THE LONDON MATHEMATICAL SOCIETY

NEWSLETTER No. 350 July 2006

Forthcoming Society Meetings

2006

Monday 3 July
Northern Regional Meeting, Leeds
U. Haagerup
N. Kalton

Friday 25 August
ICM, Madrid
R. Bryant
G. Toussaint
(LMS-RSME Special Lectures)
[*page 23*]

Monday 11 September
South West and South Wales Regional Meeting, Bath
P-L. Lions
T. Seppalainen
[*page 3*]

Friday 17 November
AGM, London
Geometric Analysis
R. Hamilton
P. Topping

COUNCIL DIARY

16 June 2006

I and the three other Council members from Scotland who travelled to London for the June meeting were struck by two things unfamiliar north of the border: a temperature in the high twenties and a sea of red and white flags and emblems decorating shops, buildings and passers-by!

Financial matters were high on the agenda. The Treasurer presented his budget proposals in a new format, with firm figures for 2006-07 accompanied by planning estimates for the two following years. With income expected to increase from letting conference facilities in De Morgan House and from journal sales, the financial state of the Society appears sound in the medium term. Council approved a 10% increase in the annual subscription, but this should be viewed in the light of the many and varied activities that the Society now undertakes for the mathematical community, such as research support, meetings, publications and representation. Council also approved a restructuring of prices for Society journals, so that from 2007 subscriptions for the online version of each journal will include access to the complete archive. Council considered various aspects of the Society's investments, with a paper on ethical investments provoking a particularly lively discussion.

Council received a report of a preparatory meeting of the Joint Planning Group charged to prepare detailed plans for a route to possible unification of the Society with the Institute of Mathematics and its Applications (IMA). The target is to bring preliminary conclusions on core issues such as the constitution and membership of the new body to the two councils by November 2006.

The Department for Education and Skills consultation *Reform of Higher Education Research Assessment and Funding*, published two days earlier, aroused considerable concern. (See www.dfes.gov.uk/consultations/conDetails.cfm?consultationId=1404 and www.hefce.ac.uk/research/assessment/reform/.)

This document proposes replacing the RAE by a metric-based assessment depending mainly on research grant income. The models suggested appear to be wholly inap-

propriate for mathematics where the main resource is people rather than expensive equipment, and HEFCE's calculations based on the models show the devastating effect on the funding of both pure and applied mathematics that would result. The Society will make a robust reply to this consultation and others are urged to do so through their own institutions.

Council approved the response of the Council for Mathematical Sciences (which comprises the LMS, IMA and Royal Statistical Society) to another consultation document 'Science and Innovation Investment Framework 2004-2014: Next Steps', from the Office of Science and Technology. The response notes that mathematics plays a pivotal role in all five key areas considered in the document and urges strong measures to ensure a broadly based, scientifically educated workforce as the foundation for a knowledge economy. Such measures include a reduction in tuition fees for strategic shortage subjects, increased funding for PhD studentships and mid-career fellowships, incentives to encourage and facilitate exploitation of scientific ideas, and the funding of ambitious landmark projects in mathematics and statistics.

The response also anticipates the problems of research assessment metrics mentioned above.

Council confirmed the Society's arrangements for the International Congress of Mathematicians in Madrid in August. The Society will have a stand throughout the Congress and, jointly with Real Sociedad Matemática Española, will host a meeting of special wide-interest lectures (see page 23). The Programme Committee has awarded grants to support about eight mathematicians attending the Congress.

Council finished its deliberations just in time for the Hardy Lecture meeting, which also included a talk on the Life and Legacy of Augustus De Morgan, appropriately just a few days before the 200th anniversary of our first President's birth.

Kenneth Falconer

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LONDON MATHEMATICAL SOCIETY

SOUTH WEST & SOUTH WALES REGIONAL MEETING

Department of Mathematical Sciences University of Bath

Monday 11 September 2006

3.15pm **LMS business meeting**

3.30pm **Timo Seppäläinen (Madison)**
Limit shapes and fluctuations for some planar stochastic growth models

4.30pm **Tea**

5.00pm **Pierre-Louis Lions (Paris)**
Stochastic lattices and deformation energies

There will be a dinner afterwards. For registration, further details and to reserve a place at the dinner, see the webpage www.bath.ac.uk/math-sci/lms-bath or contact Mrs G. Lowe at gml@maths.bath.ac.uk.

The meeting will be followed by a workshop from 11 – 15 September on *Analysis and Stochastics of Growth Processes*. The aim of this workshop is to bring together analysts and probabilists working on the mathematical description of growth phenomena. Models based on the physics of individual particles will be discussed alongside models based on the continuum description of large collections of particles.

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 can be expressed on the on-line registration form. For further information see www.bath.ac.uk/math-sci/lms-bath or contact the organizers (P. Mörters, R. Moser, M. Penrose, H. Schwetlick, J. Zimmer) at lms06@maths.bath.ac.uk.

LMS MEETING & RECEPTION AT THE ICM 2006

The London Mathematical Society will be holding a Meeting and Reception on Friday 25 August, during the ICM 2006 in Madrid.

The Meeting (see page 23) is part of the Special Lectures series and is jointly held with the Real Sociedad Matemática Española, from 18:00 – 20:00. The speakers are Robert Bryant (Duke University) and Godfried Tousssaint (McGill University). An ordinary meeting of the LMS will be held just before these lectures, during which members will be able to sign the membership book.

The meeting will then be followed by an LMS reception, for its members and guests, from 20:00 – 21:00. Members who wish to attend the reception should apply for their free ticket from the Society's Administrator Susan Oakes (oakes@lms.ac.uk) no later than **28 July**. The Society hopes to entertain as many as possible of its members who are attending the Congress, but numbers are limited by the capacity of the room.

LMS PRIZES 2006

Pólya Prize

PROFESSOR SIR HENRY PETER FRANCIS SWINNERTON-DYER, Bt, KBE, FRS, of the University of Cambridge, is awarded the Pólya Prize.

Peter Swinnerton-Dyer has been a world leader in Diophantine number theory for half a century, and his name is associated with some of the deepest unsolved problems in mathematics. He was also a pioneer in practical computer science; computer experimentation played an important part in work on elliptic curves and the Birch–Swinnerton-Dyer conjectures, and served as a precursor of modern computational number theory. His lifelong study of rational points on surfaces has led to a worldwide school of Diophantine geometry, and he continues to lead this field with fascinating and unexpected new discoveries.

Senior Berwick Prize

PROFESSOR MILES REID FRS, of the University of Warwick, is awarded the Senior Berwick Prize for his paper with Alessio Corti and Alexander Puklihkov, *Fano 3-fold hypersurfaces*, published in *Explicit birational geometry of 3-folds* (LMS Lecture Note Series No.218). The paper made a big advance in the study of 3-dimensional algebraic varieties. The first deep result on the birational geometry of 3-folds was the 1971 theorem by Iskovskikh and Manin that a smooth quartic 3-fold is not rational. The Corti-Pukhlikov-Reid paper vastly generalizes this result, by showing that all 95 of the Fano hypersurfaces in weighted projective spaces are not rational. In fact, much more is proved: these varieties are 'birationally rigid' and in that sense are far from rational. The paper combines the methods of Mori theory with the Russian school of birational geometry, and has formed a foundation for a lot of later work.

Fröhlich Prize

PROFESSOR MICHAEL WEISS, of the University of Aberdeen, is awarded the Fröhlich Prize for his use of algebraic topological methods to solve a number of different geometric problems.

His early papers with Andrew Ranicki and Bruce Williams analysed algebraic and homotopy theoretic properties that characterise manifolds amongst topological spaces. He has made important advances in adapting the Goodwillie calculus of homotopy functors to give a new approach to understanding the nature of spaces of embeddings of one manifold in another. In this work he has managed to obtain very specific geometric information by using somewhat elaborate and abstract machinery.

Weiss is most famous for his work with Madsen in resolving a conjecture due to Madsen and Tillmann. They succeed in completely determining the homology type of the moduli spaces of Riemann surfaces as the genus tends to infinity. As a special case they solve Mumford's much studied conjecture about the rational cohomology of this space. It was a surprise that the sophisticated methods of modern homotopy theory together with some well known geometric input would yield these results.

Whitehead Prizes

PROFESSOR RAPHAËL ROUQUIER, of the University of Leeds, is awarded a Whitehead Prize for his many incisive contributions to representation theory. The breadth and depth of Rouquier's work is spectacular. Among some of the topics to which he has made important contributions are: braid groups, Broué's abelian defect conjecture, stable equivalences of categories of representations, perverse Morita equivalences, representations of Hecke algebras, complex reflection groups, basic sets of Brauer characters, Lusztig families, derived equivalences of blocks of symmetric groups, Cherednik algebras, Deligne-Lusztig varieties, pseudocharacters, and triangulated categories. One of Rouquier's best known contributions is his recent work with J. Chuang, University of Bristol, showing that the derived category of a block of modular representations of a symmetric group is determined by a single numerical invariant, namely its weight. This result is now a landmark in modular representation theory. The solution of the problem is not only a technical tour-de-force but also uses several techniques previously unfamiliar to workers in the area and points the way forward in a number of directions.

PROFESSOR JONATHAN SHERRATT, of Heriot-Watt University, is awarded a Whitehead Prize for his contribution to mathematical biology and, in particular, the development and analysis of new mathematical models for complex biological processes. He has worked on a broad range of topics. Notable among these are wound healing, pattern formation, tumour growth and spatiotemporal chaos. His work is truly multidisciplinary and often collaborative, and is characterised by originality and novelty. He has published widely in mathematical biology journals and the biological literature. His papers are motivated by biological and medical problems, apply modeling and analysis to understand these, and then provide a significant link back to the biology.

DR AGATA SMOKTUNOWICZ, of the University of Edinburgh, is awarded a Whitehead Prize for her contributions to noncommutative algebra. In the past six years, Smoktunowicz has solved a number of outstanding problems. She has made the first significant progress for several decades on some fundamental problems concerning nil rings. The most spectacular of these results is the construction, over any countable field, of a simple nil algebra. In a different direction, Smoktunowicz has recently verified the Artin-Stafford Gap Conjecture which is concerned with the possible values of the Gelfand-Kirillov dimension of graded domains; such domains are the setting for the developing theory of noncommutative projective algebraic geometry. In all of her work, Smoktunowicz has introduced novel techniques and constructions and she displays a great ability to deal with long, difficult and technically demanding calculations.

PROFESSOR PAUL SUTCLIFFE, of the University of Kent, is awarded a Whitehead Prize for his many significant contributions to the study of topological solitons and their dynamics. Using a powerful synthesis of analysis, geometry and physical insight, combined with high-intensity computing, he has produced definitive and influential results for a wide range of soliton systems, and has discovered unexpected relations between several of them. In particular, he and his collaborators showed that Skyrme solitons have a polyhedral structure, related to those of carbon fullerenes; and discovered the first stable knotted soliton solution in classical field theory. His recent monograph with Manton is a comprehensive survey of the whole field.

CECIL KING TRAVEL SCHOLARSHIP AWARD

The 2006 Cecil King Travel Scholarship has been awarded to Malcolm Bovey, a PhD student at King's College London. The London Mathematical Society makes the award of up £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. Malcolm will use the Scholarship to fund a trip to the University of California, San Diego, during the 2006-07 academic year. During his visit he hopes to investigate a new Congruence conjecture, which gives a new *p*-adic approach to understanding the properties of Stark units through the use of local Hilbert symbols.

