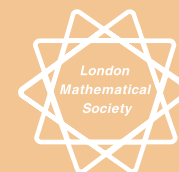


THE LONDON MATHEMATICAL SOCIETY



NEWSLETTER

No. 329 September 2004

Forthcoming Society Meetings

2004

**Friday 17 September
Exeter**

South West & South
Wales Regional
Meeting

R. Langlands
G. Henniart

[page 5]

**Friday 19 November
London**

Annual General
Meeting

D. Olive
P. Goddard

(Presidential Address)

COUNCIL DIARY

18 June 2004

The first item for discussion at the June meeting of Council was a draft proposal for the formation of an Advisory Committee for Mathematics Research and Industry, as recommended by the Smith Report. This new body would speak on behalf of the mathematical sciences community to government and others on the role of mathematics and mathematics research; it would complement ACME's role in relation to mathematics education. The draft proposal arose out of discussions at the Council for the Mathematical Sciences on 18 May, and will form a basis for further discussion with the CMS and with ACME. Much, including a name for the new body, remains to be decided, but the proposal, in principle, received strong support from Council.

The President's Report also prompted discussion of RAE 2008. An invitation to nominate for membership of panels and sub-panels was expected imminently, with a deadline of 15 September. (More details are given on page 4 of this *Newsletter*.)

The CMS is arranging a meeting with EPSRC to follow up on the International Review of Mathematics, and to discuss

how the issues and proposals in the report could be taken forward. Council discussed some recommendations put forward by Norman Biggs, and a tabled paper by Penny Davies on the implications of the CTA mechanism. Among other things, we are determined to press for improvements in doctoral training accounts, and to seek funding for the recruitment of academic mathematicians to cover the gaps created by the retirement of key researchers.

The first item for discussion in the Treasurer's report was the level of our subscriptions, which we shall raise by 10% this year; Council considers that this still represents a good deal. The budget for 2004/05 was discussed and agreed. The Treasurer had already been given a grilling by the Finance and General Purposes Committee, so discussion at Council was short. The Programme Secretary drew Council's attention to the fact that the Programme Committee budget had (in effect) been cut through a clarification of policy on reserves and unspent grants.

Under the report of the Publications Secretary, Council formally approved a 5.5% rise in the sterling prices of our standard journals, a slightly higher dollar price increase (to reflect exchange rates) and a

2% rise in the price of *Compositio Mathematica*. The Publications Secretary expressed some anxiety over subscription levels, which are falling. Publications income has been a very major contributor to the Society's income for several years, so this is certainly not welcome (but also not unexpected) news.

Stephen Huggett reported on the recent meeting of the new International Affairs Committee, when John Ball (President of the International Mathematical Union) had presented a review of its responsibilities as the UK 'Committee for Mathematics' within the Union. Stephen suggested that the LMS should consider setting up a web page devoted to IMU business. The Committee had recommended support for a request from John Ball for help supporting a new post to improve the IMU's work in poor countries (and this was now agreed by Council). The forthcoming EMS Council meeting had been discussed, and in particular the question of mathematics in Framework 6, the elections to the EMS executive, and EMS publishing. Martin Taylor had presented an excellent briefing on Anglo-Russian collaboration, including a proposal for a joint meeting between the London and Moscow mathematical societies.

The Education Secretary reported further on actions which followed up on the Smith report. A meeting would shortly take place between the Presidents of the CMS societies and the Secretary of State for Education and Skills. There would also be a meeting with Anita Straker, in her capacity as the interim Chief Adviser for Mathematics. The Education Committee had discussed at length the matters that should be covered in these meetings.

As the meeting drew to a close, David Abrahams reminded us that the IMA, rather younger than the LMS, would celebrate its 40th birthday with a celebratory event on Thursday 2 September.

Sarah Rees

NOT AMBER FOREVER

As the green leaves of summer begin to tinge with autumn brown, so the *Newsletter* takes on a new shade for the whole of its second year in colour. Readers can be assured that as winter approaches the *Newsletter* will not (intentionally) fall in pieces to the ground or turn all white.

Having toyed with the idea of a colour change every month, or every three months, the Editorial Board decided that keeping each academic year's issues the same colour would help readers to file their collections and would look more attractive on the shelves: we hope you agree. Whatever its colour, the *Newsletter* welcomes items of interest that any readers may like to tell us about: mathematics in the news, on the stage, cinema, radio or TV, in the art gallery or even in Parliament - in addition of course to the usual mainstream meetings, conferences and workshops. Items with visual impact are especially welcome: they can be any colour you like this year, as long as it is amber.

David Chillingworth

HONORARY MEMBERSHIP



The London Mathematical Society has elected Professor I.M. Singer to Honorary Membership of the Society. Professor Singer has been a leading figure in geometry and analysis for over fifty years. He has received many honours and prizes including the American Mathematical Society's Prize for Distinguished Public Service and the Steele Prize for Lifetime Achievement, as well as the US National Medal of Science. Together with Sir Michael Atiyah he was awarded the Abel Prize for 2004. Professor Singer is best known for his share in the Atiyah-Singer index theorem for elliptic operators on manifolds which was proved in the mid-1960s. This powerful tool not only gave an explanation for a host of earlier results in geometry

and topology, but also provided entirely new connections with other subjects such as number theory and also theoretical physics. Professor Singer was one of those responsible for establishing the very successful dialogue that has taken place in recent decades between geometers and physicists, introducing into mathematics viewpoints from quantum field theory which have radically changed the agenda in both geometry and topology.

CMS MEETS SECRETARY OF STATE FOR EDUCATION AND SKILLS

The three CMS Presidents, together with Nigel Steele (Hon. Sec., Education, IMA) and Peter Cooper (current CMS Secretary) had a meeting with the Rt Hon. Charles Clarke, MP, Secretary of State for Education and Skills, on 6 July 2004. The meeting had been arranged following earlier discussions between the LMS and Mr Clarke.

The CMS delegation welcomed the DfES response to the Smith Report and reiterated its support for implementation of the recommendations. Frances Kirwan (LMS) and Andy Grieve (RSS) put the CMS' case that the supply of mathematically-skilled people needed to be addressed as a whole, looking at all stages in secondary and higher education and research training. The erosion of the maths base in universities was a major problem, primarily brought about by a system in which students' choice was the main determinant of a department's viability. This was leading to closures and mergers, limiting student access in some areas and depriving schools and local businesses of access to mathematical expertise. Without an overarching strategic approach to provision in mathematics the Government's plans of increasing the supply of STEM-trained

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people could not be achieved. Radical ideas – necessarily involving money – were needed.

The Secretary of State commented on the CMS' points, but could not commit himself – but we would not have expected him to at such a meeting. In discussion several points were made that the CMS will consider further. The CMS will undertake, with HoDoMS, a survey of current maths provision (scale, location and trends). The CMS is already involved in a project (mainly funded by DfES) to provide careers-based materials to attract more young people to study maths post-16 and into university. The Secretary of State suggested that the CMS should engage the support of industry and commerce that was dependent on a strong mathematically-trained workforce and/or mathematical research.

Tim Pedley (IMA) noted the conclusions of the International Review of Mathematics, regarding the length of the training envelope for mathematics doctorates, and related this to the Bologna agreement and the uncertainties as to where funding for an intermediate stage would come from. Nigel Steele (IMA) agreed to provide the Secretary of State with a report that the CMS bodies are producing on the implications of Bologna on mathematics courses.

The Secretary of State also reiterated his support for the CMS' plans to establish an Advisory Committee on Mathematics Research and Industry, along the lines of the recommendation in the Smith Report. He would be interested to hear how those plans developed.

The CMS delegation left feeling that their case for mathematics and statistics had been heard sympathetically – there was still much to do to make the arguments strongly in the right quarters, but the CMS had been given some useful feedback on how it could take the matter forward.

