



No. 396 October 2010

Society Meetings and Events

2010

Friday 19 November Annual General Meeting and Naylor Lecture, London [pages 1, 3]

2011

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Friday 25 February Mary Cartwright Lecture, Oxford

Tuesday 17 May LMS–Gresham Lecture, London

Friday 1 July London

Tuesday 19 July Northern Regional Meeting, Leeds

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ANNUAL GENERAL MEETING

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The Annual General Meeting of the Society will be held at 3.15 pm on Friday 19 November 2010 at University College London. The business shall be:

- (i) the adoption of the Annual Report for 2009/10
- (ii) the report of the Treasurer
- (iii) appointment of Auditors
- (iv) elections to Council and Nominating Committee
- (v) presentation of certificates to LMS prizewinners

It is hoped that as many members as possible will be able to attend. Fiona Nixon

Executive Secretary

2010 ELECTIONS TO COUNCIL AND NOMINATING COMMITTEE

The ballot papers for the November elections to Council and Nominating Committee are being circulated with this copy of the *Newsletter*.

There are two candidates for the post of Education Secretary. Eight candidates for Members-at-large of Council are proposed by the Nominating Committee and one further has been nominated directly, for six vacancies. Four names have been proposed by the Nominating Committee for two vacancies in the membership of the Nominating Committee. The slates for election were placed on the LMS website on 2 August 2010.

Please note that completed ballot papers must be returned by Thursday 11 November 2010.

A separate form on which to suggest names of potential candidates for the 2011 elections for consideration by Nominating Committee is also included. Members may also make direct nominations; details will be in the May 2011 *Newsletter* or are available from Duncan Turton at the LMS (nominations@lms.ac.uk).

LMS ANNUAL DINNER

The 2010 Annual Dinner will be held after the Annual General Meeting at 7.30 pm on Friday 19 November at The Russell Hotel. London WC1. The cost for members and their quests is £45 per person, which is for a threecourse meal and wine. Members wishing to attend should make cheques payable to 'London Mathematical Society' and also indicate if they have any dietary requirements and send to: Leanne Marshall, London Mathematical Society, De Morgan House, 57–58 Russell Square, London WC1B 4HS. Payment should arrive by Monday 8 November. Any queries should be sent to leanne.marshall@lms.ac.uk.



NEWSLETTER

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EDITORIAL

Keen readers of the on-line version of the LMS *Newsletter* may have noticed something different in recent days: news items, notices and contributed articles are published on the web first, in advance of the printed copy. Items are being posted on line as they become ready, with the most recent items appearing at the top of each webpage.

This is a first trial in what we expect to be a progression of changes to the *Newsletter* in order to distribute upto-date information more quickly to readers. The new on-line version of the *Newsletter* can be viewed at www.lms. ac.uk/newsletter.

> Tony Mann General Editor

CECIL KING TRAVEL SCHOLARSHIP 2010

The 2010 Cecil King Travel Scholarship has been awarded to Erik Pickett, a postdoctoral assistant at the École Polytechnique Fédérale de Lausanne. The London Mathematical Society makes the award of up to £5,000 annually to a young mathematician of outstanding promise, to support a period of study or research abroad for a typical period of three months. Dr Pickett will use the Scholarship to fund a visit to the University of Limoges to study algebra.

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

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

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ANNUAL LMS SUBSCRIPTION 2010–11

Members are reminded that their annual subscription, including payment for publications, for the period November 2010 – October 2011 is due on **1 November 2010**. By the second week of October members will be sent notification via email or letter, detailing how to pay their subscription. In the case of members who already have a Direct Debit set up, no action need be taken.

Rates

The annual subscription to the London Mathematical Society for 2010–11 is:

- Ordinary membership £51.50
- Concessions on Ordinary membership:
 Decimary interview C25, 75
 - Reciprocity £25.75
 - Career break or part-time working \pounds 13.50

Associate membership £13.50

Members also have the option to pay their European Mathematical Society subscription via the LMS (\pounds 23) and subscribe to the *Journal* of the EMS (\pounds 88).

The member prices of the Society's journals for 2011 are:

		FIIII	Online	Print+Online*
Bulletin		£53.00	£42.00	£64.00
Journal	£	101.00	£81.00	£121.00
Proceedings	£	106.00	£85.00	£127.00
Nonlinearity	(e>	cept N.	America) (N. America)
		£72	2.00	£93.00
JCM (electron	ic)	_	free	(+)
				(*inclusive of VAT)

Members now have the choice of taking an electronic subscription to the *Bulletin, Journal* or *Proceedings* of the LMS at a discount of 20% on the standard price for a print subscription. Alternatively, members may receive both the print and electronic versions for an additional 20% above the price of the print subscription. Once an order for an electronic version has been processed by the LMS, your email address will be passed to Oxford University Press who will contact you with details on how to access the journals.

Isabelle Robinson Group Head (Society & Grants)

SYLVESTER MEDAL

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The Royal Society has awarded the 2010 Sylvester Medal to Professor Graeme Segal, FRS for his highly influential and elegant work on the development of topology, geometry and quantum field theory, bridging the gap between physics and pure mathematics. The medal is named after James Joseph Sylvester who was Savilian Professor of Geometry, Oxford, in the 1880s and LMS President 1866–68.

KYOTO PRIZE

The 2010 Kyoto Prize in Basic Sciences for Outstanding Contributions to Mathematical Sciences Based on Discrete Optimization Algorithms has been awarded to Professor László Lovász (Eötvös Loránd University, Hungary). Through his advanced research on discrete structures, Professor Lovász has provided a link among various branches of mathematics in terms of algorithms, thereby influencing a broad spectrum of the mathematical sciences – including discrete mathematics, combinational optimization and theoretical computer science.