FELLOWS OF THE ROYAL SOCIETY

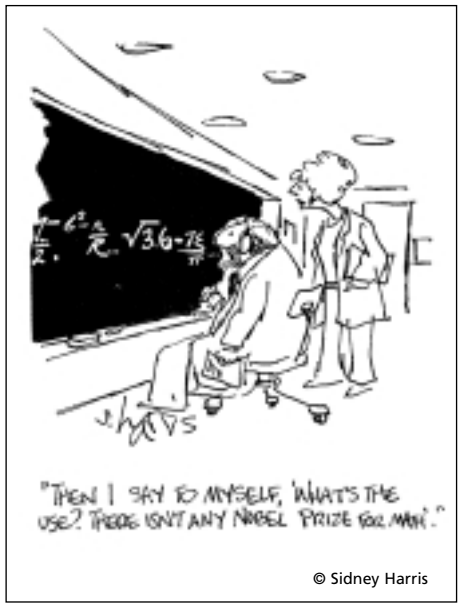
Amongst those elected to Fellowship of the Royal Society in May 2006 were

- Peter James Donnelly, Professor of Statistical Science, University of Oxford
- Raymond William Ogden, George Sinclair Professor of Mathematics, University of Glasgow
- Jerrold Eldon Marsden, Carl F. Braun Professor of Engineering and Control and Dynamical Systems, Caltech
- Michael Richard Edward Proctor, Professor of Astrophysical Fluid Dynamics, Department of Applied Mathematics and Theoretical Physics, University of Cambridge
- Nicholas Ian Shepherd-Barron, Professor of Algebraic Geometry, University of Cambridge
- Peter Christopher West, Professor in Department of Mathematics, King's College London

Kenneth Joseph Arrow, Joan Kennedy Professor of Econonics Emeritus & Professor of Operations Research Emeritus, Stanford University, was elected a Foreign Member.

LMS HANDBOOK AND LIST OF MEMBERS 2006

The Society is preparing a new Handbook and List of Members which will appear in September 2006. An email showing the information for your entry in the List of Members has been sent to every member (those who do not have email have been sent a letter) asking you to check and correct the data, and return it to us. If you have not received the email or letter please contact the LMS office (tel: 020 7637 3686, fax: 020 7323 3655, email: handbook@lms.ac.uk).



PAUL M. COHN

Paul Moritz Cohn FRS died on the 20 April 2006, aged 82. Since he became a member of the London Mathematical Society in 1957, he has served the Society in many ways; he was Secretary 1965-67, he was a Member of Council 1968-75 and again in 1979-84, and he was President in 1982-84. He was Editor of the LMS Monographs 1968-77 and 1980-93.

He was born in Hamburg on 8 January 1924, the only child of Julia and James Cohn. He was sent to England on the *Kindertransport* in the spring of 1939, and never saw his parents again. After a period working on a chicken farm and then in a factory, he went to Trinity College, Cambridge in 1944 to study mathematics. Despite being prevented from attending for some of his first year, he was able to take his first year exams and do so well that there was no further obstruction to his studies and he obtained his BA in 1948 and his PhD working with Philip Hall in 1951. After a year at the university of Nancy, he returned to a lectureship in Manchester where he remained for 10 years. He came to London in 1962 as a Reader at Queen Mary College and subsequently became Professor of Mathematics at Bedford College, University of London, in 1967. He was awarded the Senior Berwick Prize in 1974. He became a Fellow of the Royal Society in 1980. When the colleges of London were reorganised in 1984, he moved to a Professorship at University College, London, and became the Astor Professor of Mathematics there in 1986 until his retirement in 1989. Since then he has been an Honorary Research Fellow at UCL where he has continued to write papers and books until his death.

Paul Cohn was an algebraist. His early work was in many areas within algebra including groups, Lie algebras and rings. However, in the '60s he began the work that was to be his main interest; the study of rings, in particular his beautiful theories of the free associative algebra and of skew fields. His ground-breaking and lonely work in this area involved the development of techniques that have been of increasing importance throughout algebra and to a lesser extent in algebraic geometry and topology. He has published many books at both research and undergraduate level; important works include *Free Rings and their Relations, Skew Field Constructions* and the three volume work *Algebra*.

He leaves behind his wife Deirdre whom he married in 1958, his two daughters Juliet and Yael, and five grandchildren.

Aidan Schofield writes: I met Paul Cohn in 1980 when I became his graduate student at Bedford College in Regent's Park. His books had been an inspiration and a delight for me and he himself fulfilled all I had been led to expect from them. We talked constantly about mathematics in a way that endangered our lives as we walked from Bedford College to seminars at Kings College; it was impossible to pay necessary attention to traffic with such interesting ideas flying between us. I miss those days and now I shall miss him.

DOROTHY S. MEYLER

Miss Dorothy Skeel Meyler, who was the longest-standing member of the LMS, elected a member on 13 December 1934, died on 16 June 2006 at the age of 97. Born in Milford Haven, Pembrokeshire on 30 September 1908, she entered the University College of Wales, Aberystwyth (as it was then) as a College Scholar on 1 October 1925, aged 17. She graduated with First Class Honours In Pure Mathematics in 1928 followed by a First Class Honours in Applied Mathematics in 1929.

She then proceeded to work for an MSc under the supervision of Professor V.C. Morton on a subject in classical projective geometry. But alas, her plans went awry when in February 1931 she was diagnosed to be suffering from the dreaded disease of that time, tuberculosis. She was in hospital for more than a year. However, partly through characteristic determination, she recovered and was able to submit her MSc in January 1933. In October 1933 she went up to Newnham College, Cambridge to study for a PhD under the supervision of W.V.D. Hodge, one of the first (if not the first) of his research students.

Her studies were going well, but after only one year a vacancy occurred in her old department and she was invited to apply for an Assistant Lectureship. With the job position as it was then, Hodge advised her that she really had no choice but apply. Hodge tried unsuccessfully to find ways for her to complete the residential requirements for a PhD, but unfortunately her new department were not supportive in that respect. She then became one of a few female lecturers in Mathematics in the UK.

Although she did have three publications to her name, two of them in the Society's *Proceedings* and *Journal*, her research did not really ever take off. Her position was further exacerbated by the advent of the World War in 1939, as she had to take over the teaching of a member of the applied mathematics staff who had been called up for military service – she claimed that at one time she was lecturing for 22 hours per week. However, she earned herself a tremendous reputation as a teacher. She set high standards for herself and was equally demanding of her students. These students truly respected her, were uniform in their praise of her ability as a teacher and her influence on their thinking. She was promoted to Senior Lecturer in 1957 around the time of the appearance of the still useful book, *A Compendium of Mathematics and Physics* which she co-authored with Sir Graham Sutton, Director-General of the Meteorological Office. She was Acting Head of Pure Mathematics on two occasions. She retired on 30 September 1975 on her 67th birthday after a 50 year connection with the College, interrupted only by a year of illness, a year in Cambridge and a year in Harvard late in her career.

On her retirement she hoped to find time to do many things that she had not had time for earlier, like buying a television. But that was not to be; poor eyesight developed over the years to become total blindness later. But she faced life with the same fortitude and determination right to the end.

A.O. Morris

ANTHONY F. RUSTON

Dr Anthony Ruston, who was elected a member of the London Mathematical Society on 19 December 1946, died on 28 June 2005, aged 84. He served as Secretary to the Society from 1950-53 and as a Vice President from 1954-55.

His first and postgraduate degrees were at Cambridge, and he held a position at King's College London from 1949 before being appointed Senior Lecturer at Sheffield University in 1953. He moved to the University of Wales, Bangor in 1963 as a Senior Lecturer in Mathematics. He was promoted to Reader in 1968, and retired in 1977.

He has 18 publications reviewed on MathSciNet, in the areas of normed spaces, Banach spaces, and Fredholm Theory. His last publication was *Fredholm Theory in Banach Spaces*, Cambridge Tracts in Mathematics, No. 86 (1986), covering the previous 25 years' research work, and still available.

AUSTRIAN ACADEMY OF SCIENCES

Emeritus Professor Peter McMullen (University College London) has been elected a foreign member of the Austrian Academy of Sciences. He was presented with his certificate of election by the President of Austria at a ceremony in Vienna on Wednesday 17 May 2006.

ALGORITHMIC ASPECTS OF SEMIGROUP THEORY

An international workshop on *Computational and Algorithmic Aspects of Semigroup Theory* will take place from 5-9 September at St Andrews University. The aim of this workshop is to bring together those working in computational and algorithmic aspects of semigroup theory. Specific topics include, but are not limited to: transformation semigroups, presentations, rewriting systems, decision problems, automatic structures, the GAP system, and complexity. The Plenary Speakers are: Fred Otto (Universitat Kassel, Germany) (to be confirmed), Goetz Pfeiffer (NUI, Galway, Ireland), Jean-Eric Pin (LIAFA, CNRS, and Paris VII, France) and Misha Volkov (Ekatrinburg, Russia).

Registration is available online at www.gap-system.org/semigroups2006. The workshop was awarded an LMS conference grant.

SPITALFIELDS DAYS

In 1987 the London Mathematical Society instituted a series of occasional meetings called Spitalfields Days. The name honours our predecessor, the Spitalfields Mathematical Society, which flourished from 1717 to 1845.

A Spitalfields Day is usually associated with a long-term symposium on some specialist topic at a UK university. One of the symposium organizers is asked to arrange a one-day meeting at which selected participants, often distinguished experts from overseas, will give survey lectures on topics in the field of the symposium or other types of lecture accessible to a general mathematical audience. These meetings are publicized in the *Newsletter* and all members are invited to attend.

The standard grant for a Spitalfields Day is £500, and is intended to meet actual supplementary costs associated with the event (for example, cost of a subsidy for a lunch for participants and administrative costs). We would also encourage grant holders to make some of it available in the form of small (£50) travel grants to enable LMS members and research students to attend the event.

Anyone involved in running a symposium who would be interested in organizing a Spitalfields Day is invited to write to Dr S.A. Huggett, Programme Secretary at the Society (grants@lms.ac.uk). The format need not be precisely as described, but should be in a similar spirit.

INVITED LECTURES SERIES

Programme Committee has decided to plan further ahead for the Invited Lectures series, and will therefore be considering proposals for the 2008 Invited Lectures at its meeting in October 2006. For the 2008 meeting, proposals are now invited from any member who, in addition to suggesting a topic and lecturer, would be prepared to organize the meeting at the member's own institution or a suitable conference centre. A grant is given to the host department to support attendance at the lectures.

The Society's Invited Lectures series consists of meetings at which a single speaker gives a course of about ten expository lectures, examining some subject in depth, over a five day period (Monday to Friday) during a University vacation. The meetings are residential and open to all interested. It is intended that the texts of the lectures given in the series shall be published. In addition to full expenses, the lecturer is offered a fee of £1,250 for giving the course and a further fee of £1,500 on delivery of the text in a form suitable for publication.

Previous lecturers:

D. Zagier (1998)	P. van Moerbeke (2002)
A. Mielke (1999)	M. Fukushima (2003)
B. Dubrovin (2000)	M.W. Davis (2004)
T. Goodwillie (2001)	M.F. Singer (2006)

Enquiries about this series should be directed to the Programme Secretary at the Society (grants@lms.ac.uk). The deadline for the submission of a proposal is **Wednesday 20 September**. Programme Committee hopes to make a decision on 12 October.