NOMINATIONS FOR RAE 2008

Earlier this year the LMS, in conjunction with the IMA and RSS, set up a coordinating group to monitor the events leading up to RAE 2008. Its first task was to respond to the HEFCE consultation document RAE 2/2004. The response, which was circulated to members with the July *Newsletter*, set out our views on the positive and negative aspects of the RAE, and what should be done about them. In line with our recommendations, HEFCE decided to proceed with the structure under which Pure Mathematics, Applied Mathematics, Statistics and OR, and Computer Science are sub-panels of Panel F.

This decision was announced on 15 July, together with a call for nominations to be made by 15 September. The LMS Council had discussed the matter at its June meeting, and members of Council had been asked to suggest names to the President. At that time it was clear that the President would have to make difficult decisions on Council's behalf before the next meeting in October. The LMS is mainly concerned with the Pure Mathematics sub-panel, but we expect to liaise with IMA, RSS, and the CS community about the other sub-panels of Panel F. We will also work closely with HoDoMS. Subject coverage, geographical balance, and the other criteria proposed by HEFCE will require careful consideration.

The President will welcome suggestions for nominations from members of the Society, preferably by email to president@lms.ac.uk. It must be stressed that the overriding objective is to set up sub-panels that will have the confidence of the community as a whole. As a general guide, persons suggested should have the standing required to serve on the editorial board of an international journal.

Norman Biggs
General Secretary

LONDON MATHEMATICAL SOCIETY SOUTH WEST AND SOUTH WALES REGIONAL MEETING

Harmonic Analysis and Number Theory University of Exeter, Friday 17 September 2004

- | | |
|-------------|--|
| 3:15 – 3:30 | LMS Business |
| 3:30 – 4:30 | Robert P Langlands (IAS)
<i>The trace formula's potential
as a tool in number theory</i> |
| 4:30 – 5:00 | Tea/Coffee |
| 5:00 – 6:00 | Guy Henniart (Paris)
<i>Extending the Langlands conjectures:
p-adic representations of p-adic groups</i> |

The South West and South Wales Regional Meeting of the London Mathematical Society will be held on Friday 17 September at the University of Exeter. There will be a reception and dinner afterwards in the University Staff Social Centre. The cost will be £25 per person. Places must be reserved in advance: for this contact N.P. Byott (N.P.Byott@maths.ex.ac.uk) to whom cheques (made payable to University of Exeter) should be sent before **Friday 10 September**.

There are limited funds available to contribute in part to the expenses of members of the Society or research students to attend the Society meeting. Requests for support, including an estimate of expenses, may be addressed to the Programme Secretary at the Society (web: www.lms.ac.uk; email: grants@lms.ac.uk).

This will be followed by a workshop on *Harmonic analysis and number theory* from 18-20 September. Speakers include: D. Bump (Stanford), K. Buzzard (Imperial), S. deBacker (Harvard), W. Duke (UCLA), G. Henniart (Paris), W. Hoffmann (Durham), R. Langlands (Princeton), E. Lapid (Hebrew), W. Luo (Ohio), C. Moeglin (Paris), W. Müller (Bonn).

Some financial support for attending the workshop is available for research students at UK institutions and for participants from countries other than North America, Western Europe and Australia. The workshop programme, together with local arrangements and other information, is on the web (www.maths.ex.ac.uk/~anton/LMS-2004/title.html) or contact the organisers: Anton Deitmar (a.h.j.deitmar@ex.ac.uk); Nigel Byott (n.p.byott@ex.ac.uk) or Robin Chapman (r.j.chapman@ex.ac.uk).

INTERNATIONAL REVIEW OF MATHEMATICS

The CMS met the EPSRC Chief Executive, John O'Reilly, and the Mathematical Sciences Programme Manager, Annette Bramley, on 2 August to discuss the outcomes of the International Review of Mathematics. Input to the meeting included all the views expressed by the community, received via e-mail, letter and at the Community Meeting in May.

The discussions looked at doctoral training, in particular the quality, breadth and duration of PhDs in the UK. The EPSRC was able to confirm that an increase in funding for EPSRC PhD studentships awarded through the DTA to take the average PhD duration to 3.5 years will be coming on line for those starting in October 2004. The meeting considered how that additional resource could be used, and the potential for universities to make best use of the increased average PhD duration in the future to enhance the quality of PhD training in mathematics. The matter of Masters level training was also taken up, including the quality of MMath courses, Collaborative Training Accounts, and HEFCE funding of Masters courses.

The IRM had identified some very worrying aspects of the recruitment and retention of staff in particular areas, not least in statistics. This is a particularly complex issue involving many 'players' – the Funding Councils as well as the Research Councils, and the individual universities themselves. We heard how EPSRC was planning to help through its new Research Leadership Capacity initiative.

The final area touched on was the role of the national research institutes – in particular INI and ICMS as identified by the Review.

The outcomes of the meeting will be developed further and reported to the community through this *Newsletter* and other means in due course.

ADVISORY COMMITTEE ON MATHEMATICS RESEARCH AND INDUSTRY

One of the recommendations of the Smith Report on 14-19 mathematics education was that there was a need for a high-level advisory committee on mathematics as it affects higher education, research, industry and commerce, complementing the Advisory Committee on Mathematics Education (ACME). The CMS has considered this recommendation and noted that it the Council was itself created in part to present such a unified 'voice of mathematics'. It has therefore proposed to Adrian Smith and to the Department for Education and Skills that it should establish such a body.

The role of the proposed body would be to speak on behalf of the mathematical sciences community to Government and others on strategic-level issues concerning the role of mathematics and mathematics research in the economy and society, especially in relation to industry, business and the financial sector, complementing ACME's role in relation to mathematics education.

It would provide a coherent view on matters affecting the mathematical sciences in higher education, research, business and industry, responding to Governmental and Parliamentary inquiries, public and private, and discussing with funding agencies for higher education and research the means to achieve a strong mathematics base in the UK. It would facilitate communication between the mathematical sciences community and other stakeholders and explore common issues and potential solutions, including the preparation of reports on aspects of mathematics research and its application.

It is expected to have two levels of membership – a core committee primarily of members proposed by the major mathematical organisations plus some *ex officio* members,

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ISBN 3-11-017237-2

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and an 'outer circle' containing a larger number of related organisations in mathematics and related areas in academe, government, business and industry.

The proposal is still being developed and discussions on the remit, membership, programme and funding of such a body are continuing over the summer. The proposals have been raised with the Royal Society, ACME, JMC and at the CMS' meeting with the Secretary of State for Education and Skills; in all cases they have been widely supported.

MATHEMATICS POLICY

Universities UK/SCOP/HEFCE/Higher Education Academy Consultation 'Towards a Framework of Professional Teaching Standards'

The Society has made a response to this report. It recommends that initial professional development (IPD) and continuing professional development (CPD) for academic teachers should be subject-specific and carried out in association with the learned societies in order to achieve the highest standards of teaching practice. There is access to the full version of this response on the LMS website.

Government response to the report by Professor Adrian Smith FRS on Post-14 Mathematics 'Making Mathematics Count'

The CMS has welcomed the recommendations made by Education and Skills Secretary Charles Clarke for reform of 14-19 mathematics education, in line with the Smith Report. There is access to the full version of this response and the CMS Press Release on the LMS website.

Mathematics Promotion Unit (MPU) collaboration with Heads of Departments of Mathematical Sciences (HoDoMS)

The MPU will be collaborating with Professor Charles Goldie of HoDoMS to acquire data on mathematics education and research, in line with the recommendation of the Smith Report that HoDoMS and the CMS investigate patterns of applications and acceptanc-

es into mathematical sciences degrees. The CMS and HoDoMS have also agreed to carry out a survey of the distribution of mathematics courses across the UK, following the CMS meeting with Education and Skills Secretary Charles Clarke.