VISIT OF PROFESSOR S. PILIPOVIC

Professor Stevan Pilipovic will be visiting the UK from 20 November to 5 December 2010. He is an expert in the theory of generalised functions, partial differential equations, stochastic, and more general analysis. He is an Academician of the Serbian Academy of Arts and Sciences, and a Professor at the University of Novi Sad. Professor Pilipovic will give lectures at:

- The London Analysis Seminar
- Imperial College PDE Seminar
- University of Bath
- Heriot-Watt University

For further information contact Michael Ruzhansky (m.ruzhansky@imperial.ac.uk). The visit is supported by an LMS Scheme 2 grant.



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Production Factor Mathematics

M. Grötschel, K. Lucas, V. Mehrmann (Eds.)

This book examines the role of mathematics in the design of products and the layout of production processes and supply chains.

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2010. XIV, 402 p., Softcover

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G. L. Naber

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IAIN ADAMSON

Dr Iain T. Adamson, who was elected a member of the London Mathematical Society on 19 December 1957, died on 9 June 2010, aged 81.

Arthur Sands writes: Iain graduated from St Andrews University in 1950 and then went to Princeton University where he obtained his doctorate with Emil Artin as supervisor. In 1953 he joined the Mathematics Department at Queen's University, Belfast. After seven years he returned to his home town of Dundee to take up a lectureship at Queen's College which was soon to become the University of Dundee. He remained there as lecturer and senior lecturer until his retirement, apart from visits to the University of Western Australia where he met Robin who was to become his wife.

lain wrote three textbooks on algebra at honours/postgraduate level as well as translated books by Artin and by Hilbert. His main interests were in teaching but he also played a prominent role on Senate and on Court. He taught linear algebra successfully using the Keller Plan and was disappointed when the department did not take this further.

When staff were needed to teach Computing he switched mainly to this, but did so properly by taking an MSc by thesis at St Andrews. Then he wrote a textbook in this area. He also ran the departmental library, which contained more than 10,000 books as well as periodicals. During 1983–84 he was President of the Edinburgh Mathematical Society.

When calls for early retirement were made he accepted this, but returned to teach part-time as well as continued to run the library. Undoubtedly he gave much more than the 35% which was required in his contract. He also trained as an auxiliary Church of Scotland minister. Upon ordination he helped a full-time minister who had charge of four churches in the Carse of Gowrie, taking two services each Sunday.

After final retirement he returned with Robin to Western Australia. He is survived by her and by their daughter Margaret.

GRAHAM EVEREST

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Professor Graham R. Everest, who was elected a member of the London Mathematical Society on 18 November 1983, died on 30 July 2010, aged 52.

Thomas Ward writes: Graham's talent for mathematics took him to Bedford College and doctoral study under the supervision of Colin Bushnell at King's College London. He joined the University of East Anglia as a lecturer in 1983, and spent his whole career there.

His research appeared in the form of some 70 research papers and three monographs, and spanned diverse areas of number theory. Three themes informed his research. First, the impact of twentieth-century developments in Diophantine analysis and transcendence theory on counting problems and guestions in algebraic number theory. Second, the fascinating arithmetic properties of recurrence sequences, including classical guestions in the spirit of Mersenne, Lehmer, Zsigmondy and so on, as well as more modern developments on bilinear sequences and elliptic divisibility sequences. Third, Graham had an abiding interest in all aspects of the interaction between number theory and dynamical systems.

As a researcher Graham brought great joy and creativity to his work, and the generosity of his approach to mathematics will be familiar to his thirty co-authors. Graham was a dedicated teacher and supervisor, and many generations of students will remember the energy and enthusiasm of his lectures. His belief in the transforming power of higher education was recognized in the form of a UEA Excellence in Teaching award in 2005.

Graham is survived by his children James, Philip and Rebekah, and his wife Sue.

A memorial fund has been started in the School of Mathematics, the details of which are on the School's website at www.uea. ac.uk/mth/frontpage/grahameverest. A-l do ure

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MATHEMATICS POLICY ROUND UP

LMS Policy Position Papers

The LMS Research Policy Committee is preparing position and information statements intended to inform the upcoming International Review of Mathematics and beyond. The statements themselves may also be of interest to mathematics departments around the country. Three statements are in production and during September the Committee sent an open call to all those in the mathematics community interested in commenting on these statements.

- Facts and figures shows the current context of UK mathematical sciences.
- RAE-based funding of UK mathematical sciences research – shows the RAE mechanism and its operation. A separate paper on REF and 'impact' will follow once the timing and details are clearer.
- Doctoral training discusses the nature of UK doctoral training in mathematical sciences.

Mathematics A-level numbers continue to rise

The number of A-level mathematics entries across the UK is up 6.2% on last year, with 77,001 students sitting the exam. This is a greater percentage increase than other STEM subjects – physics up 5.2% (to 30,976), biology up 4.3% (to 57,854) and chemistry up 3.7% (to 44,051).

Figures released by the Joint Council for Qualifications also show that:

- A-level further mathematics has continued to rise in popularity, with entries increasing by 11.5% (to 11,682)
- AS mathematics entries increased by 9.2% (to 112,847)
- AS further mathematics entries continued the trend, increasing by 13.1% (to 14,884) Since 2003 the number of students taking A-level further mathematics has more than doubled, from 5315 to 11,682, and the figure for AS further mathematics has roughly

trebled, standing at 14,884 in 2010. The LMS and IMA welcome this growth at A-level and AS, which are fundamental to providing a range of opportunities for young people in their future career choices.

Mathematics GCSE

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The number of GCSE mathematics entries across the UK is up 1.1%, to 762,792. Full tables of results are available on the Joint Council for Qualifications website at www.jcq.org.uk.

Comprehensive Spending Review

The government's Comprehensive Spending Review (CSR) will be published on Wednesday 20 October 2010 and will set out plans for the years 2011–12 to 2014–15. International development and NHS spending are protected and this means that the remainder of public spending needs to be cut by 25% to meet the Budget. This could have significant repercussions for the STEM community, with the potential for restructuring the landscapes of UK research and development, and education, for years to come. A copy of the CSR framework can be downloaded at www.hm-treasury.gov.uk/ d/spending_review_framework_080610.pdf

Leelavati Award

This award was presented to Simon Singh "for outstanding contributions to public outreach in mathematics by an individual". The award carries a citation and a cash prize of around US \$20,000, and was presented at the closing ceremony of the International Congress of Mathematicians (ICM) 2010 on 27 August.