LMS INVITED LECTURE SERIES

Professor M.F. Singer (North Carolina State University)

Introduction to the Galois Theory of Differential and Difference Equations

31 July – 4 August 2006

The 2006 LMS Invited Lectures will be given at Heriot-Watt University. The series is held annually: a single speaker gives a course of 10 expository lectures, examining an important topic in depth over a five day period. In the 2006 programme there will be two lectures by Professor Singer each morning, who will cover the following topics

- Fundamental results (Picard-Vessiot extension, the Galois correspondence)
- Analytic results (connections with monodromy and the Stokes phenomenon)
- Algorithmic results (Kovacic algorithm, its generalizations and the algorithm of Hrushovski)
- Difference equations (the Galois theory of difference equations, comparing and contrasting to previously presented results)
- Parameterized differential equations, linear differential algebraic groups and isomonodromy

The lecture course by Professor Singer will be supported by afternoon short courses on *Model Theoretical Aspects of Differential Galois Theory*, *D-modules*, *Differential Algebra*, *Integrable Systems*, *Symbolic Computations* as well as tutorials and discussions. Lectures are aimed at graduate students, post-docs and researchers from complementary areas.

All mathematicians interested in the topic are welcome to attend the lectures, although the total number of participants may be limited. There is a registration fee of £30 payable on arrival. The registration fee will be waived for research students. Limited funds are available to support participants. Priority will be given to research students and mathematicians based in the UK who would benefit from attending the lectures, but who would otherwise be prevented from attending by financial constraints.

Accommodation will be at Heriot-Watt University. For further details, or to express interest in taking part in the Invited Lecture Series, contact either Alexander Mikhailov (sashamik@maths.leeds.ac.uk) or Chris Eilbeck (J.C.Eilbeck@hw.ac.uk).

The ICMS International Workshop *Algebraic Theory of Differential Equations* will take place at Heriot-Watt University during the following week (6-12 August).

This full two-week mini-programme is planned to be multidisciplinary in nature, embracing Differential Algebra and Differential Galois Theory, Model Theory, the Theory of Integrable Equations and Computer Algebra applications.

LMS PROGRAMME AND CONFERENCE FUND

Members are reminded that the Society's Programme and Conference Fund is used to provide conference grants (Scheme 1), grants to visitors to the UK (Scheme 2), grants to support joint research groups (Scheme 3), collaborative small grants (Scheme 4) and international short visits (Scheme 5).

For full details of all the Schemes please see the Society's website (www.lms.ac.uk/grants/index.html). Queries regarding applications can be addressed to the Programme Secretary, Stephen Huggett (tel: 01752 232710, e-mail: s.huggett@plymouth.ac.uk) or the Secretary to Programme Committee, Sylvia Daly (tel: 020 7291 9971, email: daly@lms.ac.uk, Wednesday-Friday) who will be pleased to discuss proposals informally with potential applicants and give advice on the submission of an application.

Please note that grant applications will not be considered between July and September. The next deadline for receipt of applications is **20 September 2006** and these will be considered at a meeting on 12 October 2006. We are currently reviewing our deadlines so please check the website for details which will be announced later this year.

Grants awarded between November 2005 and May 2006

Scheme 1

Applicant	Title	Grant
A. Scott	One-Day Meeting in Combinatorics	£1,790
G. Jones (organiser C. Long)	8th Annual Postgraduate Group Theory Conference	£2,641
A.J.W. Hilton	Reading 2-day Combinatorics Colloquium (to celebrate 50 years of Combinatorics at Reading)	£2,500
M. Mathieu I. Todorov	Operator Algebra Workshop 2006	£1,410
Z. Qian	Workshop on Stochastic Analysis and Applications	£3,000
K.A. Brown	Ring Theory: Recent Progress and Applications	£2,950
J. Mitchell	Scottish Algebra Day	£1,130
M. Mathieu	Belfast Functional Analysis Day 2006	£795
A. Ranicki	Surgery Theory Past, Present and Future (A celebration of C.T.C. Wall's 70th birthday)	£4,000
A. Duncan	Postgraduate satellite conference to the 58th BMC, Newcastle 2006	£1,000
J-L. Hudry	Truth and Proof: Kurt Gödel and the Foundations of Mathematics	£600
A.M. Stuart	Mathematical Aspects of Data Assimilation	£2,000
A.J. Wilkie	British Logic Colloquium 2006	£3,670
S. Perkins (organiser M. Higgs)	17th Postgraduate Combinatorial Conference	£1,720

Scheme 1 (cont'd)

Applicant	Title	Grant
R. Porter	Applications of Linear Wave Theory (a meeting to mark the occasion of the retirement of Professor David Evans)	£1,500
V.P. Belavkin	Quantum Probability and Applications	£3,000
M.D. Crossley	21st British Topology Meeting	£2,590
T.J. Bridges R.M. Roberts	Geometry and Mechanics	£1,100
J. Zimmer	56th European Study Group with Industry	£1,000
P.J. Rippon	One Day Function Theory Meeting	£1,000
M. Bate	Algebraic Groups and their Representations	£2,290
R.W. Knight	The Oxford Conference on Topology and Computer Science in honour of Peter Collins and Mike Reed	£2,000
R. Schmidt	Joint 9th International Conference on Relational Methods in Computer Science and 4th International Workshop on Applications of Kleene Algebra	£2,000
P.J. Cameron	Groups and Computation 2006: a Leedham-Green Fest	£800
A. Taormina	Tenth Annual UK Meeting on Integrable Models, Conformal Field Theory and Related Topics	£2,260
D. Crisan	Workshop on Particle Approximations in Filtering and Applications	£4,000
S.Y. Novak	2nd International Workshop on Recent Advances in Probability and Statistics	£2,900
J. Mitchell	Computational and Algorithmic Aspects of Semigroup Theory	£800

Scheme 2

Applicant	Visitor	To Visit	Grant
L. Parnovski	R. Shterenberg	UCL, Heriot-Watt, Birmingham	£1,200
D.F. Holt	S. Hermiller	Leicester, Newcastle, Warwick	£1,200
S. Kuksin	I. Chuyeshov	Heriot-Watt, Edinburgh, Newcastle	£1,050
B. Pelloni	J.M. Melenk	Reading, Oxford, Imperial College	£850
B. Zegarlinski	T. Komorowski	Swansea, Oxford, Warwick, London, York	£320
S.B. Cooper	A.L. Selman	Edinburgh, Leeds, Oxford, Durham	£880
M. Dritschel	V. Vinnikov	Newcastle, Leeds, Lancaster	£1,000

cont'd

Scheme 2 (cont'd)

Applicant	Visitor	To Visit	Grant
D. Crisan	J. Xiong	Manchester, Imperial College, Bath	£1,100
S.S. Wainer	G. Jäger	Leeds, St Andrews, Manchester	£900
P.K. Maini	A.S.R. Srinivasa Rao	Oxford, Imperial College, Bath	£1,200
H. Logemann	R.L. Rebarber	Imperial College, Exeter, Bath	£1,000
I. Smolyarenko	V. Yudson	Brunel, Birmingham, Nottingham	£1,040
J-L. Wu	F-Y. Wang	Manchester, Swansea, Oxford, Loughborough, Warwick	£1,200
M. Farber	R. Geoghegan	Durham, Edinburgh, Newcastle	£1,100
E.V. Ferapontov	M. Pavlov	Imperial College, Loughborough, Glasgow	£1,100
N.J. Laustsen	T. Schlumprecht	Cambridge, University College London, Lancaster	£1,200
M. Haase	B. Haak	Oxford, Leeds, Glasgow	£1,000
S. Rees	B. Baumeister	Edinburgh, Newcastle, Manchester	£1,070
S. Rees	G. Havas	St Andrews, Newcastle, Warwick	£1,050
D. Strauss	A. Lau	Leeds, Lancaster, London	£1,200
M. Ruzhansky	P. D'Ancona	Imperial College, Edinburgh, Bristol	£1,200
M. Pollicott	Y. Pesin	Imperial College, Manchester, Warwick	£1,000
S.Y. Novak	I.S. Borisov	Oxford, Middlesex, Cambridge	£700

Scheme 3

Applicant	Institution	Title	Grant
G.K. Sankaran	Bath	Algebraic Geometry Seminar (COW)	£1,200
J.S.W. Lamb	Imperial College	London Dynamical Systems Group	£1,200
A. Sevastyanov	Aberdeen	ARTIN (Algebra and Representation Theory In The North)	£1,200
H.R. Dullin	Loughborough	East Midlands Mathematical Physics Seminar	£1,200
T. Brzezinski	Swansea	Quantum Geometry of Hopf Algebras and Hopf Algebroids	£900
J. Figueroa-O'Farrill	Edinburgh	North British Mathematical Physics Seminar	£900

Scheme 4

Applicant	Institution	Collaborator	Institution	Grant
P. Flavell	Birmingham	H. Bender	Christian Albrechts, Kiel	£500
D. Kahrobaei	St Andrews	G. Arzhantseva	Geneva	£390
M. van den Berg	Bristol	P.B. Gilkey	Oregon	£500
M. Mathieu	QUB	Y-F. Lin	National Hualien, Taiwan	£500
T. Ward	UEA	C. Rottger	Iowa State University	£500
A. Borovik	Manchester	N. Mnev	V.A. Steklov Institute, St Petersburg	£500
S.Y. Novak	Middlesex	I.S. Borisov	Mathematics Institute, Novosibirsk, Russia	£500
M. Rees	Liverpool	J. Kiwi	Pontificia Universidad Catolica, Santiago	£500
G.M.H. van der Heijden	UCL	K. Yagasaki	Gifu, Japan	£500
M. Langer	Strathclyde	C. Tretter	Bremen	£500
D. Strauss	Hull	H.G. Dales, A. Lau	Leeds, Alberta, Canada	£500
J.R. Partington	Leeds	E. Gallardo-Gutiérrez	Zaragoza, Spain	£500
J.C. Wood	Leeds	R. Wolak, A. Trautman & P. Nurowski, P. Walczak	Krakow, Warsaw, Lodz	£500
K. Cherednichenko	Cambridge	V.M. Babich, V.V. Zhikov	Steklov Institute, St Petersburg, Moscow State University	£460
N. Heuer	Brunel	E. Bespalov	Russian Academy of Sciences	£500
M. Haase	Leeds	M. Crouzeix	Rennes, France	£500
E.V. Ferapontov	Loughborough	C. Klein	Max Planck Institute, Germany	£250
W.J. Zakrzewski	Durham	V. Hussin	Montreal	£500
M. Bartuccelli	Surrey	A. Illyin	Keldysh Institute, Moscow	£500
A. Hill	Bath	J.C. Butcher	Auckland	£500
I.A. Korchagina	Birmingham	R. Lyons	Rutgers	£500

cont'd

Scheme 4 (cont'd)

Applicant	Institution	Collaborator	Institution	Grant
J.H.B Deane	Surrey	G. Gentile	Roma Tre, Rome	£480
F. Mezzadri	Bristol	A. Its, Mo Man Yue	Indiana, USA, Centre de Recherches Mathématiques, Montreal	£500
F. Tari	Durham	M.A.S. Ruas	São Paulo, Sao Carlos	£500

Scheme 5

Applicant	Visitor/Institution	To Visit	Grant
R. Hirsch	T.S. Ahmed (Cairo)	Cairo	£300
V.I. Burenkov	M. S. Sokolov (Uzbekistan National University)	Cardiff	£1,700
A.S. Wassermann	R. El Harti (Hassan I, Settat, Morocco)	Glasgow	£1,670

EPSRC MATHEMATICAL SCIENCES PROGRAMME

Opportunities for UK academics at the IHÉS

EPSRC has been supporting IHÉS for a number of years and wishes to foster closer links between British Institutions and French research centres of excellence.