Chancellor of the Exchequer Gordon Brown, 2004 Spending Review

The Chancellor's Spending Review announced that Government funding for science will rise by £1 billion by 2008 to support science teaching in schools, improve salaries for graduate scientists and support private and public research and development, in line with the Government's Ten Year Framework for Science and Innovation.

INTERNATIONAL AFFAIRS COMMITTEE

Council has noted the increasing international activity of the Society: its roles as adhering body to the IMU (and ICMI), its schemes with mathematicians abroad, its links with the European Mathematical Society, and so on. It has decided, therefore, to establish an International Affairs Committee, incorporating the former IMU Liaison Committee, to oversee these activities and advise Council accordingly. Its membership is as follows:

- Programme Secretary (*ex officio*, chair)
- Publications Secretary (*ex officio*)
- The LMS representative on the Royal Society Scientific Unions Committee (currently John Ball)
- ICMI National Representative (currently Derek Woodrow)
- A person with links to the European Mathematical Society (currently Sir John Kingman)
- Nominees of the Edinburgh Mathematical Society, the Royal Statistical Society, and the Institute for Mathematics and its Applications (currently Peter Rowlinson, Peter Green and John Hogan respectively)
- Two members *ad hominem* (currently Martin Taylor and Florence Tsou)

The first meeting was held in June. Professor John Ball gave an overview of the Committee's role as the UK 'Committee for Mathematics' as required by the IMU Statutes, and we agreed that it would be useful to have an 'international affairs' area on the LMS website, with appropriate links to the IMU and other bodies. The Committee looked at the agenda for the forthcoming EMS Council meeting, to provide a briefing for the LMS delegation. Links with the Anglo/Russian collaboration committee were discussed, and two new proposals considered. Members felt that it had been very valuable: we will be meeting once per year and conducting business by email in the interim.

Stephen Huggett

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IMA-LMS WORKING GROUP

A meeting of the IMA-LMS Working Group took place on 18 May 2004 at De Morgan House.

- The meeting considered the progress that had been made by the Framework Study Initiative (FSI), which is investigating possible structures for supporting the activities of the two societies, including a full merger. The FSI had met on 18 February, 31 March, and 10 May and is planning to meet again in July and September, with the intention of producing an interim report for the two Councils in October/November. At this stage the FSI is investigating aspects of a 'single Council' model. A number of difficult questions arise, for example: finance, investments and reserves; membership categories, professional registration and the link with Chartered Mathematician status; and the composition of the Council. Other models are also under consideration.
- It is intended that the interim report will address all aspects of these complex issues. The report will be considered by the two

Councils, and, if they so decide, there will be a wider consultation with the members of the organisations during 2005.

- The meeting noted that several committees now have some form of cross-representation. It was agreed that this kind of collaboration should continue, irrespective of the eventual outcome of the Framework Study.
- David Youdan (IMA Executive Director) and Peter Cooper (LMS Executive Secretary) reported on discussions at the recent BMC and BAMC meetings about future collaboration between the Colloquia, following the meeting held at De Morgan House earlier in the year.
- The LMS reported that it had established a Mathematics Promotion Unit, primarily aimed at policy makers and the media. The IMA expressed interest in the possibility of participating in the work of the unit.

The Group agreed to meet next on Friday 12 November 2004.

Norman Biggs
Charles Evans

LMS MEMBER AWARDED NATIONAL TEACHING FELLOWSHIP

Dr David Acheson, Fellow in Mathematics at Jesus College, Oxford and member of the LMS, has been awarded a National Teaching Fellowship worth £50,000 in recognition of his outstanding contribution to learning and teaching. He will be presented with his award by the Rt Hon. Alan Johnson, Minister for Lifelong Learning and Higher Education, at a celebration dinner in London on 9 September 2004.

Dr Acheson is well known for his innovative and inspiring teaching methods, which include playing an electric guitar in lectures to demonstrate the mathematical theory of vibrating strings. In addition to his teaching and research at Oxford, he has given a num-

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AMERICAN MATHEMATICAL SOCIETY

*The Evolution of an
International Mathematical Community*



Mathematics Unbound: The Evolution of an International Mathematical Research Community, 1800-1945

Karen Hunger Parshall, University of Virginia, Charlottesville, and
Adrian C. Rice, Randolph-Macon College, Ashland, VA, Editors

"These excellent proceedings further testify to the fact that the internationalization of mathematics is a topic whose time has come." — *Mathematical Reviews*

The development of an international mathematical community was far from smooth and involved obstacles such as war, political upheaval, and national rivalries. Until now, this evolution has been largely overlooked by historians and mathematicians alike. This book is essential reading for anyone interested in the history of modern mathematics.

Copublished with the London Mathematical Society. Members of the LMS may order directly from the AMS at the AMS member price. The LMS is registered with the Charity Commissioners.

History of Mathematics, Volume 23; 2002; 496 pages; Hardcover; ISBN 0-8218-2124-5; List \$85; All AMS and LMS members \$60; Order code HMA7H23LMS04

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ber of public lectures including last year's LMS Popular Lecture, *Mathematics, Magic and the Electric Guitar*. He has also appeared on *Tomorrow's World* presenting his 'upside-down pendulums theorem,' and written *1089 and All That*, a book that attempts to bring the joy of mathematics to the general public.

Dr Acheson aims to use his award to establish a unique form of communication of mathematics, particularly to students who are just starting university. He plans to do this by writing an accessible and inspiring book on mathematics that is neither a conventional textbook nor a 'popular science' book, but one which draws on the best elements of both. The book will emphasise the aesthetic and practical sides of mathematics, helping readers to actually *do* maths, rather than just appreciate it. Dr Acheson will also create web-based interactive software to accompany his book, illustrating those aspects of mathematics that are best brought to life by moving images.

The National Teaching Fellowship Scheme was set up five years ago by the Higher Education Funding Council for England (HEFCE) and the Department for Employment and learning in Northern Ireland to recognise individuals who are excellent teachers and fund projects that will make a significant contribution to learning and teaching in Higher Education. The Scheme has awarded 50 fellowships this year, chosen from a total of 249 nominations. Dr Acheson won his award within the Experienced Staff category of the Scheme for wide dissemination of his teaching practices across the learning and teaching community.

Last year Professor Amanda Chetwynd, Lecturer in Mathematics and Statistics at Lancaster University and Vice President of the LMS, was awarded one of twenty National Teaching Fellowships for influencing and

inspiring students and colleagues and demonstrating a reflexive approach to teaching. Professor Chetwynd has used her award to develop a project that aims to bridge the gap between school and university mathematics, addressing issues such as the decline in mathematical competence of students entering higher education, the shortage of students choosing to study mathematics to degree level and the insufficient number of well qualified mathematics teachers in schools.

Professor Chetwynd began her Fellowship project this February. The project involves designing interactive activities to provide an introduction to probability and statistics. These activities adopt a problem-based learning approach, taking interesting and accessible examples from health, medicine and the environment to bring mathematics to life and emphasise its relevance to other disciplines and society as a whole. The activities aim to widen participation in mathematics by extending the learning resources for AS and A-Level teachers and students, and making links between A-Level and university-level course content.

The LMS congratulates Dr David Acheson and Professor Amanda Chetwynd on their awards and wishes them every success with their Fellowship projects.

**COLLINGWOOD
MEMORIAL PRIZE**

The 2004 Collingwood Memorial Prize has been awarded to Paul R. Buckingham, S. Cuthbert's Society, University of Durham. The Collingwood Memorial Prize, established in memory of Sir Edward Collingwood, FRS, President of the Society 1969-1970, is awarded to a final-year mathematics student at the University of Durham who intends to continue to a higher degree in mathematics at Durham or any other university.