Other ICM News

For the first time an International Conference of Women Mathematicians was held as part of the ICM. The next ICM will be held in Seoul, South Korea in 2014.

> Dr John Johnston Mathematics Promotion Unit

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LMS CONFERENCE GRANTS (SCHEME 1)

Grants are made to the organisers of conferences to be held in the United Kingdom, and may be used to cover the expenses of principal speakers, and to provide support for research students and for participants from Scheme 5 or former Soviet Union countries. Further information on the Society's grant schemes is available at www.lms.ac.uk/grants. In 2009–10 grants were awarded to support the following conferences:

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Conference	Dates, Place	Applicant	Grant
Techniques in Applied Fluid Dynamics and Diffusion Reaction Problems	11 Sep 2009, Leeds	D. Lesnic	£2,160
Aerodynamic Boundary Layers: Meeting in honour of the 75th Birthday of Professor Norman Riley	10–11 Dec 2009, East Anglia	M. Blyth	£1,970
One-Day Combinatorics Meeting	17 Mar 2010, Oxford	A. Scott	£2,050
Young Researchers in Mathematics	25–27 Mar 2010, Cambridge	I. Leader	£4,276
Geometric Model Theory	25–29 Mar 2010, Oxford	J. Kirby	£5,691
Workshop on Stochastics, Control and Finance	12–14 Apr 2010, Imperial College London	H. Zheng	£4,000
5th Conference on Theory of Quantum Computation, Communication and Cryptography	13–15 Apr 2010, Leeds	P. Crompton	£2,530
14th UK Meeting on Integrable Models, Conformal Field Theory and related topics	16–17 Apr 2010, Kent	C. Dunning	£1,970
Network Dynamics and Synchronization	17–19 May 2010, Manchester	P. Glendinning	£4,978
Stochastic Differential Equations: Theory, Numerics and Applications	19 May 2010, Swansea	C. Yuan	£2,000
Two linked one-day Combinatorics Colloquia	19–20 May 2010, QMUL and LSE	G. Brightwell	£1,400
Sheaves in Representation Theory	23–28 May 2010, Isle of Skye	I. Gordon	£5,444
Wales Mathematics Colloquium 2010	24–26 May 2010, Powys	D.H. Smith	£1,781
Banach Algebra and Operator Space Techniques in Topological Group Theory	27–29 May and 28-30 Jun 2010, Leeds	D. Salinger	£6,000

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Conference	Dates, Place	Applicant	Grant
Emerging Problems in Nonlinear Analysis and Differential Equations	1–4 Jun 2010, Glasgow	S. Pott	£4,750
Durham Conference on Geometry and Topology	20–22 Jun 2010, Durham	D. Schütz	£4,700
Partial Differential Equations and Fluid Mechanics 2010	5–9 Jul 2010, Warwick	J. Robinson	£5,360
Individual and Collective Fluid Mechanics of Swimming Microorganisms	6–8 Jul 2010, Glasgow	N. Hill	£4,000
Rigidity of Frameworks and Applications	12–15 Jul 2010, Lancaster	S. Power	£4,960
13th Galway Topology Colloquium	13–15 Jul 2010, Birmingham	C. Good	£3,006
Recent Trends in Applied Inverse Problems	19–20 Jul 2010, Birmingham	B. Johansson	£3,210
21st International Workshop on Combinatorial Algorithms	26–28 Jul 2010, London	C. Iliopoulos	£1,900
28th International Colloquium on Group-Theoretical Methods in Physics	26–30 Jul 2010, Newcastle upon Tyne	M. Angelova	£1,000
Algebra, Combinatorics, Dynamics and Applications	30 Aug – 2 Sep 2010, QUB	N. lyudu	£5,200
Models in Population Dynamics and Ecology 2010: Animal Movement, Dispersal and Spatial Ecology	1–3 Sep 2010, Leicester	S. Petrovskii	£5,000
British Logic Colloquium	2–4 Sep 2010, Birmingham	E. Ritter	£2,430
Scottish Computational Mathematics Symposium 2010	6 Sep 2010, Heriot-Watt	D. Duncan	£3,360
18th Annual European Symposium on Algorithms (ESA)	6–8 Sep 2010, Liverpool	I. Potapov	£4,210
25th British Topology Meeting	6–8 Sep 2010, Oxford	J. Giansiracusa, O. Randal- Williams	£5,000
Function Theory and Dynamical Systems (incorporating the One-Day Function Theory Meeting)	6–9 Sep 2010, UCL	R. Halburd	£5,000
Analytic and Asymptotic Approaches to Problems in Applied Mathematics	10 Sep 2010, Manchester	J. Merkin	£1,385

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Conference	Dates, Place	Applicant	Grant
Anglo-Belgian Workshop on Model Theory and Application (2)	13–14 Sep 2010, QMUL	I. Tomašić	£3,300
Mathematical Modelling in Biology	14 Sep 2010, Strathclyde	Х. Мао	£2,150
Algorithms and Complexity in Durham 2010	20–22 Sep 2010, Durham	I. Stewart	£2,905
Statistical Properties of Rare Events	27–28 Sep 2010, Exeter	M. Holland	£2,750
Birational Geometry	6–10 Dec 2010, Edinburgh	I. Cheltsov	£4,000
New Trends in Spectral Theory and Applications	18–20 Dec 2010, Cardiff	I. Wood	£6,000
Representations of Surface Groups and Higgs Bundles	14–18 Mar 2011, Oxford	P. Newstead	£4,000
Nonlinear Waves and Solitons on Lattices	4–5 Apr 2011, Edinburgh	J. Wattis, G. Lord	£4,400
British Mathematical Colloquium (2011)	18–21 Apr 2011, Leicester	J. Hunton	£10,000
The Birch and Swinnerton-Dyer Conjecture	2–4 May 2011, Cambridge	T. Dokchitser	£3,500
Nonlinear Diffusion: Algorithms, Analysis and Applications	6–8 Jun 2011, Warwick	A. Stuart	£3,790
New Developments in Noncommutative Algebra and its Applications	26 Jun – 2 Jul 2011, Isle of Skye	U. Krähmer	£5,000