Visits to IHES – We encourage British mathematicians and theoretical physicists to visit IHÉS and perhaps additionally use the opportunity to visit research groups in the Paris region. Visitors to IHÉS are selected by a Scientific Committee, with the help of its long term CNRS visitors. The selection meeting takes place twice a year (in June and in December) and the only criterion for selection is the scientific excellence of the applicants. Applications may be sent any time of the year before the deadline which is a week before each meeting.

Hodge Fellowships – Since 2001, the EPSRC and IHÉS annually offer two 1-year Hodge fellowships. The fellowships, named after the eminent British mathematician Sir William Hodge, enable outstanding young mathematicians and theoretical physicists to spend time at IHÉS. Applicants must have a PhD in Mathematics or Theoretical Physics obtained in 2002 or later. One of the two grants will be awarded exclusively to an applicant who has received his/her PhD from a UK University or has spent his/her last academic year in a UK university. Applications will be reviewed and selection in December 2006 will be made based entirely on the criterion of excellence established by IHÉS Scientific Committee. Starting date: Autumn 2007. Deadline for applications: **15 November 2006**.

IHÉS Visitors & Professors visiting the UK – Part of the IHÉS funding from EPSRC has been provided specifically to cover the travel and subsistence of IHÉS permanent professors and long-term visitors to visit the UK. EPSRC strongly encourages the UK mathematics community to maximise this opportunity to benefit from such international expertise. Visitors are listed on the IHÉS website (www.ihes.fr/IHES-A/People/professeurA.html) and Mrs Elisabeth Jasserand at IHÉS (email: jasseran@ihes.fr) should be contacted with regards to this travel fund. Further details about IHES can be found at the following link: www.ihes.fr/index-A.html.

Clarification on Collaborative Training Accounts

The Mathematical Sciences Programme has received confirmation that the following statement will be included in all CTA guidance.

'...Whilst a major objective of CTAs with respect to Masters level training is to encourage knowledge transfer through innovative forms of provision and the involvement of users in course development and delivery, it is fully recognized that there can be exceptions such as in some areas of the mathematical sciences...'

Stories for a new Cutting Edge Mathematics Brochure

In 2000, EPSRC produced a brochure called *Cutting Edge Mathematics* aimed at showcasing the mathematical sciences. Now we are planning a new brochure primarily aimed at decision makers and opinion formers. Therefore we need stories of cutting edge mathematical sciences research. If you have some exciting EPSRC – supported research that illustrates the importance of the mathematical sciences to the UK economy and society, we would love to hear from you. It may be that the exciting results have come many years after the initial EPSRC grant was awarded, or it may be the direct result of an award – either way we would welcome an update on your research. We will be looking for case studies that will appeal to the public in general, and specifically MPs – this is a key opportunity to illustrate why the mathematical sciences need to be supported in the future. Contact Katharine.Bowes@epsrc.ac.uk with any stories or for further information.

Postdoctoral Fellowships Call 2006

The Physics, Information and Communications Technologies (ICT) and Mathematical Sciences Programmes are offering Postdoctoral Fellowships to enable the most talented young researchers to establish an independent research career, shortly or immediately after completing a PhD. The awards are for a period of up to three years and cover the salary costs of the Fellow, travel and subsistence and equipment. Closing date: **Tuesday 26 September 2006**.

Mathematical Sciences Springboard Fellowships

Springboard Fellowships are aimed at mathematicians, statisticians and operational researchers, to promote adventurous research, mobility of researchers and collaborative research with other disciplines and industry. They provide short-term support to enable researchers in the mathematical sciences, who are permanent employees of an eligible research organisation, to work: at the interface with another discipline; with business or industry; on a particularly innovative project or a short-term feasibility study. The aim of these awards is to provide opportunities for researchers to take time out from their normal activities in order to develop their careers in new directions and to expose them to new ways of working, with the fellowship acting as a 'springboard' for their future research. These fellowships are intended to be 'pump-priming' support that will lead to new avenues of research, new collaborations, and follow-on research projects. Closing date: **26 July 2006**.

See a full list of current calls at www.epsrc.ac.uk/CallsForProposals/; details on the Mathematical Sciences Programme are at www.epsrc.ac.uk/ResearchFunding/Programmes/MathematicalSciences/.

NEWS FROM THE IMU

ICM 2006

The ICM 2006 Madrid has launched a weekly bulletin containing information about the congress: interviews with speakers, novelties in mathematical research, explanation of the content of the different sections and more. The bulletin is published electronically in English and Spanish. You can find it in Press Room at www.icm2006.org.

News from DCSG

Among its most recent initiatives, the Developing Countries Strategy Group (DCSG), together with the African Mathematics Millennium Science Initiative (AMMSI) and the London Mathematical Society, submitted applications to two of the United Kingdom's premier foundations, the Nuffield Foundation and the Leverhulme Trust. Both of these applications have had successful outcomes. The Nuffield Foundation awarded a £105,000 grant for a two-year pilot project to support mathematics and its teaching in the Anglophone countries of sub-Saharan Africa. Work under this grant is now in the initial stage of partnering mentors in the U.K. with institutions in Anglophone sub-Saharan Africa.

With respect to the second application, in which the International Centre for Mathematical Sciences (Edinburgh, UK) also joined, the Leverhulme Trust awarded a £150,000 grant for a three-year international programme in support of mathematics in sub-Saharan Africa, to commence later this year.

The first project focuses on mentoring partnerships between individual mathematicians in the UK and mathematics centres in Anglophone sub-Saharan Africa. The second has the coordinated aim of nurturing the next generation of African mathematicians and mathematical leadership in situ, focusing particularly on building the community of postgraduate students and young researchers. Both aim to combat the mathematics 'brain drain' of mathematical talent from sub-Saharan Africa by increasing the relative attractiveness of contributing one's mathematical expertise at home rather than moving permanently to the developed world. Building and maintaining bridges of shared research interests with individual and centres in the developed world is seen as an essential part of sustaining the community of postgraduate students and young researchers in Africa. In turn, sustaining the region's mathematical infrastructure is seen as essential to education and economic development.

In other news, IMU recently received a second major grant from the Niels Henrik Abel Memorial Fund towards its activities in sustaining and promoting mathematics and mathematicians in developing countries. These latter funds, besides supporting mathematics and mathematics education in Africa, are being employed *inter alia* to support the project of CIMPA-ICPAM (Nice, France) to rebuild the mathematical infrastructure in Cambodia, in cooperation with Vietnam and other countries in Southeast Asia.

The above items are taken from the 17th issue of the IMU electronic newsletter IMU-Net (see www.mathunion.org/Publications/Newsletter).

FUNCTION THEORY MEETING

This year's *One Day Function Theory Meeting* will be held on Monday 11 September, in the Hardy Room of De Morgan House. The meeting will be in honour of Professor Walter Hayman, whose 80th birthday is this year. The principal speaker will be Professor Walter Bergweiler (Kiel), who is attending with the support of the LMS. The LMS has also provided support to enable a limited number of research students to attend. For further details contact Phil Rippon (p.j.rippon@open.ac.uk).

BRITISH LOGIC COLLOQUIUM

The 2006 meeting of the British Logic Colloquium (BLC 2006) will take place in Oxford from Thursday 7 – Saturday 9 September. The talks on the Friday will be in honour of Wilfrid Hodges who retires this year, and the conference dinner will be on that evening. The following have accepted invitations to speak:

- Georg Gottlob (Oxford)
- Ian Hodkinson (Imperial)
- Jan Krajicek (Prague)
- Jeff Paris (Manchester)
- Anand Pillay (Leeds)
- Ralf Schindler (Münster)
- Simon Thomas (Rutgers)
- Gabriel Uzquiano Cruz (Ohio State/Oxford)
- Jouko Vaananen (Helsinki)
- David Wiggins (Emeritus, Oxford)
- Alex Wilkie (Oxford)

The meeting is made possible through support by the London Mathematical Society and the British Logic Colloquium. Particular support for postgraduate students has also been provided by the LMS. For further information contact one of organizers: Alex Wilkie (wilkie@maths.ox. ac.uk) or Boris Zilber (zilber@maths.ox.ac.uk) or visit the website www.maths.ox.ac.uk/logic/blc06.shtml.

Potential participants may also like to know that on the Oxford Workshop in Model Theory is taking place on the three days immediately preceeding the BLC meeting.

THE CMS DIARY

Spring 2006

The Council for Mathematical Sciences (CMS) met at De Morgan House on 25 May. It has been a very active time since the last meeting of the CMS in February, particularly with plans to enhance and develop CMS, and CMS' meeting with Ruth Kelly, Secretary of State for Education and Skills, which took place on 28 March. The main business of the May CMS meeting began with the noting of a report of the meeting with the Secretary of State: each of the themes of the meeting were addressed in turn, and both the DfES response to the issue and the CMS follow-up actions were considered in each case.

One of the topics raised with the DfES was the potential for Bologna compliance of the integrated masters course. In this light, the CMS Bologna/MMath Working Group presented its May report to the meeting, which had been prepared taking into account the DfES' assurances that the MMath, and similar courses, were not under threat from the Bologna agreement. The Working Group's report, and its response to the Burgess consultation, will be available on the CMS website www.cms.ac.uk, and the meeting noted that there were still some causes for concern in this issue.

To follow up on the Bologna theme, and to raise the issues of regional provision and threats to mathematics departments, the CMS will be seeking a meeting with Sir Alan Wilson, the DfES Higher Education Adviser. A policy paper on these items is in preparation: the CMS will also be comparing with similar groups in Physics and Chemistry, and whether joint action may be appropriate.

The CMS was pleased that, following the meeting with the Secretary of State, the DfES accepted that the numbers of mathematics undergraduates are not increasing dramatically but are at best level. A letter to Lord Sainsbury, who had also been quoting these erroneous figures, will go towards correcting previously publicised statements. Changes in HESA methodology and definitions had led to misleading comparison of data between some years.

A topical theme from the Ruth Kelly meeting was our offer to produce a brief note on the aims and possible hazards of the development of a second mathematics GCSE, which had been announced at an ACME conference earlier in that month. The CMS agreed that acting as an Advisory Committee, it would provide a balanced and objective note as a set of 'traffic lights' for the development, but without being overly prescriptive. The CMS will be liaising with ACME regarding creating a response.

Acting as an advisory board was at the heart of the plans to develop and fund an enhanced CMS along the lines recommended in the Smith report. The form, and the potential for independence, of this body was a considerable item for discussion, and the aims, objectives, structure, membership, funding and programme for a new body were all considered in detail. The CMS assessed a proposed model for development along these lines, and is now be able to approach a candidate for the position of independent chair. The body would aim to provide a view from the mathematical sciences – not just drawing on the expertise and position of the three societies, but also from users, employers and other beneficiaries from mathematics. Other organisations would also be affiliated or associated with the new body. However, the existence of this body would not preclude the IMA, RSS and LMS from making their own statements on an issue.

In March, the Government released the consultation *Science and innovation investment framework 2004-2014: next steps*. The CMS has now assembled a Working Group to prepare a response to this document, including the proposals for a post-RAE system in respect of a metric-based approach to research quality (which raises particular concerns for the mathematical sciences). The group will be asked to prepare a response to the Eastwood-Wilson consultation on this topic when it is published.

Continuing the *Progression to…* series of UCAS guides, the CMS has now completed its contribution to the Mathematical Science and Engineering edition, which was produced together with the ETB. UCAS expect to publish in the next few weeks.

The bid for a HEFCE-funded study, in response to an invitation to develop profile-raising activities in the mathematical sciences, has now been submitted: a decision would be made by HEFCE in June. The study aims to widen participation from groups of learners who have not previously been well represented in Higher Education, and to increase the supply of mathematical science graduates in England so that the demands of industry, commerce and education might be better met.

