co.uk if you need space for a central London meeting or event. Any charitable and academic organisations making a booking for purposes in line with the Society's charitable objects qualifies for our discounted rate.

A reminder of room capacities and rates for 2007 is set out below. For more detailed information please visit the Room Hire page on the LMS website or go straight to www.demorganhouse.co.uk.

	Hardy Room	Sylvester Room	Burnside Room	Cayley Room
Lecture	70	n/a	n/a	n/a
Boardroom	30	12	12	10
Classroom	28	10	10	n/a
Daily rate	£365	£210	£210	£210
Discounted rate*	£160	£100	£100	£100

\* discounted rate applies to any charitable and academic organisations for purposes in line with the Society's charitable objects

### NEWSLETTER

### ISAAC NEWTON INSTITUTE FOR MATHEMATICAL SCIENCES

## EXPLORING QCD: DECONFINEMENT, EXTREME ENVIRONMENTS AND HOLOGRAPHY

### (20-24 August 2007)

in association with the Newton Institute programme entitled Strong Fields, Integrability and Strings (23 July to 21 December 2007)

Workshop organiser: Nick Evans (Southampton), Simon Hands (Swansea) and Mike Teper (Oxford)

Theme of workshop: QCD is the accepted theory of the strong interaction, but fundamental questions remain unanswered, eg. the dynamics behind the confinement of colour and generation of a mass gap; the behaviour of the spectrum as either temperature is raised, or the number of colours or supersymmetries is varied; the ground state of matter at high baryon density.

Interest in these questions is as topical now as at any time in the last 25 years, driven by the heavy-ion collision experimental programmes at RHIC and LHC; the advent of Teraflop-scale computer resources enabling systematic and quantitative approach to QCD beyond perturbation theory; and dramatic theoretical progress in non-perturbative gauge theory exploiting a conjectured duality between gauge theory and gravity, which promises to fulfil a longstanding dream of finding a theoretical description of the QCD string.

The workshop's aim is to initiate and sustain a dialogue between different communities of researchers, with the aim both of reviewing and communicating progress, and of suggesting new and fruitful directions for collaborative exploration.

Invited speakers: Ofer Aharony (Weizmann Institute), Johanna Erdmenger (MPP Munich), Philippe de Forcrand (ETH Zurich), Clifford Johnson (Southern California)\*, Frithjof Karsch (Brookhaven National Laboratory), Mikko Laine (Bielefeld), Aneesh Manohar (San Diego)\*, Rob Myers (Perimeter Institute)\*, Horatiu Nastase (Brown), Peter Petreczky (Brookhaven National Laboratory), Rob Pisarski (Brookhaven National Laboratory), Alex Pomarol (UAB Barcelona), Krishna Rajagopal (MIT), Francesco Sannino (NBI Copenhagen), Thomas Schaefer (North Carolina), Edward Shuryak (SUNY Stony Brook), Andrei Starinets (Perimeter Institute), Misha Stephanov (Illinois), Guy de Teramond (Costa Rica), Jac Verbaarschot (SUNY Stony Brook) and Laurence Yaffe (Washington).

\* to be confirmed

**Location and cost:** The workshop will take place at the Newton Institute and accommodation for participants will be provided in a single study bedroom with shared bathroom at Wolfson Court. The workshop package, costing £450, includes accommodation, breakfast and dinner from dinner on Sunday 19 August to breakfast on Saturday 25 August 2007, and lunch and refreshments during the days that lectures take place. Participants who wish to attend but do not require the workshop package will be charged a registration fee of £90. Self-supporting participants are very welcome to apply.

Further information and application forms are available from the web at: www.newton.cam.ac.uk/ programmes/SIS/sisw01.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.

Closing date for the receipt of applications is **31 May 2007**.



The London Mathematical Society



## Fusion Systems

LMS-EPSRC Short Course

University of Birmingham, 31 July – 4 August 2007 Organisers: Chris Parker & Sergey Shpectorov

Fusion systems are mathematical objects that bring together groups and their representations and algebraic topology. This course aims to introduce students to the general theory behind fusion systems by presenting them simultaneously from a group theoretic, representation theoretic and topological point of view. The course consists of three series of five lectures as follows:

- Michael Aschbacher (Caltech) Local theory of saturated fusion systems and p-local finite groups
- Radha Kessar (Aberdeen) Modular representation theory, blocks and fusion system
- Bob Oliver (Paris) Topological aspects of fusion systems

Two guest lectures will be given on Friday 4 August:

- Carles Broto (Barcelona) Homotopy theory and p-local groups
- Markus Linckelmann (Aberdeen) On control of fusion

The course will be particularly valuable to postgraduate students studying group theory, representation theory or algebraic topology. More specific details about the course including the registration fees and the content of the lectures can be found at our website:

http://web.mat.bham.ac.uk/C.W.Parker/Fusion/Imsfusion.htm.

The number of people admitted to the course will be limited and so applications should be made using the online registration form available on the London Mathematical Society's website at:

www.lms.ac.uk/activities/rmc/sc/36poster.html.

The closing date for online registration is Friday 25 May 2007.