UNIVERSITY OF CAMBRIDGE FACULTY OF MATHEMATICS

ADAMS PRIZE

Differential Equations

The Chairman of the Adjudicators for the Adams Prize invites applications. The Prize will be awarded this year for research achievement in the field of Differential Equations, interpreted in the broadest sense.

The prize is open to any person who, on 31 October 2004, will hold an appointment in the UK, either in a university or in some other institution, and who is under 40 (in exceptional circumstances the Adjudicators may relax this age limit). The value of the prize is expected to be approximately £15,000, of which one third is awarded to the prize-winner on announcement of the prize, one third is provided to the prize-winner's institution (for research expenses of the prize-winner) and one third is awarded to the prize-winner on acceptance for publication in an internationally recognised journal of a substantial (normally at least 25 printed pages) original article, of which the prize-winner is an author, surveying a significant part of the winner's field.

Applications (seven copies), comprising a CV, a list of publications, the work or works (published or unpublished) to be considered, and a brief non-technical summary of the most significant new results of these works (designed for mathematicians not working in the subject area) should be sent to:

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

(Enquiries may be emailed to: faculty@maths.cam.ac.uk.)

The deadline for receipt of applications is **31 October 2004**.

FERMAT PRIZE FOR MATHE- MATICS RESEARCH 2005

The Fermat Prize, awarded every two years by the Université Paul Sabatier, in Toulouse, France, rewards research in fields where the contributions of Pierre de Fermat have been decisive. These are:

- Statements of Variational Principles
- Foundations of Probability and Analytical Geometry
- Number theory

The spirit of the Fermat prize is focused on rewarding the results of research accessible to the greatest number of professional mathematicians within these fields. The amount of the Fermat prize has been fixed at €20,000, with the ninth award being announced in October 2005.

Rules governing the prize, candidacy formalities, etc. are available from the secretariat of the Fermat prize at *Prix FERMAT de recherché en Mathématiques*, Service Communication, Université Paul Sabatier, 118 route de Narbonne, 31062 Toulouse Cedex 4, France. This information is also available at www.ups-tlse.fr. The closing date for applications is **30 June 2005**.

UP AND COMING

Marcus du Sautoy is presenting *Five Shapes* on BBC Radio 4 at 9.30 am on Tuesdays in September.

EUROPEAN MATHEMATICAL SOCIETY COUNCIL MEETING

Uppsala, 26-27 June 2004

Uppsala seemed to be deserted, as if a John Wyndham story was taking place, but in fact it was only the Swedish midsummer holiday! The Council of the EMS met in the fine old University there, over two days. Our discus-

sions were mostly at the strategic level, because Council only meets every two years, and so the detailed work is done in between by smaller committees. The LMS delegation consisted of Frances Kirwan, Tsou Sheung Tsun, and myself.

There were over 90 delegates altogether, and so chairing the meeting was no joke, but the EMS President, Sir John Kingman, managed it in his relaxed style. After the President's report (during which he reminded us that the next President of the EMS takes office from January 2007) we moved on to elect several new corporate members to the EMS, and then we chose the new Executive Committee.

The rest of the meeting was devoted to reports from the various committees of the EMS: these covered a very broad range of activity, and I have only picked out a few here. Under publications, we heard from the new EMS Newsletter Editor and we had a presentation on the EMS Publishing House. Then there was a discussion on recent and proposed developments in *Zentralblatt*, such as the formation of a Scientific Advisory Committee, and how the Society can best support these.

Not surprisingly, the report from the 'Group on Relations with European Institutions' also led to animated discussion! Luc Lemaire explained that it is a minority view in EU institutions that pure research should be supported as an engine for future development. The majority view, heavily influenced by industry, is that the EU should only support short-term and immediately applicable research. This is the background to the difficulty that mathematics has in fitting into FP6, for example, and is partly why there has been intense lobbying from mathematicians in favour of the setting up of a European Research Council. EMS Council members were also asked to try to influence other scientists: the point was made that we certainly cannot assume that they appreciate

the importance (even in utilitarian terms) of supporting pure mathematics.

Vagn Lundsgaard Hansen spoke very well on behalf of the 'Raising Public Awareness' committee. His main point was to ask research mathematicians to give support to colleagues who devote time and energy to this increasingly important activity. In discussion it became clear that there was a need for national societies to do even more networking here.

We ended with a short discussion on the intriguing possibility of creating a 'Digital Mathematical Library'. Council felt that it was very important for European mathematicians to be involved, should this project take off. (There is some information at the site www.wdml.org.)

I was very impressed by all I learned about the EMS, and with the fervour of the newly converted I would urge you to rush out and join. While you are at it do visit the EMS website (www.maths.soton.ac.uk/EMIS/index.html) to browse the publications or learn about the various opportunities for summer schools and lectures.

Stephen Huggett

THE LMS AT 4ECM

A trumpet voluntary by J. Clarke heralded the Opening Ceremony of the 2004 European Congress of Mathematics (4ECM) in Stockholm, Sweden, on 28 June. Following stirring speeches by Ari Laptev, President of the 4ECM Organising Committee, John Kingman, EMS President, and the Rector and Chancellor of Stockholm University, the EMS prizes were announced (see below) and the Congress went into full swing with a truly impressive programme. The Congress was held in the very pleasant surroundings of the University of Stockholm, and the organisers are to be congratulated on laying on such an effective and enjoyable event.

As is traditional at such international

Congresses, the Society had a stand, which attracted great interest in the Society, its activities and its journals and books. About 70 people attended a Reception on Wednesday 30 June. The President was able to welcome Members, including two Honorary Members, officials of EMS and organisers of 4ECM, as well as many other friends and guests.

The Congress had been preceded by the EMS Council, held in Uppsala. The Society's delegation comprised the President, Dr Stephen Huggett (Programme Secretary) and Dr Florence Tsou (Oxford). A report appears on page 15.

ECM PRIZE WINNERS

Winners of the EMS Prizes 2004:

- Franck Barthe, Institut de Mathématiques Laboratoire de Statistique et Probabilités, Toulouse, France
- Stefano Bianchini, Istituto per le Applicazioni del Calcolo 'M. Picone', Rome, Italy
- Paul Biràn, School of Mathematical Sciences, Tel-Aviv University, Israel
- Elon Lindenstrauss, Clay Mathematics Institute, Massachusetts and Courant Institute of Mathematical Sciences, New York, USA
- Andrei Okounkov, Princeton University, USA
- Sylvia Serfaty, Courant Institute of Mathematical Sciences, New York, USA
- Stanislav Smirnov, KTH, Sweden and Geneva University, Switzerland
- Xavier Tolsa, ICREA and Universitat Autònoma de Barcelona, Spain
- Warwick Tucker, Uppsala University, Sweden
- Otmar Venjakob, Mathematisches Institut Universität Heidelberg, Germany

The Carl-Eric Fröberg Prize was awarded to Anna-Karin Tornberg, Stockholm, Sweden. Full citations are at www.math.kth.se/4ecm/prizes.ecm.html.



Sitting from the left: Xavier Tolsa, Paul Biràn, Sylvia Serfaty, Stefano Bianchini, Otmar Venjakob.
Standing from the left: Franck Barthe, Warwick Tucker, Nina Uraltseva (President of the Prize Committee),
Elon Lindenstrauss, Andrei Okounkov, Stanislav Smirnov.

EUROPEAN CONGRESS OF MATHEMATICS

4ECM was held at Stockholm University at the end of June. During the opening ceremony, the winners of the ten EMS prizes and the Carl-Eric Fröberg prize were announced. For a change, the announcement was not controversial: the prize committee had managed to award outstanding mathematical achievement, with a good spread of nationalities and subjects.