A CMS-EPSRC liaison group has now been established to meet with representatives from the EPSRC Mathematical Sciences Programme. The April meeting saw discussion of such topics as Doctoral training grants allocation procedures and the CTA system, along with some reflections on the implementation of FEC. The group will meet again in July.

The CMS plans to meet with Sir Peter Williams, Chair of ACME, in July, and it has been suggested that a similar interaction with HEFCE might be arranged. The CMS next meet in De Morgan House on 2 November.

Martin Smith
CMS Secretariat

VISIT OF PROFESSOR R. GEOGHEGAN

Professor Geoghegan (State University of New York, Binghamton) will visit the UK from 13-28 July. Professor Goeghegan is known for his work in geometric topology, group theory and applications to dynamics. During his visit he will be based at Durham University and will also lecture at Universities of Edinburgh (13-15 July) and Newcastle (19 July). For more information contact Michael Farber (Michael.Farber@durham.ac.uk).

LONDON MATHEMATICAL SOCIETY

REAL SOCIEDAD MATEMÁTICA ESPAÑOLA

SPECIAL LECTURES

Two intriguing and brilliant lectures for a very wide mathematical audience.

Friday 25 August 2006

International Congress of Mathematics 2006, Madrid

18:00 – 18:15	LMS business RSME business
18:15 – 19:00	Robert Bryant (Duke University, USA) *Aufwiedersehen surfaces, revisited*
19:15 – 20:00	Godfried Toussaint (McGill University, Canada) *Musical rhythm and computational mathematics*

This is part of the Program of Special Activities being held during the ICM 2006 in Madrid.

The LMS business will include the presentation of the 2005 Whitehead Prize certificates to Professor Ben Green and Dr Peter Topping, the election of new members, and an opportunity for members to sign the Membership Book.

The RSME business will include the award of the 2005 José Luis Rubio de Francia Prize for young mathematicians to Dr Javier Parcet.

As they become available more details can be found at
www.icm2006.org/scientificprogram/specialactivities/

BRIDGES

Bridges: Mathematical Connections in Art, Music and Science is an annual conference dedicated to mathematics, art and music which attempts to find connections and common ground between mathematicians and artists. The conference was founded in the USA in 1998, and in some years it meets elsewhere in the world. *Bridges London 2006* will be held at the Institute of Education (IoE) in London between 4 and 9 August, and it is being organised by a team at the London Knowledge Lab (part of the IoE) working together with others based in the USA. The aim of *Bridges* is to bring together artists of all types and mathematicians for talks and discussions to provide opportunities to present their work, meet each other, and exchange ideas. The two groups are broad churches, comprising visual arts, textile design, sculpture, architecture, and music on the artist side, and mathematicians (pure and applied), computer scientists, physical scientists and engineers on the mathematical side.

The conference has over 100 papers covering a wide range of topics. A number of LMS members will be speaking including Professor Caroline Series on *Non-Euclidean symmetry and Indra's pearls*, Dr Meurig Beynon on *Mathematics and music – models and morals*, Dr John Rigby on *Creating Penrose-type Islamic interlacing patterns*, Professor Ioan James on *Mathematics, music and autism* and Professor Mike Field on *Illuminating chaos – art on average*. The UK is well represented on the arts and architecture side, notable speakers being Brady Peters and Xavier DeKestelier from Foster and Partners on using Smart Geometry in Architecture and the sculptor Peter Randall Page on his work at the Eden Project in Cornwall. The wide range of the topics is also matched by the international nature of the speakers and with well known mathematicians such as the knot theorist Prof Louis Kauffman speaking on the Borromean rings. Art in all its aspects is an excellent way for mathematics education to be made more interesting, and *Bridges* will also have a set of workshops for teachers.

There will also be a mathematical art exhibition in the Jeffrey Hall at the IoE and other extra events. A Mathematical Musical event is also being held on the Monday evening (7 August) which is open to the general public and free. This offers entertainment consisting of musical performances linked to mathematics, including the pianist Robert Craig playing a piece composed by the late H.S.M. Coxeter. Professor Robin Wilson and Dr David Acheson (more LMS members) will be part of this evening. Also, on Wednesday after the conference, the LMS is supporting a Family Day in conjunction with the Royal Institution. In part this is a celebration of the 25th anniversary of the founding of the Royal Institution Mathematics Masterclasses by Professor Sir Christopher Zeeman following his set of Royal Institution Christmas Lectures on *Mathematics into pictures*. There will be a set of short masterclasses by Sir Christopher Zeeman, Professor Chris Budd, Dr Colin Wright and Professor Alan Davies in the morning and a Zometool workshop. The afternoon will be a Maths Fair with lots of practical activities from Bridges Participants. This is another free event where *Bridges* is aiming to engage with the general public.

Recent copies of the LMS *Newsletter* have put forward some views of the links between mathematics. The above descriptions only hint at a wider range of topics to add to the debate. You can find more details of the conference at www.lkl.ac.uk/bridges. The Proceedings are published in advance of the conference, and if you can't find time to join in, there is a 700 page book for you to keep you busy for many months. This is available from www.tarquinbooks.com in St Albans.

John Sharp
Visiting Fellow, IoE

CETL-MSOR CONFERENCE

From 11-12 September, the Maths, Stats & OR Network will be hosting its first major conference in conjunction with the related Centres of Excellence in Teaching and Learning (CETLs) at Loughborough University.

The aim of this conference is to promote, explore and disseminate emerging good practice and research findings in Mathematics and Statistics support, teaching, learning and assessment. The conference will appeal to all those teaching Mathematics, Statistics or Numeracy, whether this is to specialist mathematics students or students studying components of mathematics within their degree programmes (such as bioscience, chemistry, computer science, economics, engineering, nursing, physics, psychology, social work, etc).

The conference will explore not only the issues at the transition to university but any issues throughout the entire student learning experience – from foundation year through to post-graduate level. This will be achieved by a combination of key-note speeches, plenary sessions, hands-on demonstrations, workshops, poster sessions and discipline-specific discussion sessions. The themes are:

- National changes
- Innovative uses of technology and m-learning
- Supporting the specialist student in Mathematics and Statistics
- Mathematics and Statistics support for the non-specialist
- Supporting students with disabilities
- Developing learning resources
- Using e-learning and e-assessment
- Pedagogic research

The conference will produce refereed proceedings of accepted papers. An abstract accepted for a session within the conference programme will entitle one delegate to a residential place at a reduced price of £49.

Full residential rate (includes all conference fees, B&B, lunches and refreshments throughout the two days and the conference dinner): £99. Attendance on the 11 and/or 12 (price per day): £20. Conference dinner: £35.

To register for the conference complete our online registration form – the organisers will then contact you to organise payment via an invoice. Contact the Conference Administrator, Janet Nuttall on 0121 414 7095 if you would prefer to pay by credit card (Visa or Mastercard only).

For the latest details on CETL-MSOR 2006 including details on how to submit abstracts, please visit the conference webpage: www.mathstore.ac.uk/conference2006.

MIDWEST GEOMETRY CONFERENCE

The 2007 Midwest Geometry Conference will take place from 18-20 May 2007 at Iowa City, Iowa, USA. The conference will be held in honour of Thomas P. Branson, who died suddenly on 11 March 2006. The 2007 conference will deal with conformal geometry and Q-curvature, Lie theory and representations, PDEs and geometric measure theory, mathematical physics, determinants of conformal operators on 4-manifolds, geometric and harmonic analysis, spectral invariants, *p*-harmonic geometry, geometric flows, complex and Riemannian geometry, convex geometry, minimal varieties, symmetric criticality, and algebraic geometry.

The following researchers, among many others, have indicated an interest in attending and/or speaking at the conference: William Beckner (University of Texas), Sun-Yung Alice Chang (Princeton University), Michael Eastwood (University of Adelaide), Charles Fefferman (Princeton University), Rod Gover (University of Auckland, New Zealand), Oussama Hijazi (University of Nancy), Kengo Hirachi (University of Tokyo), Claude LeBrun (Stony Brook University), Andrea Malchiodi (SISSA, Italy), Rafe Mazzeo (Stanford University), Kate Okikiolu (University of California, San Diego), Bent Orsted (Aarhus University), Eero Saksman (Helsinki University), Peter Sarnak (Princeton University), Michiel van den Berg (University of Bristol), David Vogan (Massachusetts Institute of Technology), Paul C. Yang (Princeton University).

For further information visit the webpage www.math.uiowa.edu/MGC2007. The sponsors are the US National Science Foundation and the University of Iowa.

EDINBURGH MATHEMATICAL SOCIETY PROGRAMME

Edinburgh Mathematical Society 2006-07 programme is as follows:

2006

13 October, Edinburgh (AGM), A. Connes
10 November, Strathclyde, A. Wathen
8 December, Heriot-Watt, C. Grebogi

2007

19 January, Edinburgh, T. Bridgeland
16 February, Edinburgh, K. Ball
16 March, Dundee, B. Sandstede
27 April, Stirling, M. Proctor
25 May, Aberdeen, J. Chuang

For further information contact Tom Lenagan (tom@maths.ed.ac.uk).

BRITISH TOPOLOGY MEETING

The 21st British Topology Meeting will take place at Gregynog Hall, Powys, Wales, from 11-13 September. As in previous years, the aim of the meeting is to provide British Topologists with an opportunity to meet and discuss their own research, to listen to lectures from international specialists, and to provide a friendly audience for postgraduate students giving perhaps their first conference talks. The invited speakers are Ralph Cohen (Stanford) and Kathryn Hess (EPFL, Switzerland). Details of other speakers will be posted on the conference webpage www-maths.swan.ac.uk/btm21/. For further details please see the webpage or contact Martin Crossley (M.D.Crossley@swansea.ac.uk).

TOPOLOGY AND THEORETICAL COMPUTER SCIENCE CONFERENCE

IN HONOUR OF PETER COLLINS AND MIKE REED

A conference on Topology and Theoretical Computer Science in honour of Peter Collins and Mike Reed will take place in Oxford from 7-10 August. There will be sessions on Topology and Algebra, Continuum Theory and Dynamics, Set Theoretic Topology, and Theoretical Computer Science. Contributed talks are very welcome.

The aim of the conference will be twofold. First, to showcase the best of current research in these areas; and second, to celebrate the work and influence of Peter Collins and Mike Reed. They and their students have contributed to all of the areas mentioned. Invited presenters are:

- A.V. Arhangel'skii
- H. Bruin
- M. Hrusak
- J. Kennedy
- M. Mislove
- L. Oversteegen
- A.W.R. Roscoe
- J. van Mill

Some financial assistance is available for graduate students. The organisers gratefully acknowledge the support of the London Mathematical Society and the EPSRC. All details may be found on the conference homepage: www.maths.ox.ac.uk/~knight/Conference.

LOW DIMENSIONAL GEOMETRY AND TOPOLOGY

2006-2007 Warwick Symposium

Main Organiser: Caroline Series
Scientific Committee: David Gabai (Princeton), Ursula Hamenstaedt (Bonn), Misha Kapovich (UC Davis), Steven Kerckhoff (Stanford), Yair Minsky (Yale), Jean-Pierre Otal (Lille)

Symposium Workshops:

Monday 4 – Saturday 9 September 2006
Analytic aspects of low dimensional geometry
Organisers: Samuel Lelievre, Vlad Markovic and Caroline Series.
Registration forms can be found at www2.warwick.ac.uk/fac/sci/maths/forms/sympw1reg/. For further details see below.