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EUROPEAN WOMEN IN MATHEMATICS GENERAL MEETING

For more than 20 years the European Women in Mathematics (EWM) association has organized biennial conferences which are open both to members and to non-members of EWM. The most recent, the 14th General Meeting, was held in Novi Sad, Serbia from 25 to 28 August 2009, and the 13th General Meeting took place in September 2007 at the University of Cambridge, UK. The 15th EWM General Meeting will be hosted by the Centre de Recerca Matemàtica (CRM) at the Universitat Autònoma de Barcelona from 5 to 9 September 2011. The programme will begin mid-morning on Monday 5 September and will finish at lunchtime on Friday 9 September 2011. More details will be available soon on the EWM and CRM websites at www.europeanwomeninmaths. org and www.crm.es.

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EWM/EMS SCIENTIFIC COMMITTEE: Ulrike Tillmann (Oxford, UK: Chair), Viviane Baladi (ENS, Paris, France), Eva Bayer-Fluckiger (Lausanne, Switzerland), Christine Bernardi (Paris VI, France), Christine Bessenrodt (Hannover, Germany), Antonella Grassi (U Penn, USA), Ursula Hamenstädt (Bonn, Germany), Dusa McDuff (Stony Brook, USA), Ragni Piene (Oslo, Norway), Vera Sòs (Renyi Institute, Budapest, Hungary), Nina Uraltseva (St Petersburg, Russia), Michèle Vergne (Ecole Polytechnique, Paris, France)

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AN INDIAN SUMMER

Readers will know that the International Congress of Mathematicians (ICM), which takes place every four years, was held from 19 to 27 August 2010 in Hyderabad in the state of Andhra Pradesh in southern India; there were many related activities and satellite meetings. Here we give a few personal comments. (Full records of prize winners, decisions taken and main talks are easily available on the appropriate websites, and so we shall not repeat these here.)

Garth Dales (HGD) started in Bangalore as a speaker at the satellite meeting on Functional Analysis, held at ISI (Indian Statistical Institute); speakers were housed at the IISc (Indian Institute of Science) and also in Bangalore (but rather a long bus journey from ISI). The campuses of ISI and IISc are oases of green peace in a vibrant, rapidly growing city of traffic chaos. Such Institutes, together with the IITs (Indian Institutes of Technology) and some other institutes, are quite well funded by the central Indian government and function throughout in English; they are centres of research excellence; competition to enter as an undergraduate is intense, and the students seem to be extremely able, enthusiastic and hard working. A problem for the country is that some 70% of the graduating students from IITs leave immediately, often for the US, a brain-drain for the country.

Colva Roney-Dougal (CMRD) together with Stephen Huggett, Elizabeth Mansfield, Angus Macintyre and John Toland were the LMS delegates to the General Assembly of the IMU (International Mathematical Union) in Bangalore. Several key decisions were taken at this meeting: we congratulate John Toland, a former President of the LMS, on being elected to the Executive Committee of the IMU; the IMU has decided to establish the permanent home of its secretariat in Berlin at the Weierstrass Institute for Applied Analysis and Stochastics; the next ICM, in 2014, will be held in Seoul, Republic of Korea. HGD visited the leading state university, Sardar Patel, in Gujarat – and saw the celebrationsfor India's National Dayon 15 August. This university teaches in English a two-year MSc, at about the level of our MMath, to selected students who have graduated from one of about 25 three-year feeder colleges. Over

the past few years there has been an explosion of private, English-medium schools in the state, these being much sought after by the increasing Indian professional class, and so the education system is tending to bifurcate into one set of schools for the middle class and another for the poor.

We then assembled in the city of Hyderabad, a city of 10 million people, historic, but now rapidly expanding and changing, with gleaming new buildings, crowded and chaotic roads, thronged with people, and some dire poverty. The convention

Ingrid Daubechies (President-elect of the I President 2003–2006) and John Toland

centre was some way from the city, and travel required a complex system of buses that sometimes worked; the buses had to fight crowded roads and some flooding after heavy rain, at the tail end of the monsoon.

There were about 3,000 registered delegates, with about half of these from India. Sadly there were only two delegates from Pakistan, apparently an intrusion of politics: many intended delegates had problems with visas, despite the best efforts of the local organizers. There were about 70 delegates from the UK, of whom about 40 were mathematical colleagues from UK universities. Some UK participants were able to attend because they were supported fav wa: sub ma wir as v and Pro be the C wir fro imp Ple





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by a Royal Society International Travel Grant; 17 delegates were supported by the LMS, at a cost of £10,500. This seems rather a modest representation, perhaps reflecting limited financial support.

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The opening ceremony of the ICM, attended by the President of India, was impressive: CMRD's



es (President-elect of the IMU) in conversation with John Ball (left; IMU I3–2006) and John Toland (elected to the IMU Executive Committee).

vel	favourite quotation from the President's speech
ne-	was "Mathematics is not a science; but no other
led	subject can lay claim to being a science unless
at	mathematics is involved". Here the Fields Medal
	winners were announced and congratulated,
es,	as were the winners of the Nevanlinna, Gauss
ere	and (new) Chern Prizes. It was announced that
ar-	Professor Ingrid Daubechies of Princeton will
led	be the next President of the IMU; she will be
he	the first female President.
ere	One-hour lectures were given by the prize
om	winners and by 19 Plenary Lecturers, none

winners and by 19 Plenary Lecturers, none from the UK. The State of California may be imploding financially, but it still provided five Plenary Lecturers.