### About the Short Courses

The principal aim of the courses is to provide training for postgraduate students in core areas of mathematics. The courses are intended to provide high quality courses for graduate students from around the country in an effective and efficient manner. 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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### ISAAC NEWTON INSTITUTE FOR MATHEMATICAL SCIENCES

## EMBO WORKSHOP ON CURRENT CHALLENGES AND PROBLEMS IN PHYLOGENETICS

### (3-7 September 2007)

in association with the Newton Institute programme entitled *Phylogenetics* (3 September to 21 December 2007)

Sponsored by: European Molecular Biology Organisation (EMBO)

Principal organiser: Vincent Moulton (University of East Anglia)

**Organisers:** Brent Emerson (University of East Anglia), Daniel Huson (Tuebingen University) and Mike Steel (University of Canterbury)

Theme of workshop: Phylogenetic trees and networks are central to modern molecular evolutionary biology, with applications ranging from the origin of viruses (e.g. HIV, influenza) to modelling plant and animal radiations. As biologists attempt to reconstruct larger slices of the 'tree of life' using increasingly complex data, and incorporating more accurate models of molecular evolution, mathematics (and its sister fields, statistics and computer science) is increasingly being seen as an essential tool.

This workshop will showcase some of the recent achievements, challenges and new problems that arise in using mathematical approaches to understand molecular evolution. Topics covered will include: phylogenomics, molecular epidemiology, genetic biodiversity and phylogeography, processes of reticulate evolution (such as horizontal gene transfer), haplotype mapping by perfect phylogeny, population genetics in phylogeny, and metagenomics.

In addition this workshop will launch (and set the agenda for) a 4-month workshop of collaboration and research at the Isaac Newton Institute for Mathematical Sciences in a program on Phylogenetics, which will bring mathematicians and biologists together to develop new approaches in molecular phylogenetics.

Invited speakers: J. Felsenstein (Washington), O. Gascuel (LIRMM), J. Hein (Oxford), J. Kim (Pennsylvania), W. Martin (Heinrich-Heine), A. Mooers (Simon Fraser), L. Pachter (UC Berkeley), A. Rodrigo (Auckland), A. von Haeseler (Duesseldorf) and T. Warnow (Texas).

Location and cost: The workshop will take place at the Newton Institute and accommodation for participants will be provided in a single study bedroom with shared bathroom at Wolfson Court. The workshop package, costing £450, includes accommodation, breakfast and dinner from dinner on Sunday 2 September to breakfast on Saturday 8 September 2007, and lunch and refreshments during the days that lectures take place. Participants who wish to attend but do not require the workshop package will be charged a registration fee of £90. Self-supporting participants are very welcome to apply.

Further information and application forms are available from the web at: www.newton.cam.ac.uk/programmes/PLG/plgw01.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.

Closing date for the receipt of applications is 15 June 2007.

## **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/meetings/calendar.html).

### **MARCH 2007**

4-7 21st Century Mathematics Conference, Lahore (353) 14 Postgraduate Open Day, Loughborough (357) 14 Combinatorics Meeting, Oxford (357) 16 Edinburgh Mathematical Society Meeting, Dundee (350) 19-21 Journal of Topology Launch Meeting, Oxford (357) 22 & 23 Fascinating Fractions, Cambridge (356) 23 Karl Pearson Sesquicentenary Conference, RSS, London (357) 26 Geometric Analysis Spitalfields Day, Warwick (357) 26-30 Number Theory and Random Phenomena Workshop, Bristol (357) 26-30 Theory of Highly Oscillatory Problems Workshop, INI, Cambridge (353) 26-31 Geometric Flows and Related Topics Symposium Workshop, Warwick (350) 27-30 Probability and Statistics Conference, Durham (357)

### **APRIL 2007**

10-14 LMS Invited Lectures, The Geometric Langlands Correspondence, Oxford (355)
11-13 Postgraduate Group Theory
Conference, Cambridge (355)
15-20 An Introduction to Multiscale
Methods, LMS-EPSRC Short Course,
Warwick (356)
16-19 BMC, Swansea (357)
17-19 BAMC, Bristol (354)
20 LMS Midlands Regional Meeting,
Loughborough (357)

24 David Crighton Lecture, London (357)
27 Edinburgh Mathematical Society Meeting, Stirling (350)
27 Women in Mathematics Day, De Morgan House, London (357)

### MAY 2007

18-19 Groups in Galway Conference, Galway (357)
18-20 Midwest Geometry Conference, Iowa, USA (350)
22 Multiplying and Dividing Whole Numbers, Gresham College London (355)
25 Edinburgh Mathematical Society Meeting, Aberdeen (350)
29-1 Jun Applied Stochastic Models and Data Analysis Conference, Crete, Greece (355).
30 LMS South West & South Wales Regional Meeting, Cardiff

### **JUNE 2007**

2-9 Symmetry and Perturbation Theory Conference, Otranto, Italy (356)
18-19 Hamiltonian Dynamical Systems and Applications Seminar, Montreal (355)
18-22 Cherednik Algebras Workshop, ICMS, Edinburgh (357)
22 LMS Meeting, London
30 Euler's Mathematical Legacy Meeting, Oxford (356)
30-4 Jul Geometry of Riemann Surfaces Conference, Crete (356)

### JULY 2007

2-6 Journées Arithmétiques Meeting, Edinburgh (357)
2-6 Effective Computational Methods for Highly Oscillatory Problems Workshop, INI, Cambridge (353)
2-6 Applications of Multiscale Methods and Statistical Inference Course, London (357)
9-12 3-Manifold Geometry and Topology Symposium Workshop, Warwick (350)
9-12 Diophantine Equations via Analytic Number Theory Workshop, Bristol (357)

**R.S. BALL** LMS member 1873-1875 & 1885-1913



Sir Robert Stawell Ball, Kt, LLD, FRS, Hon FRSE, Hon FCPS, MRIA Andrews Professor of Astronomy in the University of Dublin Royal Astronomer of Ireland