Monday 26 – Saturday 31 March 2007
Geometric flows and related topics
Organiser: Peter Topping

Monday 9 – Thursday 12 July 2007
3-manifold geometry and topology
Organisers: Marc Lackenby and Daryl Cooper

Friday 13 – Saturday 14 July 2007
David Epstein 70th Birthday Celebration
Organisers: Vlad Markovic and Caroline Series

Monday 16 – Saturday 21 July 2007
Hyperbolic structures on 3-manifolds and large scale geometry of Teichmüller space
Organisers: Brian Bowditch and Caroline Series Longer term visitors are anticipated mainly in May-July.

For participation and further information please contact the Warwick Mathematics Research Centre, mrc@maths.warwick.ac.uk.

Analytic aspects of low dimensional geometry workshop
11am Monday 4 September – 12.30 pm Saturday 9 September 2006
Organisers: Samuel Lelievre, Vlad Markovic and Caroline Series

This workshop will highlight some important recent developments in the geometry of surfaces and Teichmüller theory.

The following will each give a series of expository talks:

- Francis Bonahon (University of Southern California) *Quantum Teichmüller theory*
- Maryam Mirzakhani (Clay Institute/Princeton) *Simple curves and the volume of moduli space*
- Anton Zorich (Rennes) *Flat surfaces and Teichmüller dynamics*

Provisional list of speakers:

- Stephane Baseilhac (Grenoble, France)
- Cliff Earle (Cornell, USA)
- Vladimir V. Fock (Moscow, Russia/Brown, USA)
- Kirill Krasnov (Nottingham)
- Greg McShane (Toulouse, France)
- Athanase Papadopoulos (Strasbourg, France)
- Igor Rivin (Temple University, Philadelphia, USA)
- Makoto Sakuma (Osaka, Japan)
- Jean-Marc Schlenker (Toulouse, France)
- Tan Ser Peow (Singapore)

For online registration for this Workshop go to: www2.warwick.ac.uk/fac/sci/maths/forms/sympw1reg/.

BSHM NEWS

History of Mathematics in Education
The *Millennium Mathematics Project* (http://mmp.maths.org) is a mathematics education initiative for ages 5 to 19 and the general public, based at the University of Cambridge but active nationally and internationally. The BSHM and MMP have begun working together to raise the profile of history of maths in the MMP's activities and publications.

Members are invited to contribute to a number of initiatives by writing articles or short pieces linking mathematics education with the history of mathematics. If you have an interesting piece

cont'd

of news in this area, know of a project, or would like to contribute with an article, your views and contributions would be very much appreciated.

Can you suggest mathematical games, puzzles, articles, problems, or projects? We are particularly looking for short pieces to support the use of the history of mathematics in a mathematics classroom and which can be published in our *Bulletin* and/or on the Millennium Mathematics Project websites. NRICH (http://nrich.maths.org) is a monthly online magazine publishing free mathematics enrichment resources for pupils of all ages, including discussion forums and a mathematics thesaurus. *Plus* (http://plus.maths.org), published monthly, is an internet magazine which aims to introduce readers to the beauty and the practical applications of mathematics. Contact Snezana Lawrence (snezana_l@hotmail.com) for more information about how to submit a contribution.

MOTIVATE (http://motivate.maths.org) is a real-time videoconferencing project for schools that enables students of all ages (5-18) to work with professional mathematicians and scientists, and with other school students their own age both in the UK and internationally. Are you a potential video-conference presenter? For more information contact Eleanor Robson (er264@cam.ac.uk).

History and Pedagogy of Mathematics Newsletter
The HPM Newsletter is the communication of the International Study Group on the Relations between History and Pedagogy of Mathematics. The Newsletter can be downloaded from the HPM website at www.clab.edc.uoc.gr/hpm/.

Mathematicians behaving badly: Greenwich's place in the history of mathematics
This will take place at the Royal Institution at Greenwich in the Burnside Lecture Room, King William Court, University of Greenwich at 7 pm on Thursday 13 July as part of the Royal Institution programme. The cost is £8 and £5 for RI members. More details at www.rigb.org/rimain/calendar/detail.jsp?&id=278.

17th Novembertagung
The 17th *Novembertagung* will take place in Edinburgh from 3-5 November. *Novembertagung* is an annual meeting of young researchers in the history and philosophy of mathematics from around the world. It is seeking papers from current or recent PhD students in these fields. Forms can be downloaded from the website www.17th-novembertagung.net/ and should be submitted to contact@17th-novembertagung.net by 16 September 2006 at the latest.

COMPLEX ANALYSIS AND POTENTIAL THEORY

A conference on *Complex Analysis and Potential Theory* (an ICM 2006 satellite meeting) will take place at the Gebze Institute of Technology, near Istanbul, from 8-14 September. The conference topics are:

- General theory of univalent and multivalent functions
- Extremal problems for conformal and quasiconformal mappings
- Bloch functions, normal functions, normal families
- Covering theorems in conformal mapping theory
- Finely holomorphic functions and topological function theory
- Quasiconformal methods and Teichmüller theory; Fuchsian and Kleinian groups as dynamical systems
- Potentials and capacity, harmonic measure, extremal length
- Pluripotential theory
- Bergman spaces
- Potential theory on Riemannian manifolds
- Biharmonic and polyharmonic equations and functions
- Discrete potential theory
- Equations of mathematical physics and other areas of application
- Holomorphic mappings and correspondences
- Nonlinear potential theory

Detailed information is available from the website: www.gyte.edu.tr/iccapt.

CMMSE 2006

The sixth Conference on Mathematical Methods in Science and Engineering (CMMSE 2006) will take place at University Rey Juan Carlos, Spain from 20-23 September. This conference aims to be a unifying, cross-cutting, interdisciplinary gathering, where specialists can have exposure to diverse fields, a chance to meet new people in or near their individual areas of research, and participate in special sessions different from, but still close to, their own interests. The topics are:

- Computational biology
- Computational chemistry
- Computational engineering
- Computational mathematics
- Computational physics
- Computational statistics
- High performance computing
- Industrial mathematics
- Mathematical modelling in economy
- Mathematical models in medicine
- Mathematical models for the information society
- Space geodesy and space dynamics
- Computation in complex networks

The plenary speakers include:

- D. Belkic (Karolinska Institute, Sweden)
- S. Boccaletti (Istituto Nazionale di Ottica Applicata, Italy)
- E. Brandas (Uppsala University, Sweden)
- L. Brenig (University Libre, Belgium)
- I. Duff (Rutherford Appleton Laboratory, UK)
- D. Estep (Colorado State University, USA)
- B. Matkovski (Northwestern University, USA)
- S. Oharu (Chuo University, Japan)
- E.H. Twizell (Brunel University, UK)
- J. Xu (Pennsylvania State University, USA)

For further information visit the website www.urjc.es/cmmse2006.

MODERN MATHEMATICAL METHODS

A conference on *Modern Mathematical Methods in Science and Technology* will take place on the Island of Paros, Greece from 7-9 September 2006. The conference topics are:

- Differential equations and mathematical models
- Numerical analysis, Computational mathematics
- Applications of mathematics in economy
- Stochastic analysis, Modeling
- Optimization, Control theory
- Image and signal processing

Detailed information is available from the website: http://applied.math.uoa.gr/m3st.html.

ADVERTISING IN THE LMS NEWSLETTER

The LMS *Newsletter* is circulated to its 2,500 members (1,650 UK, 350 Europe, 500 rest of the world). The advertisement dimensions and prices are:

	Dimensions	Commercial	Non-Commercial
Centre fold	165 mm deep x 267 mm wide	£660	£550
Double page	165 mm deep x 267 mm wide	£630	£520
Full page	165 mm deep x 123 mm wide	£300	£250
Half page	80 mm deep x 123 mm wide	£160	£130
Half page	165 mm deep x 60 mm wide	£160	£130
Quarter page	80 mm deep x 60 mm wide	£90	£70

A discount is offered for six bookings or more (within a one year period). There is no agency commission. Please note the LMS does not sell or rent the mailing list. For further information contact Susan Oakes (oakes@lms.ac.uk).

RECORDS OF PROCEEDINGS AT MEETINGS

REGIONAL ORDINARY MEETING

held on *Monday 15 May 2006* at the University of Leicester. About 70 members and visitors were present for all or part of the meeting.

The meeting began at 10:45 am, with Professor J.F. TOLAND, FRS, FRSE in the Chair. Fifteen people were elected to Ordinary Membership: J. Aramayona, M.A. Berger, M.J. Fryers, M. Haskins, O. Hryniv, O. Kullmann, F. Mezzadri, J. Pila, M. Rathjen, R. Rouquier, J.M. Speight, P.J.R. Thompson, N. Virdee, I.G. Wood, J. Zimmer; seven people were elected to Associate Membership: S. Astill, A.W. Coward, M.R. Gould, D.S. Littlestone, D. Pauksztello, P. Ramsden, J.E. Sprittles; and four people were elected to Reciprocity Membership: S.V. Aksenov, J-S. Park, M.A. Rieffel, C. Wuthrich.

The Record of the Proceedings of the Society Meeting held on 10 February 2006 was signed as a correct record.

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

Dr F. NEUMANN introduced a lecture given by Martin Bridson on *Between Teichmüller space and outer space*.

Dr J. SCOTT introduced a lecture given by Hanspeter Kraft on *Compression of finite group actions and covariant dimension*.

After lunch, Dr Scott introduced a lecture given by Andrei Zelevinsky on *Laurent expansions in cluster algebras via quiver representations*.

Dr Neumann introduced a lecture given by Nigel Hitchin on *Geometric structures and the Teichmüller component*.

Professor Toland expressed the thanks of the Society to the local organiser and the speakers for putting on such an excellent meeting.

A dinner was then held at a nearby Indian restaurant, at which Professor Toland awarded the prize for the poster competition to Marianne Johnson from the University of Manchester for her poster *Standard tableaux and Klyachko's theorem*.

LMS MIDLANDS REGIONAL MEETING 2006

The Midlands Regional Meeting of the London Mathematical Society was held on Monday 15 May in the Ken Edwards Building at the University of Leicester. The meeting was opened by the President of the LMS, Professor John Toland, who then formally admitted new members to the Society.

The meeting this year featured four distinguished speakers from the UK and abroad. About 70 members and visitors, many of them coming from outside the UK, were attending the meeting. It was followed by a three-day workshop on *Teichmüller Theory and Cluster Algebras* bringing together about 40 experts from the UK and abroad, who discussed new fascinating interactions between algebra and geometry.

The first speaker of the day was Professor Martin Bridson from Imperial College London, who explored the exciting mathematical terrain *Between Teichmüller Space and Outer Space*. He started with a colourful introduction to the deep and fascinating analogy between lattices, mapping class groups, and automorphism groups of free groups. He then presented many results that develop aspects of this analogy concerning geometrical concepts like curvature and rigidity. Within this analogy, Teichmüller space emerges as an analogue of the symmetric space for the special linear group $SL(n, Z)$, and the corresponding object for the outer automorphism group of a free group is outer space.

The second speaker was Professor Hanspeter Kraft from the University of Basel in Switzerland. His lecture entitled *Compression of finite group actions and covariant dimension* draw attention to some fundamental questions concerning actions of finite groups on irreducible algebraic varieties. An important concept is that of a compression of such a variety and he addressed two basic questions, namely how much one can compress a given group action on a variety and how to classify incompressible varieties. These questions are directly related to the study of Galois coverings and equations for field extensions.