Let us mention just three lectures. First, W. Hugh Woodin of Berkeley gave a very impressive talk on set theory, the limitations of ZFC, the independence of 'most' theorems of mathematics, and a possible (and possibly controversial) manner of resolving whether CH is 'true'. Second, Kim Plofker of Union College, New York, gave a remarkably articulate talk on Indian mathematics and the assimilation of 'foreign mathematics' both in and from India. Third, Irit Dinur from the Hebrew University of Jerusalem gave a fascinating talk on fixed length proofs of membership problems in NP. including a memorable analogy of 'spreading jam blindfolded' to describe a process for colouring graphs which demonstrates over a fixed number of vertices whether or not the graph is 3-colourable.

There were about 150 Invited Lectures of 45 minutes each, and of these 12 were by colleagues based in the UK. They were David Benson (Aberdeen), Marianna Csörnyei (University College London), Iain Gordon (Edinburgh), Roger Heath-Brown (Oxford), Marc Lackenby (Oxford), Philip Maini (Oxford), Marc Lackenby (Oxford), Philip Maini (Oxford), Peter Markowich (Cambridge), Oliver Riordan (Oxford), Gregory Seregin (Oxford), Richard Thomas (Imperial College London), Dmitry Turaev (Imperial College London) and Xunyu Zhou (Oxford).

There were about 750 'short communications' of 15 minutes each, apparently by self-elected speakers. Our (admittedly sparse) sampling of these suggests very varied quality of content and exposition; maybe in future there should be some attempts at quality control and efforts to persuade strong mathematicians to offer such communications.

There were various panel discussions. One, on *Mechanisms for strengthening mathematics in developing countries*, was organized by the LMS and ably chaired by our President, Angus Macintyre. It described our Mentoring African Mathematicians programme. The meeting was an opportunity for members to sign the famous LMS membership book; we are pleased that Ingrid Daubechies was among

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those who did. This was followed by the traditional LMS reception.

Another panel discussed the use of metrics for evaluating research and journals; the asinine 'Impact factor', run by a company for commercial purposes, was excoriated as it stands, but there was debate whether we should abjure such metrics altogether or try to devise better ones; an IMU panel is considering the latter alternative.

Other attractive activities included a popular lecture by Simon Singh (unfortunately clashing

with the LMS meeting), performances of Indian dance and music and talks on this, the play *A Disappearing Number* based on the story of Hardy and Ramanujan, and a simultaneous chess match between world champion Vishwanathan Anand and 40 selected mathematicians; Anand won 39 games and drew 1.

The booth of the LMS, ably staffed by Fiona Nixon, Susan Hezlet, Susan Oakes and various Council members, was very active.

> H. Garth Dales, Leeds Colva M. Roney-Dougal, St Andrews

RECORDS OF PROCEEDINGS AT MEETINGS

ORDINARY MEETING

held on *Wednesday 25 August 2010* at the Hyderabad International Conference Centre, during the International Congress of Mathematicians. About 130 members and visitors were present. The meeting began at 5.00 pm, with the President, Professor A.J. MACINTYRE, FRS, FRSE, in the Chair.

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Seven members signed the book and were admitted to the Society.

The President, on Council's behalf, announced that Professor Yvonne Choquet-Bruhat of Université Pierre et Marie Curie and Professor Terence Tao of the UCLA had accepted Honorary Membership of the Society.

A discussion meeting was held on *Mechanisms for strengthening mathematics in developing countries*. The panellists were:

- Angus Macintyre (Chair), President of the LMS
- John Ball, member of the MARM Board
- Frank Neumann, an experienced mentor in the MARM scheme
- Wandera Ogana, Chair of the AMMSI Programme Committee
- Angel Pineda, active in the Volunteer Lecturer Program
- Ramadas Ramakrishnan, Acting Head of Mathematics at ICTP
- Felix Shu, a mathematician at the University of Buea, Cameroon

An account of the discussion meeting will appear in Volume 1 of the *Proceedings of ICM 2010*.

After the meeting, the Society held a reception for its members and guests which provided an opportunity for overseas members to meet other members of the Society. There were 120 members and guests present, including representatives of many other mathematical societies, members of the IMU Executive Committee, and a Fields medallist. Professor Macintyre gave a warm welcome to all.

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Formal Aspects of Computing Science Specialist Group



BCS-FACS EVENING SEMINAR

A joint event with the London Mathematical Society

Professor Peter O'Hearn (Queen Mary, University of London) Reasoning about programs using a scientific method

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Tuesday 16 November 2010, 6.00 pm London Mathematical Society, 57–58 Russell Square, London WC1B 4HS



Reasoning about programs has traditionally been done using deductive reasoning, where mathematical logic is used to make proofs that connect programs with specifications. In this talk Professor O'Hearn describes an approach where an automated reasoning tool approaches program code as a scientist would the natural world. Instead of just deductive logic, versions of abductive reasoning (generation of new hypotheses) and inductive generalization are used in an iterative fashion to discover specifications that describe what programs do, starting from bare code. The resulting specifications are partial or conservative, but the inference/discovery aspect makes it much easier to approach large code bases, quickly, than with the traditional deductive-only approach. Professor O'Hearn reports on experience using a software tool – Abductor, which automates the method – on large open-source code bases, and he speculates on the potential role of an 'automated scientific method' in program verification and design.

This talk is based on joint work with Cristiano Calcagno, Dino Distefano and Hongseok Yang.

Refreshments will be available from 5.30 pm.

The seminar is free of charge and open to everyone. If you would like to attend, please confirm by email to paul.boca@googlemail.com by **12 November**.