The Congress was an opportunity to hear about advances across the whole spectrum of mathematics, with a particular emphasis on applications. Taking advantage of the conference's location, the organising committee had been able to attract two Nobel prizewinners and four other scientists to talk about their work and its link with mathematics.

A further new feature was to hear European network co-ordinators talk about the mathematical progress achieved by their networks.

My selection of talks included subjects such as: waves in forest floor bacteria, knots as stable singularities in waves, the development of MRI scanning, evolutionary dynamics, isoperimetric inequalities, quantum chaos, complexity theory (and other talks with lengthier titles). Taking notes from Powerpoint lectures was difficult, so I'm looking forward to the publication of the conference proceedings by the EMS Publishing House (www.ems-ph.org), hopefully next spring.

Because of the new features, there were no 'round table' discussions, but it will be open to the organisers of 5ECM to restore them to the programme in Amsterdam in 2008.

David Salinger
EMS Publicity Secretary

RECORDS OF PROCEEDINGS AT MEETINGS

ORDINARY MEETING

held on *Wednesday 30 June 2004* at the Aula Magna, Stockholm University, during the Fourth European Congress of Mathematics. At least 70 members and guests were present.

The meeting began at 6.00 pm, with Professor F.C. KIRWAN, FRS, President, in the Chair. Professor Kirwan welcomed members and guests: the meeting provided an opportunity for overseas members to meet other members of the Society. She gave a particular welcome to Professor Lennart Carleson and Professor Serge Novikov, Honorary Members of the London Mathematical Society. She then welcomed guests, with a special welcome to Professor Ari Laptev, organiser of the European Congress of Mathematics, Sir John Kingman, President of the European Mathematical Society and Jean-Pierre Bourguignon.

Fifteen members signed the membership book. The meeting was followed by a reception.



Alexei Zhizhchenko, Lennart Carlson



Stephen Huggett, David Salinger, Tuulikki Makelainen



Frances Kirwan, Michael Berry

LMS RECEPTION AND STAND AT THE FOURTH EUROPEAN CONGRESS OF MATHEMATICS

Stockholm, 28 June – 2 July 2004



Stephen Huggett, Frances Kirwan, Jan Thomas



Victor Buchstaber, Elmer Rees, Michael Butler



LMS Stand: Jean-Pierre Bourguignon, Peter Cooper, Stephen Huggett, Frances Kirwan

FUTURE BMCS

Here are preliminary announcements of future meetings of the British Mathematical Colloquium (BMC).

The meeting 'Mathematics 2005' will incorporate the 47th meeting of the BAMC and the 57th meeting of the BMC. It will take place in Liverpool from lunchtime on Monday 4 April to lunchtime on Thursday 7 April. There will be one plenary talk each day aimed at the entire gathering, supplemented by 'plenary BMC' and 'plenary BAMC' talks. The remainder of the time will be devoted to concurrent activities following the traditional pattern of each colloquium. These will include 'morning speakers' and splinter groups in the BMC style, alongside minisymposia in parallel sessions following the BAMC model.

The plenary speakers will be J. Ball, M. Berry, N. Elkies, B. Fantechi, A. Friedman, A. Khovanski, V. Maz'ya, D. McDuff, G. Milton, J. Toland and W. Werner.

Special sessions and mini-symposia will include: Dynamical Systems, Algebraic and Arithmetic Geometry, Solid Mechanics, Mathematical Biology, Mechanics of Fluids and Asymptotic Analysis.

See www.maths.liv.ac.uk/colloquium for further details as they become available.

The 58th meeting of the BMC will be held at Newcastle University from 10 to 13 April 2006. The special sessions at this meeting will be devoted to Analysis and Geometry on Groups and to Operator Theory. Further details will be given later on websites and in this *Newsletter*.

The Scientific Committee of the BMC welcomes thoughts on the future of the BMC, and it also welcomes communications from those who would like to host a future BMC. For this, please contact Committee Chairman, Professor H.G. Dales, University of Leeds (garth@maths.leeds.ac.uk).

JOHN H.H. CHALK

Professor John Chalk, who was elected a member of the London Mathematical Society on 22 April 1954, died on 28 June 2004 in Vancouver, BC, aged 81. He was born and educated in London, obtaining a war time degree at Imperial College in 1943. He spent 1946-47 with H. Davenport at University College London, before becoming a research student at Trinity College, Cambridge, in 1947, working with L.J. Mordell. He went to Princeton in 1949-50 as a postdoctoral fellow, coming under the influence of E. Artin. From 1951 he was an assistant lecturer at Bedford College, London. In 1957 he moved to Canada, first to McMaster University, and then in 1963 to the University of Toronto. On retirement in 1988 he returned to London and until 1998 was a senior fellow at Imperial College London. John's early work was on convexity and the geometry of numbers, an interest which he retained throughout his career. He had many other interests in number theory, especially the theory of congruences and exponential sums. He obtained an external London PhD in 1948, a Cambridge PhD in 1951, and a Cambridge DSc in retirement. He was a Fellow of the Royal Society of Canada.

ROYAL INSTITUTION MASTERCLASSES

The Royal Institution has organised Mathematics Masterclasses for over twenty years. However, the scope and reach of the classes never ceases to amaze me. I had recently started organising the Masterclass programme when I heard the following heartening story.

Asylum seekers coming to this country between the ages of 14 and 16 may often find that their education suffers. When this came to the attention of Ian Porteous, president of Mathematical Education on Merseyside, he decided to take their maths roadshow to the local community college,

where steps are being taken to give emergency English schooling to refugee children. There were children present from all around the globe: Mongolia, Azerbaijan, Somalia, Yemen, Angola; a real test for the universality of the language of mathematics.

One young Somalian refugee caught Ian Porteous' attention. As with the other refugee children his personal story is woeful. He arrived in this country with his brother and sister but without his mother, father or anybody else to take care of him. In fact he does not know whether his parents are living or not. He has not been given the opportunity to attend school in this country, nor had he received any formal education before he arrived.

The Somali boy's ability shone and he, amongst others, was invited along to the weekly maths club. He has attended every week since and has quickly become one of the brightest, keenest members of the club. He now volunteers to help at maths events, on one occasion teaching the sponsor how to complete one of the harder puzzles.

The organisers of the maths club and the local community college are coming together to provide a GCSE maths crash course for this promising Somali youth, whose talents were discovered at a Royal Institution Mathematics Masterclass.

Royal Institution Mathematics Masterclasses are organised regionally, mainly by groups of local volunteers. There is a network of centres around the UK organising around 60 series each year. Each series consists of between five to ten classes usually for Year 8 or 9 students (12 to 14 year olds).

Masterclasses are designed to stimulate and encourage mathematically promising students by introducing them to aspects of mathematics that are not usually found in the school curriculum. Their emphasis is on exploration and enjoyment for all concerned. Topics are chosen by each lecturer, who varies from week to week, to reflect his or her personal interest. This can be anything from algebra to cryptography and from dinosaurs to mazes; there is

THE GLASGOW MATHEMATICAL JOURNAL LEARNING AND RESEARCH SUPPORT FUND

Grants in support of Scottish Mathematics

The fund aims to support mathematical projects which have demonstrable benefit to mathematics in Scotland. This includes conferences, workshops and summer schools in Scotland, lecture tours in Scottish universities and the publication of lecture notes or other monographs associated with such activities. Grants of up to £1,000 are available.