After the lunch break Professor Andrei Zelevinsky from Northeastern University in Boston, USA talked about *Laurent expansions in cluster algebras via quiver representations*. Cluster algebras were introduced and studied by Zelevinsky jointly with Sergey Fomin and have found exciting applications in many diverse areas of modern mathematics, like representation theory, Teichmüller theory, Poisson geometry, discrete dynamical systems, tropical geometry as well as algebraic combinatorics. The algebraic structure of a cluster algebra is encoded by a family of Laurent polynomials expressing distinguished generators, the so-called cluster variables in terms of an initial cluster consisting of finitely many algebraically independent cluster variables. In his lecture he gave an interpretation of these Laurent polynomials due to Chapoton and Caldero in terms of the geometry of Grassmannians of quiver representations.

During the tea and coffee break there was a poster session with display of posters created by postgraduates from many departments around the country and from abroad. A prize of £100 worth of books was offered by Springer for the best poster to be judged by the four speakers of the meeting. During the day participants could also enjoy exhibitions of books and journals by the LMS and Springer.

The final speaker of the meeting was Professor Nigel Hitchin from the University of Oxford, who gave a very inspiring lecture on *Geometric structures and the Teichmüller component*. It turns out that certain interesting geometric structures of Riemann surfaces arise in a very natural way in the Higgs bundle treatment of the Teichmüller

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component of representations of a surface group in a split real form of a Lie group. In his lecture he described some of these important concepts and relations and their fascinating deep links with the theory of integrable systems.

The meeting was formally closed by the LMS President and Professor Alexander Veselov from Loughborough University announced that the LMS Midlands Regional Meeting in 2007 will be held in Loughborough followed by a workshop on tropical geometry.

After the meeting, many members and visitors enjoyed the conference dinner held in the Indian restaurant *Shimla Pinks* on London Road in Leicester, during which the President of the LMS announced also the winner of the afternoon's poster competition. The jury consisting of the four speakers of the day decided that the book prize should be given to Marianne Johnson from the University of Manchester for her poster entitled *Standard Tableaux* and *Klyachko's Theorem*.

The LMS workshop on *Teichmüller Theory and Cluster Algebras* which followed the Regional Meeting covered a number of topics exploring fascinating new connections between cluster algebras and the theory of decorated Teichmüller spaces and related moduli spaces. The workshop featured many experts in the field among them Philippe Calderon (Lyon), Frédéric Chapoton (Lyon), Leonid Chekhov (Moscow), Sergey Fomin (Ann Arbor), Louis Funar (Grenoble), William Harvey (London), Robert Marsh (Leicester), Robert Penner (Los Angeles), Michael Shapiro (Lansing), András Szenes (Budapest), Dylan Thurston (New York), Alexandr Usnich (Paris) and Andrei Zelevinsky (Boston). Besides well-received introductory lectures on Cluster algebras by Fomin and on Teichmüller theory by Penner the workshop talks featured new ideas and directions with a number of topics including quantization of Teichmüller spaces, Y-systems, Laurent phenomenon, Cluster-tilting theory, Poisson structures, mapping class groups of infinite surfaces and Weil-Petersson geometry. One of the main connections between Teichmüller space and cluster algebras studied at the workshop was the realisation that the so-called 'shear coordinates' for the Teichmüller space forms a Y-system, which is part of the algebraic skeleton of a cluster algebra. Another important aspect of the workshop concerned the theory of laminations for a punctured surface, which allows for the construction of acluster algebra with a 'universal' coefficient system.

Frank Neumann
Joshua Scott
University of Leicester

REVIEWS

Worlds of Flow: a history of hydrodynamics from the Bernoullis to Prandtl, Olivier Darrigol, Oxford Univ. Press 2005, 356 pp. hardback, £35.00.

Darrigol's Preface begins with a quotation from a William Thomson letter of 1857: 'Now I think hydrodynamics is to be the root of all physical science, and is at present second to none in the beauty of its mathematics'. Though Thomson may have exaggerated, fluid dynamics remains one of the most challenging areas of applied mathematics and one of the most important in its practical applications.

Until now, the subject has not been well served by historians. These works stand out: the scholarly introductions by C.A. Truesdell to two volumes of *Euler's Opera Omnia*, describing theoretical advances from Newton to Laplace; and H. Rouse and S. Ince's *A History of Hydraulics*. As the only general history is Tokaty's eccentric *A History and Philosophy of Fluid Mechanics*, Darrigol's book is most welcome.

The book is divided into seven more or less self-contained chapters, each on a key aspect: the (non-viscous) dynamical equations, water waves, viscosity, vortices, instability, turbulence, drag and lift; and there is a short concluding chapter. Some chapters are updated and condensed from Darrigol's earlier papers. The scope, though wide, excludes some important topics, being limited mainly to 'aspects of fluid mechanics in which compressibility and thermal effects play no role'. In fact, Helmholtz's work on acoustics is briefly considered in the chapter on vortices; but gas dynamics (or 'pneumatics' as it was previously called) and thermal convection are ignored.

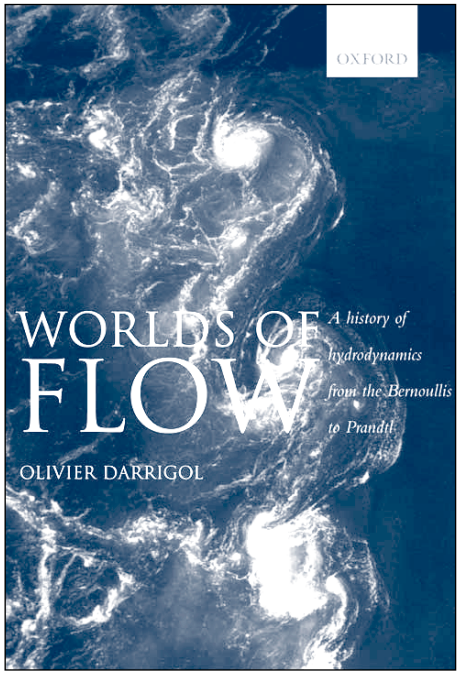
The exposition combines commendable scholarship, based on close familiarity with original sources, with a balanced judgment of the importance of the various theoretical ideas and experiments. The mathematics is presented in abbreviated modern form, including use of vector and Cartesian tensor calculus: though such anachronism may offend historical purists, most scientists will welcome it. A fair knowledge of fluid mechanics is assumed, both mathematically and in physical discussion. There is a light scattering of typos, which ought to be corrected in any reprintings.

For long, there was little meeting of minds between mathematical hydrodynamicists and practical hydraulicians, because the hydrodynamical equations yielded few solutions that agreed even roughly with observations. Notable exceptions were water waves and vortices; and the greatest failure was the resistance experienced by solid bodies moving through a fluid – d'Alembert's notorious paradox predicted *zero* drag for all bodies.

The development of the 'Navier-Stokes equations' of viscous flow (but Cauchy, Poisson and St Venant lent a hand), experimental and theoretical studies of flow instabilities, and semi-empirical models of turbulent hydraulic flows were key topics of the 19th century. So too was the study of drag and lift, originally for ship design and ballistics, but later crucial to aerodynamics. In 1905, Prandtl's heuristic simplification of the Navier-Stokes equations yielded the less intractable 'boundary-layer equations' (only later rigorously justified as a formal limit when viscous effects are small and confined to thin layers). Prandtl's study of boundary layers uncovered the true mechanism of flow separation from bluff bodies, and so the resolution of d'Alembert's paradox.

All this and more is authoritatively discussed by Darrigol. This book deserves a place in every university library, and it will surely be read with much interest, and some surprise, by many applied mathematicians.

Alex D.D. Craik
University of St Andrews

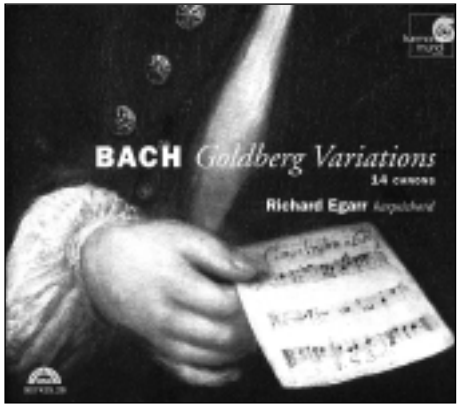


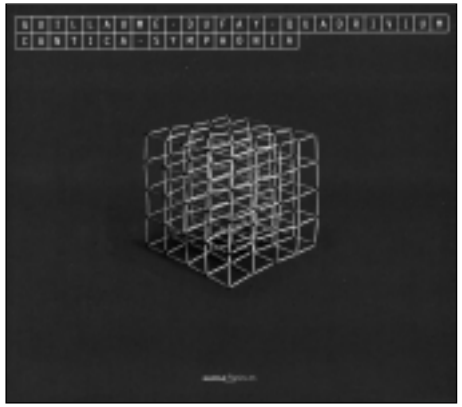
Mathematics and Music

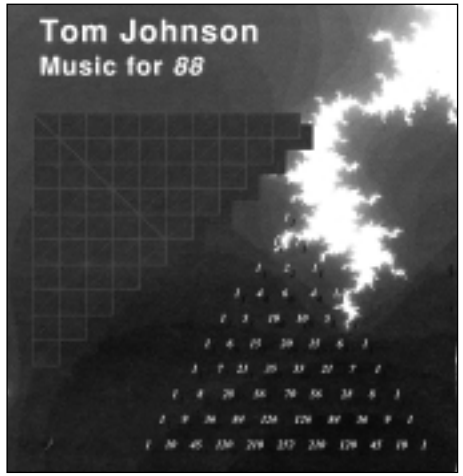
BBC Radio 4's discussion programme *In our time*, introduced by Melvyn Bragg, occasionally chooses topics in mathematics or the history of mathematics. On 25 May the topic was 'Mathematics and Music', and the guests were Marcus du Sautoy, Ruth Tatlow and Robin Wilson. Marcus began by drawing an analogy between a piece of music and a mathematical proof, and the programme continued by considering a range of mathematical ideas which arise in music, from rhythm to tuning systems, mathematical structures used by composers, Fourier analysis, and numerology, and including an explanation by Ruth of the numerical structure of the opening of Mozart's *The Marriage of Figaro*. The illuminating conversation included some real maths – Marcus's analysis of the mathematical coincidence that gives us a twelve-semitone scale was enthusiastically received. If you missed the programme, you can hear it at www.bbc.co.uk/radio4/history/inourtime/inourtime_20060525.shtml.

A number of recent recordings might be of interest for mathematical reasons. Various Greek writings on music and the mathematical theory of music have survived, but no notated music. Conrad Steinmann has reconstructed Greek instruments and produced a fascinating CD of 'newly imagined' music, *Melpomen: Ancient Greek Music for an Athenian Symposium of ca. 450 BC*, performed by Ensemble Melpomen (Harmonia Mundi HMC 905263).

Quadrivium (Glossa GCD P31901) is a recording of motets by the fifteenth-century composer Guillaume Dufay by the Italian group Cantica Symphonia. It comes with an extensive booklet essay on the mathematics of music by one of the performers, Guido Magnano, who happens to be in the







Mathematics Department of the University of Turin. Magnano's essay provides a clear exposition of the mathematics underlying Renaissance music theory and its connection to Dufay's music on the CD, and concludes by pondering the different abilities of our ears and our eyes in perceiving proportion. If you want the essay without buying the CD, the booklet can be downloaded at www.glossamusic.com/downloads/pdf/P31901.pdf.