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BIRATIONAL GEOMETRY

A workshop on *Birational Geometry* will take place at the International Centre for Mathematical Sciences, Edinburgh, from 6 to 10 December 2010. The workshop will be held in honour of Slava Shokurov's 60th birthday. The following invited speakers have confirmed that they will give talks:

- Valery Alexeev (Georgia, USA)
- Fedor Bogomolov (Courant)
- Alexey Bondal (Aberdeen)
- Jean-Pierre Demailly (Grenoble)
- Simon Donaldson (Imperial College)
- Osamu Fujino (Kyoto)
- Ludmil Katzarkov (Vienna)
- Yujiro Kawamata (Tokyo)
- Kenji Matsuki (Purdue)
- James McKernan (MIT)
- Shigefumi Mori (RIMS)
- Viacheslav Nikulin (Liverpool)
- Mihai Paun (Nancy)
- Yuri Prokhorov (Moscow State)
- Miles Reid (Warwick)
- Nick Shepherd-Barron (Cambridge)
- Yum-Tong Siu (Harvard)
- Gang Tian (Princeton)
- Burt Totaro (Cambridge)
- Hajime Tsuji (Sophia)

• Claire Voisin (Jussieu)

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- Shing-Tung Yau (Harvard)
- Yuri Zarhin (Penn State)

The organizers of the workshop are Ivan Cheltsov (Edinburgh) and Caucher Birkar (Cambridge). The workshop is supported by the ICMS and an LMS Conference grant. For further details visit the website at www.icms. org.uk/workshops/birational.

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THE FIELDS INSTITUTE

The following major programmes are scheduled at the Fields Institute, Toronto:

- Asymptotic Geometric Analysis (July – December 2010)
- Dynamics and Transport in Disordered Systems (January – June 2011)
- Discrete Geometry and Applications (July – December 2011)
- Galois Representations (January June 2012)
- Forcing and its Applications (July – December 2012)

See www.fields.utoronto.ca/programs/scientific for links to these and the many other upcoming workshops, conferences, etc. To be informed of upcoming Scientific Activities, subscribe to the mailing list at www.fields. utoronto.ca/maillist.



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UK–JAPAN WINTER SCHOOL 2011

The UK–Japan Winter Schools have been held since 1999. The aim of the School is to bring together Japanese and UK scientists, in particular young researchers and students, in a relaxing and stimulating atmosphere. The next UK–Japan Winter School will be held at King's College London from 10 to 13 January 2011 on *New Methods in Geometry*. There will be three short courses plus a number of individual talks. The courses are:

- Simon Donaldson (Imperial College London) Exceptional holonomy, gauge theory and calibrated geometry
- John Jones (University of Warwick) String topology
- Keiji Oguiso (Osaka University) Classification of general singular fibers of proper holomorphic Lagrangian fibrations via characteristic curves

For further information visit the website tinyurl.com/2uz2rdz.

MATHSJAM

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MathsJam will take place the weekend of 13 to 14 November 2010 at Yarnfield Park Training Centre, Staffordshire. It is an opportunity for like-minded self-confessed maths enthusiasts to get together and share stuff they like. Puzzles, games, problems, or just anything they think is cool or interesting. The programme is designed to maximise the number of ideas shared, while making the most of the opportunity to connect with others with similar interests. The event includes around 40 or 50 'lightning' talks, lunch both days, a threecourse dinner and accommodation.

For more information about the programme and to register visit the website at www. mathsjam.com. In particular you can read about the opportunities offered and the team behind the event (Colin Wright, David Bedford, James Grime, Matt Parker and Rob Eastaway).



Ammonite, by Simon Williams

REVIEWS

MATHEMATICS IN NATURE

Exhibition of photographs by Simon Williams, Ice House Gallery, Holland Park, London, 14–29 August 2010.

Simon Williams, who trained as a botanist, has an eye for patterns in nature, and fascinating mathematical structures abounded in this beautiful collection of photographs displaying Fibonacci numbers and fractals, symmetry and spirals. Over 3000 visitors saw the exhibition in its fortnight in London, apparently including one mathematics phobic who loved the pictures but shied away in horror from the explanatory mathematics books on display. Williams's subjects included fossils, broccoli and pineapple, ferns and orchids, and the one ma scu out larl hap ww the are pat The pro a c dis

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man-made artefact to feature, an impressive sculpture by Peter Randall-Page, was not at all out of place amongst these. The show particularly suited the interesting gallery space, but happily the images can also be seen online at www.southviewimages.co.uk. These images of the beauty of natural mathematical structures are inspiring and stimulating: on leaving the exhibition I found myself seeking out patterns as I walked through Holland Park. The photographs would look good – and provide food for thought for students – in a department of mathematics with suitable display space: an opportunity perhaps for a future showing of these fascinating images?

> Tony Mann University of Greenwich

Decoding Reality: The Universe as Quantum Information by Vlatko Vedral, 2010, Oxford University Press, 229 pp, £16.90, ISBN 978-01-9923769-2.

Vlatko Vedral takes on quite a job: his aim is to unify our understanding of the nature of reality through the notion of quantum information. All this in a popular science book. It is unsurprising to find that – for me at least – he is not entirely successful.

The book is split into three parts. In the first, Vedral introduces Shannon's classical notion of 'information'. He then considers this idea in a variety of differ-

ent settings – around questions of efficient communication (error correction, security), biology (DNA, evolution), physics (entropy), probability (betting) and sociology (social connectivity) – with a view to demonstrating how the notion of information can, in some sense, unify our understanding of these disparate areas.

Unfortunately the treatment is too much at the popular end of the popular science spectrum. Although I got the impression that everything discussed could be made rigorous, his unwillingness to use equations or diagrams of any sort left me in a fair fog.

In the second section he was substantially more successful – his explanation of the more general notion of 'quantum information' was clear and interesting. His discussion of ideas around randomness and its importance in connection with the theory of evolution, and with notions of free will, was stimulating and well written. Again equations, and particularly pictures, would have helped a lot but, still, I got the drift.

In the final section come the "big ideas": that the notion of quantum information can unify the theories of quantum mechanics and gravity, and can explain how the universe emerged out of the void (*creation ex nihilo*). Unfortunately the fog was back. Although his explanation of theories around creation ex nihilo, in particular, was interesting, I was

left frustrated. I really wanted to understand more!

I have two remaining criticisms. The first pertains to an aside in Chapter 5 where Vedral spends a couple of pages discussing global warming, and its inevitability in light of the second law of thermodynamics. I have no doubt that everything Vedral wrote here is entirely correct but of course his notion of global warming is not at all what is meant when we read the phrase in the popular

media. Given the importance of global warming (as popularly understood), and given the vast amount of misinformation around the same, it seems vital that science writers treat this subject with particular care. Best not to muddy the waters with new definitions.