There are two rounds of awards each year. Closing dates for application are the last days of October 2004 and January 2005. It is hoped that confirmation of awards will be made within about three months from these dates. Further information and application forms are available from the address below or on the web at www.maths.gla.ac.uk/gmj/gmj-trust. Application should be made to: Dr C. Athorne, Secretary G.M.J. Trust Fund, Department of Mathematics, University of Glasgow, University Gardens, Glasgow G12 8QW (tel: 0141 330 5176, email: gmj@maths.gla.ac.uk).

no typical Masterclass. The lecturers are chosen for their ability to communicate their enthusiasm and excitement for their subject.

For further information about your nearest Masterclass group contact Katie Chicot, (kchicot@ri.ac.uk).

Katie Chicot
Clothworkers' Fellow in Mathematics

SCIENTIFIC PUBLICATIONS: FREE FOR ALL?

... is the title of the latest report from the House of Commons Science and Technology Committee and it has some important implications for publishing at the LMS. The full report can be found at www.parliament.uk/commons/selcom/s&thome.htm. In my alternative role as Junior Cub Reporter for the *LMS Newsletter*, I trotted off to the Press Conference last month and (in common with several other heavily-disguised publishers) picked up a free copy of the report. The Chairman Dr Ian Gibson expressed great pleasure at the number of people at the conference and at the public hearings of the Select Committee. In his experience, the largest number of people ever attended the four sessions of the Science and Technology Committee earlier in the year when oral evidence was presented.

The Select Committee's main conclusion is that the current model of scientific publishing is unsatisfactory and it believes that the 'author-pays' publishing model could be viable and was not convinced by many of the arguments mounted against it. It also thought that the costs of peer review should be met through submission fees, rather than successful authors having to pay for the cost of others' mistakes. It encourages further experimentation, particularly to establish the impact that such models would have on learned societies.

The Select Committee recognises that many learned societies rely heavily on pub-

lishing income to keep their programme of activities going and they fully approve of the good work that is done. However, although it noted the threat to learned societies' income, it was unable to offer any assurance that societies would be protected against fallout from its recommendations. A local conclusion is that it is up to us at the LMS to look after our own and, in this respect, the LMS is way ahead (see the next *Newsletter* item on the LMS open access policy).

Initially, the Select Committee appeared to be interested in issues concerning peer review, but there is very little about this in the final report – it came to the simple conclusion that it was a good thing, and it recommends that current publishing standards be maintained. It also looked at the question of retrodigitization of the paper archive and praised the work of the British Library in this respect. It believes that Government should move immediately towards the compulsory deposit of non-print publications at the national libraries.

The Committee's major recommendation is that all UK higher educational institutions establish 'Institutional Repositories' in which their published output can be stored and from which it can be read, free of charge, online. The Report also recommends that Research Councils and other Government funders mandate their funded researchers to deposit a copy of all articles in this way. The committee criticised HEFCE and recommended that HEFCE be required to provide good national data on library budgets. However, it accepts that, despite the lack of detailed data, there is a real problem in library funding and feel that moving to the author-pays model would have benefits in the UK.

This conclusion has been disputed by some learned societies and publishers, who claim that the UK is a net exporter of both research and published journals. The argument is that if the government has to give the author funds to have his or her article published

then the national bill to universities would be greater than the existing sum of UK library budgets. The fact that the UK is host to some of the largest STM publishing groups means that the loss of income received from overseas libraries would not be recovered through income from overseas authors. This is certainly true in the case of the LMS, where less than 14% of our subscription income from journals originates in the UK and about 23% of our authors are British based. However, the Committee recommended that, despite these arguments, the UK Government should act as a proponent for change on the international stage and lead by example.

The response: LMS Open Access Policy

Council discussed a variety of publishing models earlier in the year and came down against the introduction of an author-pays model for mathematics, recognising two big problems. First, mathematicians from poorer countries cannot pay and, even if the fee is waived upon application, such a policy would be divisive. Second, it is very unusual for a mathematician from any country to survive on research funds; most are paid by universities. The author-pays model assumes that a research funder will allocate a portion of the funds given for a project to publication costs and the scientist will draw on that budget when the paper is published. Clearly, that doesn't work for mathematics!

However, we do not work in a vacuum from the rest of society and government policy is driven by people such as the Science and Technology Committee that reflect the whole of science. The economics of journal publishing and the models that librarians are willing to deal with is driven by 'big science', predominantly bio-medical research, and policy changes are heavily influenced by bodies like the Wellcome Trust and the Public Library of Science. A small mathematics publisher like the LMS finds that sales are influenced by what it happening to the rest of the average

university library budget and the revolution towards an author-pays model will affect us even if we don't adopt the policy.

Over the last year alone we have experienced a 10% increase in the number of papers submitted to the *Bulletin, Journal and Proceedings*, without any discernable drop in quality. It may be that authors are making a policy decision to support learned society publishing and recognise that the profits are being recycled back into the LMS programmes that support mathematics. However, libraries are not following this example and are still cancelling subscriptions, so we have to look at ways to protect the income to the Society. We thought about whether to extend open access to older papers but instead we have come up with a unique response that we hope will best serve the mathematics community for the present, without hitting our income too hard in the long term.

At present, anyone can freely access the most recent two issues of the Bulletin, Journal and Proceedings and download the full text of the articles. You can access the articles via our web pages or directly from Cambridge journals online at <http://journals.cambridge.org/public/door>.

By setting the most recent issues free, we hope to encourage mathematicians to read and cite papers published in our journals and that this will increase the visibility of the journals. It should also encourage the best authors to submit papers in the knowledge their work will be seen now, rather than waiting for an archive to become freely available after some years. This is a one-year trial and the Publications Committee will review the policy in October 2005. If you have any views you would like the LMS to consider, please write to the Publications Secretary, Jim Howie, or myself and it will be reported to the Publications Committee.

Susan Hezlet
LMS Publisher

VISIT OF PROFESSOR A.S. MOROZOV

Professor A.S. Morozov (Sobolev Institute of Mathematics, Novosibirsk) will be visiting the UK for a month from 11 October supported by a Scheme 2 LMS grant. Professor Morozov is an acknowledged expert on automorphism groups of computable structures, and theories of finitely generated groups. He will be giving lectures at the universities of Leeds, Cambridge, QMUL and Manchester. For more information contact Professor J.K. Truss (j.k.truss@leeds.ac.uk).

VISIT OF PROFESSOR M.J. FIELD

Professor M.J. Field (University of Houston) is visiting the Department of Mathematics of Imperial College London as a Leverhulme Visiting Professor, from September 2004 until July 2005. Professor Field's research interests lie in the area of dynamical systems with emphasis on bifurcation theory with symmetry and ergodic theory. In the context of his Leverhulme position, he will give a series of Leverhulme lectures. Details of these lectures will be posted on the DynamIC website www.ma.ic.ac.uk/DynamIC. For further information contact Jeroen Lamb, Department of Mathematics, Imperial College London (jeroen.lamb@imperial.ac.uk).

EULER DAY

A meeting on Singular Euler Dynamics will take place on Monday 18 October at the University of Warwick, organised by R. Kerr, J. Robinson, and X. He. The aim is to review recent developments in the mathematical theory and numerical simulation of the incompressible Euler equations, in the context of possible finite-time singularities. It is hoped that the meeting will provide an opportunity to exchange ideas, and in particular to discuss adaptive numerical algorithms. Invited speakers are:

- Y. Brenier (Nice, France)
- J.D. Gibbon (Imperial)
- R. Grauer (Bochum, Germany)
- R. Kerr (Warwick)

There will also be a poster session. Interested participants should contact X. He (xinyu@maths.warwick.ac.uk). For further details see www.maths.warwick.ac.uk/miraw. This Euler Day is supported by Mathematical Interdisciplinary Research at Warwick. Limited funds are available from a London Mathematical Society grant to pay expenses of nonspecialists from the UK wishing to learn more about these topics.