For those interested in tuning theories, a new recording from the German company Raumklang will be exceptionally interesting. The Earle His Viols with the soprano Evelyn Tubb and the harpist Marie Nishiyama explore the sound-world of the musical academy of Cardinal Barberini in Rome in the 1630s, when performers were adapting their instruments so that every key could be played in just intonation, without the compromises required by other tuning systems. The CD includes music written to explore these harmonies, by composers such as Gesualdo, Mazzocchi and Kapsberger: a recent rave review in *International Record Review* by Carl Rosman described this as 'quite simply one of the most extraordinary discs ever to have come my way.' The CD is *La Tavola Cromatica* (Raumklang RK2302).

Musicologists have long debated what Bach meant by 'The Well-Tempered Clavier' for which he wrote his 48 preludes and fugues (two in each major and minor key) – did he intend equal tempering, or some temperament in which the keys would have different properties? Last year the American scholar Bradley Lehman claimed to have found the solution by decoding the decorative drawing at the top of the title page as a schematic representation of Bach's tuning system. Lehman's papers, and the controversy following their publication, can be followed in the pages of the journal *Early Music* for 2005 (for what it's worth, I'm not convinced!) But we can now hear Lehman's rediscovered 'Bach's Temperament' on a new recording by the harpsichordist Richard Egarr of Bach's Goldberg Variations and Goldberg Canons (Harmonia Mundi HMU 907425.26, 2 CDs).

On *In our time* Robin Wilson referred to Ernst Toch's famous 'Geographical Fugue': if you don't know it, I recommend an excellent performance by the Dunedin Consort (*Dunedin Consort Live*, DCCD102, www.dunedin-consort.org.uk). And if you want music that is more explicitly mathematical you might like to investigate the works of Tom Johnson on the experimental US label XI. *Music for 88* contains pieces called 'Mersenne Numbers', 'Multiplication Table', 'Euler's Harmonies', 'Abundant Numbers' and 'Pascal's Triangle'. The last of these is typical: Johnson simply plays each of the possible chords available from a subset of *n* notes for *n* from 1 to ten. I should warn that some may find the music no more exciting than this description (XI106, available via www.xirecords.org).

Tony Mann
University of Greenwich

EPSRC

Topics in Arithmetic Geometry

LMS/EPSRC Short Course

King's College London, 28 August – 1 September 2006
Organiser: Professor David Burns

This course provides an introduction to three topics that underlie much of modern arithmetic algebraic geometry. The course lecturers are:

- Professor David Burns (King's College London)
  Iwasawa Theory
- Professor Kevin Buzzard (Imperial College)
  Modular Forms
- Professor Fred Diamond (King's College London)
  Galois Representations

Lectures will be accompanied by daily examples classes led by Dr Manuel Breuning (King's College London), Dr Toby Gee (Imperial College) and Dr Payman Kassaei (King's College London).

The course is aimed primarily at postgraduate students in number theory/ arithmetic geometry or any related fields but much of it should be accessible to anyone with a reasonable knowledge of basic concepts in algebraic number theory. Postdocs and young researchers are welcome to attend. For further details (including reading lists) see the course website at: www.mth.kcl.ac.uk/research/numbtheo/shortcourse/.

The registration fee to attend is £100. The accommodation costs for all UK-based research students are covered by EPSRC. Participants must pay their own travel costs. EPSRC-supported students can expect that their registration fees and travel costs will be met by their departments from the EPSRC Doctoral Training Account. Postdocs and non-UK students will be required to pay their own subsistence costs and the registration fee (approximately £365 in total).

Application forms may be obtained from Isabelle Robinson, Administrative Officer, London Mathematical Society (email: robinson@lms.ac.uk, tel: 020 7291 9979, fax: 020 7291 9978) or an on-line form is available on the LMS website: www.lms.ac.uk/activities/research_meet_com/short_course/31_poster.html.

Numbers will be limited and those interested are advised to make an early application. The closing date for applications is **Friday 14 July 2006**. All applicants will be contacted by the London Mathematical Society approximately one week after this deadline; we will not be able to give information about individual applications before then. Please do not send any money until we ask.

LONDON MATHEMATICAL SOCIETY

POPULAR LECTURES 2006

Institute of Education, London University – Wednesday 12 July
Birmingham University – Wednesday 27 September

Dr Emma McCoy

From Magic Squares to Sudoku

'This talk will look at the properties of Magic Squares, Latin Squares and Sudoku, showing that they are more than just a recreational pastime!'

16	3	2	13
5	10	11	8
9	6	7	12
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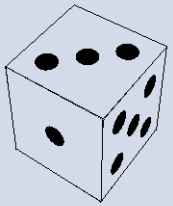

Dr John Haigh

How likely is that?

'Answers to questions about probability are often surprising, and may even seem paradoxical. But a logical approach shows why these answers arise.'

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

LONDON Commences at 7.00pm, refreshments at 8.00pm, ends at 9.30pm. Admission is free, with ticket. Apply by **4 July** to Lee-Anne Parker, London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HS (email: parker@lms.ac.uk). A stamped addressed envelope would be appreciated.

BIRMINGHAM Commences at 6.30pm, refreshments at 7.30pm, ends at 9.00pm. Admission is free. Enquiries to Dr Chris Sangwin, School of Mathematics, University of Birmingham, Birmingham B15 2TT (tel: 0121 414 6197, email: C.J.Sangwin@bham.ac.uk).

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).

JULY 2006

3 LMS Northern Regional Meeting, Leeds (349)
3-5 Surgery, Theory Past, Present and Future Meeting, ICMS, Edinburgh (347)
3-5 Sequential Monte Carlo Methods, St Anne's College, Oxford (349)
3-7 Randomness and Complexity Workshop, Bristol (344)
3-7 Games and Verification Conference, INI, Cambridge (347)
3-13 Dynamical Systems and Statistical Mechanics LMS Durham Symposia, Durham (345)
10 Groups and Computation: A Leedham-Green Fest, Queen Mary, University of London (349)
10-14 Methods of Non-equilibrium Statistical Mechanics in Turbulence, LMS/EPSRC Short Course, Warwick (348)
10-14 New Directions in Applied Probability ICMS Workshop, Edinburgh (342)
10-14 Mathematics for Industry Conference, Madrid (347)
12 LMS Popular Lectures, London (350)
12 Andrei Tyurin – A memorial celebration, Warwick (348)
14-21 Quantum Probability, Information and Control, Nottingham (349)
16-12 Aug Atlantic Association for Research in Mathematical Sciences, Nova Scotia, Canada (345)
17-21 Extremal Kähler Metrics and Stability ICMS Workshop, Edinburgh (342)
20-26 International Mathematics Competition, Odessa, Ukraine (345)
24-28 Spectral Theory and Its Applications Workshop, INI, Cambridge (343)
31-4 Aug Noncommutative Geometry and Cyclic Cohomology Conference, INI, Cambridge
31-5 Aug Introduction in Galois Theory of Differential and Difference Equations LMS Invited Lectures, M.F. Singer, ICMS, Edinburgh (350)

AUGUST 2006

1-30 Sep Dynamical Chaos and Non-equilibrium Statistical Mechanics, Singapore (348)
4-9 Bridges Conference, London (350)
5-7 Pure Mathematics Conference, Islamabad (349)
6-12 Algebraic Theory of Differential Equations ICMS Workshop, Edinburgh (348)
7-10 Topology and Theoretical Computer Science Meeting, Oxford (350)
10-11 Exactly Solvable Systems in Quantum Field Theory, York (349)
10-12 Mathematical Knowledge Management Conference, Wokingham (347)
11-21 Methods of Integrable Systems in Geometry LMS Durham Symposia, Durham (345)
13-19 Triangulated Categories, Leeds (348)
22-30 International Congress of Mathematicians 2006, Madrid (346)
25 LMS-RSME Special Lectures, ICM Madrid (350)
28-1 Sep Topics in Arithmetic LMS/EPSRC Short Course, King's College, London (349)
29-2 Sep Relations and Kleene Algebra in Computer Science, Manchester (349)

SEPT 2006

4-8 Noncommutative Geometry and Physics, INI, Cambridge (349)
4-9 Stability, Coupling Methods and Rare Events, LMS/EPSRC Short Course, Heriot-Watt (349)
5-9 Algorithmic Aspects of Semigroup Theory Workshop, St Andrews (350)
7-9 Modern Mathematical Methods in Science and Technology Conference, Paros, Greece (350)
7-9 British Logic Colloquium, Oxford (350)
8-14 Complex Analysis and Potential Theory Conference, Istanbul (350)
9 Computational and Algorithmic Aspects of Semigroup Theory, St Andrews (350)
11 Function Theory Meeting, London (350)
11 LMS Midlands Regional Meeting, Bath (350)
11-12 CETL-MSOR Conference, Loughborough (350)
11-13 British Topology Meeting, Gregynog Hall (350)
11-15 Painlevé Equations and Monodromy Problems: An introduction, INI, Cambridge (347)
12-15 Analysis and Stochastics of Growth Processes LMS Workshop, Bath (346)
15-16 Celebration of Bryan Birch's 75th Birthday, Bristol (348)
18-21 All Hands Meeting, East Midlands Conference Centre, Nottingham (347)
18-22 Painlevé Equations and Monodromy Problems: Recent Developments, INI, Cambridge (347)
20-22 Credit Risk under Lévy Models ICMS Workshop, Edinburgh (342)
20-23 Mathematics Methods in Science and Engineering Conference, Spain (350)
25-29 Australian Mathematical Society Annual Meeting, Sydney (348)
27 LMS Popular Lectures, Birmingham (350)
29-30 Heilbronn Institute Annual Conference, Bristol (349)

OCTOBER 2006

13 Edinburgh Mathematical Society Meeting, Edinburgh (350)
20 UK TeX Users Group, De Morgan House, London (348)
30-3 Nov Recent Advances in Monte Carlo Based Inference Workshop, INI, Cambridge (348)

NOVEMBER 2006

10 Edinburgh Mathematical Society AGM, Strathclyde (350)
17 LMS AGM, London
20-24 Stochastic Computation for the Analysis of Ecological and Epidemiological Data Workshop, INI, Cambridge (348)
27-22 Dec Geophysical Fluid Dynamics and Scalar Transport in the Tropics, Singapore (348)

DECEMBER 2006

8 Edinburgh Mathematical Society Meeting, Heriot-Watt (350)
18-22 Trends in Noncommutative Geometry, INI, Cambridge (349)

JANUARY 2007

19 Edinburgh Mathematical Society Meeting, Edinburgh (350)

FEBRUARY 2007

16 Edinburgh Mathematical Society Meeting, Edinburgh (350)

MARCH 2007

16 Edinburgh Mathematical Society Meeting, Dundee (350)

APRIL 2007

27 Edinburgh Mathematical Society Meeting, Stirling (350)

MAY 2007

18-20 Midwest Geometry Conference, Iowa, USA (350)
25 Edinburgh Mathematical Society Meeting, Aberdeen (350)

JULY 2007

16-20 ICIAM 2007, Zurich, Switzerland (349)

JULY 2008

14-18 Fifth European Congress of Mathematics, Amsterdam, Netherlands (342)

ROBERT ALEXANDER RANKIN
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Extract from the citation: Professor Rankin has made many major contributions to the theory of numbers, and in particular to the theory of modular forms. His work extends over a broad range of central problems, and his papers show both great scholarship and mathematical taste. His striking achievements include new estimates of the differences between consecutive prime numbers, results on the distribution of zeros of Poincaré series and work on cusp forms. His method of constructing modular forms has become a very powerful standard tool. However, his most remarkable papers are his seminal 'Contributions to the theory of the Ramanujan tau function and similar arithmetical functions'. These gave birth to the highly influential method now usually known as the Rankin-Selberg method.