My last criticism is philosophical. At one point in the book, Vedral writes "physicists are not as witty as playwrights, but ... they probably have a deeper insight into the behaviour of the universe." Oh dear, thought I,

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If the physicist's role is to shed light, then the playwright's is to move through the darkness that remains. Their activities are complementary: one goes where the other cannot, both (potentially) bringing rich insight into the human situation. Crucially, too, both have an important aesthetic role in human life.

The aesthetic of the physicist is one of simplicity; hence the rhythm and movement of this book is ever towards 'reduction': towards simpler theories explaining more phenomena. The reduction so described is impressive but – for me – Vedral's presentation lacked an appreciation of the aesthetic implications of such a process. I want my reality to be more than impressive, I want it to be beautiful, I want it to move me. Whilst Vedral's presentation is erudite and engaging it wasn't, for me, beautiful. Perhaps a playwright's feel for mystery and darkness is just what this book is missing.

> Nick Gill University of Bristol

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Bright Boys by Tom Green, 2010, A.K. Peters, 320 pp, £33.00, \$39.00, ISBN 978-1-56881-476-6.

This book is about the development of the Whirlwind computer (one of the first largescale electronic digital computers), the SAGE (Semi-Automatic Ground Environment) North American air-defence system, the young socalled 'bright boys' who made them happen, and some of the surrounding Cold War American military history.

The Whirlwind project started life at the Massachusetts Institute of Technology Servomechanisms Laboratory in 1944, in an attempt to build a flight simulator using an analog computer, and was initially funded by the US Navy. The project later switched to building a general-purpose electronic digital computer, with the application to flight simulation seemingly abandoned. Unlike other digital computers of the time, the Whirlwind was designed for real-time computing, and so had to be fast and very reliable. These requirements eventually led to many firsts, including the design and use of random-access magnetic-core memory, and the use of graphic displays and 'light guns' for human-computer interaction. However, Whirlwind was a huge and costly project, which was not fulfilling the original aims of the US Navy, and its future was threatened. Fortunately, Whirlwind was exactly the sort of computer the (relatively new) US Air Force needed in its plans for a complex air-defence system, urgently required after the Soviets tested an A-bomb unexpectedly early, in 1949, and the Whirlwind project was saved. In the end, Whirlwind technology was used in the computers (built by IBM) for the SAGE air-defence system, and the subsequent development of the SAGE system and its technology formed the pre-history of the internet.

All this should be a very interesting story, but I did not warm to the book. First, there is an annoying gung-ho style; for example when the author makes grand claims such as: "If the country had pinned its hopes on the Manhattan Project to end a war, its trust was pinned on the bright boys to help save a world. ... they poked a gaping hole in the future and dragged into being the modern world of Information Technology". Also, there is little technical detail and no real mathematics. In fact, mathematicians "and their penchant for quickly factoring the previously impossible" (whatever that means), who want to use computers for stand-alone calculations, are sometimes cast as enemies of the MIT engineers designing and building their expensive, realtime, command-and-control computer. Perhaps the book I should have read instead is: Project Whirlwind: The History of a Pioneer Computer, by Kent C. Redmond and Thomas M. Smith, Digital Press, Bedford, MA, 1980, for a more technical and satisfying account of Whirlwind. (Redmond and Smith have also written From Whirlwind to MITRE: The R&D Story of the SAGE Air Defense Computer, MIT Press, Cambridge, MA, 2000.)

> Leonard H. Soicher Queen Mary, University of London

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Duel at Dawn by Amir Alexander, 2010, Harvard University Press, 307 pp, US\$29, £21.95, €26.10, ISBN 978-0-674-04661-0.

If the title of this book does not make a mathematician of sense and sensibility wince, its contents will. It has a sort of subtitle 'Heroes, martyrs, and the rise of modern mathematics'. This is not a subtitle in the ordinary sense. It appears on only one of the three title pages; it is not printed on the cover of the book, though it appears on the paper jacket, down in the bottom right corner, well separated from the title. It seems to serve as a substitute for a preface and may help mathematicians and nonmathematicians alike to get some idea what the book is about.

According to the author the book belongs to "the new field of mathematics and culture" (p. 299). What is this new field? Is mathematics not a part of culture? He writes (p. 1):

the central argument of this book is simple and can be stated briefly: the duel that ended the life of young Galois marks the end of an era in the practice of mathematics and the beginning of another. In a word, it marks the birth of modern mathematics.

well-defined concept that it can be said to have been born on 30 May 1832? Of course not. Mathematics evolves. Even its precisely

Is modern mathematics, then, such a

duel at dawn

Tom Green



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formulated theorems are usually the product of a long period of evolution.

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The author compares (p.3) the story of Galois with those of Abel, János Bolyai, Ramanujan, Nash, Gödel, Grothendieck and Perelman:

Among modern mathematicians, it seems, extreme eccentricity, mental illness, and even solitary death are not a matter of random misfortune. They are, rather, almost signs of distinction, reserved only for the most outstanding members of the field.

So were Hilbert, Poincaré, Burnside, Hardy, Littlewood, Emmy Noether, Philip Hall, Hodge, Feit not among the most outstanding members of our field? And what about those who, with sanity intact, are still with us, such as Serre, Atiyah, Hirzebruch, Thompson, Wiles? Depending on the force of the word 'almost' and the scope of the word 'only' the logic of the above passage may have no such implication, but it comes perilously close to doing so. Besides, is not outstanding mathematical ability eo ipso a form of eccentricity? This passage is followed (p. 5) by

Remarkably, the new persona of the tragic mathematical misfit and the new practice of pure and insular mathematics came on the scene at precisely the same time [the early decades of the nineteenth century]. The central argument of this book is that this is no coincidence: the mathematical legend that appeared in the age of Galois is inseparable from the new mathematical practice that transformed the field in those years.

This 'new mathematical practice' near the beginning of the nineteenth century is pure mathematics 'unsullied by the crass realities of the world around us' (p. 4).