MATHS GOES UNDERGROUND

The Isaac Newton Institute (INI) has reproduced its beautiful and very popular Maths on the Tube posters as a booklet. The booklet - Maths Goes Underground - is available directly from the INI (www.newton.cam.ac.uk/wmy2kposters/booklet/).

Sets of the posters themselves, which were mailed out to schools when originally produced in 2000, are now available again through the Mathematical Association. An article giving more information about the posters, and links to further reading, can be found on the Plus site at pass.maths.org.uk/issue17/features/posters/.



Million Dollar Maths

the BA
festival
of science
4-11 sept 04

The Clay Mathematics Institute's seven Millennium Problems are arguably the most fascinating and prestigious unsolved problems in mathematics today. Mathematicians Professor Louis De Branges and Dr Grigori Perelman each claim to have solved one of these problems, the Riemann Hypothesis and the Poincaré Conjecture. If they're proved right, they will be \$1 million richer, and the maths community will not have seen such a breakthrough since Andrew Wiles solved Fermat's Last Theorem. But have these problems really been solved?

Find out at the BA Festival of Science Mathematics Section
Monday 6 September, 9.30-12.30
Exeter University

Simon Singh, maths author and TV producer, will discuss Fermat's Last Theorem and introduce the unsolved Clay Millennium Problems.

Marcus du Sautoy, Oxford University, will explain why the Riemann Hypothesis is the holy grail of maths and describe the impact that its solution could have.

Keith Devlin, Stanford University, will question why maths experts think Grigori Perelman's proof of the Poincaré Conjecture is correct and why it's taking so long to prove.

There will be an open discussion following these talks for you to ask questions and air your views on the Millennium Problems. To book for Million Dollar Maths, call 020 7019 4941 or book online at www.the-ba.net by following the links to festival booking. Cost is £5 per person.

BRITISH COMBINATORIAL CONFERENCE

The 20th British Combinatorial Conference will be held at the University of Durham from 10-15 July 2005, and is being co-organized on behalf of the British Combinatorial Committee by the University of Durham and the Open University. The invited speakers at the 20th in this series of biennial conferences are B. Green (Trinity College, Cambridge), O.H. King (Newcastle), P. Östergård (Helsinki), T. Penttila (Western Australia), A.D. Scott (University College, London), O. Serra (Catalunya), P.D. Seymour (Princeton), A.D. Sokal (New York) and A. Steger (Zürich).

The conference programme will comprise invited talks and parallel sessions of contributed talks covering all aspects of combinatorics. The invited talks will be published by Cambridge University Press as part of the London Mathematical Society Lecture Note series. Arrangements are also planned for the publication, subject to refereeing, of papers corresponding to the contributed talks. Further information on the conference can be found at mcs.open.ac.uk/bcc2005/. The conference organizers are N. Martin (Durham), M.J. Grannell, T.S. Griggs, F.C. Holroyd, K.A.S. Quinn and B.S. Webb (Open University).

LÉVY PROCESSES SYMPOSIUM

The Fourth Symposium on Lévy Processes: Theory and Applications, will take place at the Manchester Institute for Mathematical Sciences at the University of Manchester, from 10-14 January 2005. The event will also include a special day in honour of the 75th birthday of S. James Taylor. The organisers are: Ron Doney (Manchester), Dave Applebaum (Nottingham Trent), Nick Bingham (Sheffield), Charles Goldie (Sussex) and Rene Schilling (Sussex).

For further information visit www.ma.man.ac.uk/4levy-conference.html or contact: rad@maths.man.ac.uk or r.schilling@sussex.ac.uk.

THE NATURE OF MATHEMATICAL PROOF

What role does proof play in the way mathematicians learn and think? On Monday 18 and Tuesday 19 October, the Royal Society will be holding a two-day Scientific Discussion Meeting to examine 'The Nature of Mathematical Proof'.

With the increasing use of computers both within mathematics and to automate mathematical reasoning, new questions have been raised about the nature of mathematical proof. This meeting will present and contrast the different viewpoints, including: experimental mathematics vs mathematical rigor, automated vs human proofs and formal vs rigorous arguments. Organised over seven sessions, speakers will include:

- Sir Michael Atiyah (Cambridge & Edinburgh)
- Professor Alan Bundy (Edinburgh)
- Professor Angus MacIntyre (Edinburgh)
- Professor Donald MacKenzie (Edinburgh)
- Sir Peter Swinnerton-Dyer (Cambridge)
- Professor Paul J. Cohen (Stanford)
- Professor Richard A. DeMillo (Georgia Institute of Technology)
- Professor Robin Milner (Cambridge)

All those interested in the subject are welcome to attend the meeting. Contact Suzi White, Science Communication Section, The Royal Society, 6-9 Carlton House Terrace, London SW1Y 5AG, or email discussion.meetings@royalsoc.ac.uk. Registrations will close if the capacity of the lecture theatre is exceeded.

TWISTOR STRING THEORY WORKSHOP

A London Mathematical Society Workshop on Twistor String Theory will be held in Oxford from 10-14 January 2005. It has been organised (by Philip Candelas, Xenia de la Ossa, Stephen Huggett, and Lionel Mason) to take stock of the rapid progress (see <http://arxiv.org/cits/hep-th/0312171>) currently

being made on twistor string theory and to encourage further cross-fertilization between string theory and twistor theory.

Twistor string theory was introduced by Witten in <http://arxiv.org/abs/hep-th/0312171> as a string theory in twistor space that makes contact with $N=4$ super Yang-Mills theory on space-time via a generalization of the Penrose-Ward transform augmented by certain instanton corrections. It promises to combine many of the most attractive features of string theory and twistor theory and has implications not only for Yang-Mills but also for (conformal) gravity.

So far the following people have agreed to participate: Atiyah, Berkovitz, Gukov, Hitchin, LeBrun, Nair, Penrose, Spradlin, Svrcek, Volovich and Witten.

The lectures will all take place in the Mathematical Institute, Oxford. There will be a small registration fee to cover things like coffee. Some financial support is available for UK participants. Those wishing to attend are asked to register by email to Sara Joliffe: joliffe@maths.ox.ac.uk, to whom all enquiries should be addressed.

Further information will be posted at www.maths.ox.ac.uk/~lmason/Tws.html when available.

MATHEMATICAL BIOLOGY CONFERENCE

Over the past 25 years Mathematical Biology has become an increasingly important research area. It is a wide-reaching subject which has seen success in many practical and applicable problems, from helping to determine government policy on conservation and infectious disease control issues to investigating the mechanisms by which tumours grow or wounds heal. The Royal Society of Edinburgh and the Royal Swedish Academy of Sciences is holding a one-day conference on 25 November to bring together experts in several different areas of mathematical biology,

to present talks and to hold open discussions on what has been achieved to date and what they would like to achieve in the future. Speakers will include:

- Brian Sleeman FRSE (Department of Applied Mathematics, School of Mathematics, University of Leeds)
- Nick A. Hill (Department of Mathematics, University of Glasgow)
- Torbjörn Fagerström (Swedish Agricultural University, Uppsala)
- Nick H. Barton FRS, FRSE (Darwin Trust Professorial Fellow, Institute of Cell Animal & Population Biology, University of Edinburgh)
- Siv Andersson (Department of Evolution, Genomics & Systematics, Uppsala University)
- Dick Hedberg (The Royal Swedish Academy of Sciences)
- Jonathan Sherratt FRSE (Department of Mathematics, Heriot-Watt University)
- Mark Chaplain FRSE (The SIMBIOS Centre, Division of Mathematics, University of Dundee)
- Philip Maini (Centre for Mathematical Biology, Mathematical Institute, Oxford)
- Eric Renshaw (Department of Statistics & Modelling Science, University of Strathclyde)
- Peter Jagers (Department of Mathematical Sciences, Chalmers University of Technology and Gothenburg University)
- Sean McKee FRSE (Department of Mathematics, University of Strathclyde)

Details of speakers still to be confirmed will be posted on the RSE website at www.royalsoced.org.uk. The conference will be held at the Kelvin Gallery, Conference Centre, University of Glasgow, Gilmorehill Campus, Glasgow. Attendance at the conference is subject to a fee of £40.00 (£30.00 for concessions: students/OAPs and Fellows - proof of status is required). The fee includes a delegate pack, refreshments and the event report. To register visit the RSE website at www.royalsoced.org.uk to download a form or contact Sue Walker, Events Officer (tel: 0131 240 5000, email: swalker@royalsoced.org.uk).