The principal characters treated in the book are d'Alembert, Galois, Abel, Cauchy and János Bolyai. Each of these gets a chapter to himself (with the titles

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"The Eternal Child", "A Habit of Insult: The Short and Impertinent Life of Évariste Galois", "The Exquisite Dance of the Blue Nymphs", "A Martyr to Contempt", "The Gifted Swordsman" - if this is culture then what is kitsch?). In between are three other chapters: "Natural Mathematics", on the Enlightenment and the thesis that all eighteenth century mathematics is based on providing a description of how the world works; "The Poetry of Mathematics", which compares mathematicians with other artists but underrates Shelley and overlooks Büchner. Rimbaud, Verlaine, for example, and fills a much-needed gap in the literature; "Purity and Rigor: The Birth of Modern Mathematics", in which 'Cauchy Reinvents the Calculus' and Galois solves 'The Mystery of the Quintic Equation'. Preceding the eight chapters is an introduction summarising their contents, and following them is a conclusion entitled "Portrait of a Mathematician" in which portraits of various people, some mathematicians, some not, are discussed and related to the theses propounded in the main body of the work. Presenting the gentle sketch of Galois aged 15 that was first published by Paul Dupuy in 1896 the author focuses on

the eyes (p. 256): Dark and piercing, they burn with a fire that testifies to fierce passions within and reaches out to distant and profound truths. They look upon us with an ironic skepticism that belies their owner's tender years, and they convey clearly that he is not truly interested in us, who stand before him. What he sees lies far beyond our horizons.

Really? That is not what I see there. And why does the author not compare with the other extant picture, a sketch made from memory by Alfred Galois in 1848, sixteen years after his elder brother's death? To me that one shows a shifty-eyed, untrustworthy scamp. Oh dear!

The narrative of this book is based upon a small amount of mathematics and a

considerable amount of history of mathematics. Neither is reliable. On pp. 202-206, for example, there is a horribly garbled account of Galois' main contributions to the theory of equations. It is neither mathematically nor historically correct. As far as history goes, the thesis that Abel, Cauchy and Galois were men who introduced a kind of mathematics that was 'not derived from the physical world but was, rather, a world unto itself' (p.4) ignores the efforts of the many mathematicians of the two preceding centuries (and, indeed, of earlier times) who had developed much thoroughly 'pure' mathematics in, for example, the theory of equations and the theory of numbers. It also ignores the fact that Cauchy, for example, contributed at least as much to our understanding of differential equations, mathematical physics and mechanics as he did to 'pure' mathematics and its ways of thinking. Furthermore, insofar as Cauchy is credited with the construction of "a new kind of mathematics, strictly circumscribed, but pure and rigorous on its own terms" (p. 185), it belittles (pp. 187-191) the achievements of Cauchy's predecessors and over-rates his own. He was a great mathematician, but he was just one contributor to a long-lasting effort to pin down what a function is, what continuity and differentiability are, what a real proof in Analysis is, that began in the early eighteenth century and progressed far beyond Cauchy's own quite primitive ideas of rigour later in the nineteenth century.

To some extent the author distances himself from the mathematics and its history by examining the development of myths about his romantic heroes alongside his treatment of their lives and mathematical contributions. But it does not work. In my opinion there is little of any value in the book. I cannot recommend it.

Peter M Neumann The Queen's College, Oxford

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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). Please send updates and corrections to

calendar@lms.ac.uk.

OCTOBER 2010

11-15 The Higher-Genus Sigma Function and Applications, ICMS Workshop, Edinburgh (394)

18 Patterns, Nonlinear Dynamics and Applications Meeting, Leeds (395)

NOVEMBER 2010

13-14 MathsJam, Yarnfield Park Training Centre, Staffordshire (396)
16 BCS-FACS Evening Seminar, London (396)
19 LMS Annual General Meeting, Naylor Lecture, London (396)

DECEMBER 2010

6-10 Birational Geometry, ICMS Workshop, Edinburgh (396)
6-10 Uncertainty in Climate Modelling, INI, Cambridge (395)
6-10 Australian Statistical Conference 2010, Fremantle, Australia (383)
13-17 PDE Models for Quantum Fluids, INI, Cambridge (395)
18-20 New Trends in Spectral Theory and Applications Workshop, Cardiff (395)

JANUARY 2011

5-14 School on Moduli Spaces, INI, Cambridge (395) 10-13 UK–Japan Winter School, King's College London (396) 10-14 Embeddings, INI, Cambridge (395)10-14 Torsors: Theory and Application, ICMS Workshop, Edinburgh (394)

FEBRUARY 2011

25 LMS Mary Cartwright Lecture, Oxford

APRIL 2011

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4-8 Computational Challenges in Partial Differential Equations Meeting, Swansea (392)
25-29 The Kervaire Invariant and Stable

Homotopy Theory, ICMS Workshop, Edinburgh (394)

JUNE 2011

6-8 Nonlinear Diffusion: Algorithms, Analysis and Applications Workshop, Warwick (395)
6-10 Oscillatory Integrals in Harmonic Analysis, ICMS Workshop, Edinburgh (394)
26-30 Signal Processing with Adaptive Sparse Structured Representations ICMS Workshop, Edinburgh (394)
26-30 New Developments in Non-Commutative Algebra and Applications ICMS Workshop, Skye (394)

JULY 2011

1 LMS Meeting, London

4-8 Set Theory ICMS–ESF Meeting, Edinburgh (394)

 18-22 ICIAM 2011, Vancouver, Canada (388)
 19 LMS Northern Regional Meeting, Leeds
 19-22 Homogeneous Structures Workshop, Leeds

SEPTEMBER 2011

5-9 European Women in Mathematics General Meeting, Barcelona (396)
10-16 Turning Dreams into Reality ICME, South Africa (388) 23

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E.H. RHODES LMS member 1875–1894



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Edward Hawksley Rhodes, BA Deputy Keeper in Her Majesty's Office of Land Revenue Records

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