MATHEMATICAL BIOLOGY AND APPLIED ANALYSIS

An international meeting on Mathematical Biology and Applied Analysis in honour of Professor Brian Sleeman, on the occasion of his 65th birthday, will be held on Monday 11 and Tuesday 12 October at West Park Conference Centre, University of Dundee, 319 Perth Road, Dundee DD2 1NN. Invited speakers are:

- N. Bellomo (Politecnico di Torino)
- P. Browne (University of Saskatchewan)
- D. Colton (University of Delaware)
- P. Grindrod (Numbercraft)
- K. Hadeler (University of Tübingen)
- D. Jones (Emeritus, University of Dundee)
- R. Kress (University of Goettingen)
- V. Kuznetsov (University of Leeds)
- P. Maini (University of Oxford)
- D. Needham (University of Reading)
- T. Pedley (University of Cambridge)
- A. Stevens (MPI Leipzig)

Full information is available from the conference website (www.maths.dundee.ac.uk/bds65/). For other information contact: Professor M.A.J. Chaplain, Division of Mathematics, University of Dundee, Dundee DD1 4HN (chaplain@maths.dundee.ac.uk). The conference organisers gratefully acknowledge financial support from the London Mathematical Society and EPSRC through the Mathematics Biomedical Network, MBN (www.mbn.ac.uk).

MATHEMATICAL BIOLOGY NETWORK MEETING

A Mathematical Biology Networking meeting will be held on 8 September at the C18 Pope Building, University of Nottingham from 2.00 - 5.30 pm. The speakers are as follows:

- Kevin Painter (Heriot-Watt) *Modelling cell migration during embryonic growth*
- John Ward (Loughborough)

- Matt Finn (Nottingham) *Placental blood flow*
- Nigel Burroughs (Warwick)

This is the third of a series of meetings sponsored by the LMS promoting Mathematical Biology at the Universities of Loughborough, Nottingham and Warwick. The meeting is embedded within a Summer School being run by the Centre for Mathematical Medicine. For further information contact Oliver Jensen, University of Nottingham (Oliver.Jensen@nottingham.ac.uk).

CIMPA 2005

The Centre International de Mathématiques Pures et Appliquées (CIMPA) will be running the following courses during 2005:

- *Computational and mathematical physics*, Ruhuna, Sri Lanka, 20 Dec–2 Jan
 - *Security for computer systems and networks*, Bangalore, India, 25 Jan–5 Feb
 - *Riemannian and pseudo-Riemannian geometries and dynamics and applications*, El-Oued, Algeria, 26 Feb–10 Mar
 - *Arithmetic and geometry around hypergeometric functions*, Istanbul, Turkey, 13–25 Jun
 - *Mathematical tools and methods for the analysis and the regulation of fisheries*, Nouadhibou, Mauritania, 11–24 Jul
 - *Pseudo-random sequences*, Manilla, Philippines, 4–18 Jul
 - *Gröbner bases and applications*, Zanjan, Iran, 9–22 Jul
 - *Mathematical modelling for financial markets*, Irbid, Jordan, 2 weeks in Sept
 - *Quantization and harmonic analysis*, Monastir, Tunisia, 29 Aug–10 Sep
- For further information and to register for any of these events, contact CIMPA, 'Le Dubellay', 4 avenue Joachim – Bât. B, 06100 Nice, France (tel: +33 4 92 07 79 30; fax: +33 4 92 07 05 02; email: cimpa@unice.fr), or visit math-adrar.ujf-grenoble.fr/CIMPA/.

LMS PROGRAMME AND CONFERENCE FUND

Programme Committee has awarded grants to support the following conferences and meetings. These are open to all members. If you wish to attend, or would like more information, please contact the organiser.

Date/ Venue	Title	Organiser/email
11-12 Oct 2004 Dundee	Applied Analysis and Mathematical Biology: A meeting on the occasion of the 65th birthday of Professor Brian Sleeman	M.A.J. Chaplain chaplain@maths.dundee.ac.uk
13-17 Dec 2004 Leeds	Stellar Dynamos Meeting	D.W. Hughes d.w.hughes@leeds.ac.uk
21-23 Mar 2005 Edinburgh	Mathematical Neuroscience Meeting	G. Lord g.j.lord@hw.ac.uk
21-25 Jun 2005 Skye	Pure and Applied Algebraic Topology Conference	S. Theriault s.theriault@maths.abdn.ac.uk

INDUCTION COURSE FOR NEW UK MATHEMATICS LECTURERS

This induction course, organised by the Maths, Stats & OR Network – part of the Higher Education Academy – is aimed at lecturers who have started teaching mathematics in UK higher education institutions within the last three years whether new graduates or those having come from industry or from outside the UK. In the past, attendance has been recognised as contributing towards an introductory institutional programme in learning and teaching for new staff (certificated or otherwise).

Topics will include:

- Teaching and supporting learning
- Design and planning of learning activities
- Assessment and feedback
- Systems to support learning
- The computer environment
- Sharing experience

The course will take place in the School of Mathematics and Statistics in the University of Birmingham, beginning with an afternoon session on 16 September and finishing at lunchtime on 17 September: accommodation is within easy walking distance. The cost will be kept as low as possible with a subsidy from the Maths, Stats & OR Network.

If you would like to register for this event or find out further details visit mathstore.ac.uk/workshops/induction2004/, or contact the Administrator, Maths, Stats & OR Network, School of Mathematics & Statistics, The University of Birmingham, Edgbaston, Birmingham B15 2TT (tel: 0121 414 7095; email: info@mathstore.ac.uk). Bookings should be confirmed by post, with payment in advance – the cost is £75 including accommodation and an evening meal. Cheques should be made payable to 'The University of Birmingham'.

LMS SPITALFIELDS DAY

Applications of K-theory
and Cohomology

The workshop with the same title, which was held at the University of Southampton during 31 March – 2 April 2004, was designed as a follow-up to the research programme entitled *New Contexts for Stable Homotopy Theory* organised by John Greenlees, Haynes Miller, Fabien Morel and Victor Snaith at the Newton Institute during September-December 2002. Accordingly the main themes of the workshop focused on the Fields Medal winning work of Voevodsky and the related work of Suslin, Rost, Levine, Morel *et al.* which has resulted in a burst of progress on a host of famous conjectures due to Bloch-Kato, Beilinson, Birch-Swinnerton-Dyer, Coates-Sinnott, Lichtenbaum and others. Many of these applications were reported on in the subsequent workshop, which was attending by about 40 people and featured seventeen speakers from Canada, Denmark, France, Japan, Poland, Russia, Britain and the USA.

The accompanying Spitalfields Day consisted of three lectures designed to show how algebraic K-theory impinges on group cohomology, number theory and algebraic geometry. Rick Jardine outlined the history of the problem, initiated by John Milnor in the context of Lie groups, of comparing the cohomology of an algebraic group viewed on the one hand as a discrete group and on the other as a topological group with the classical topology. The case of the general linear group is particularly closely related to algebraic K-theory where such a comparison isomorphism, due originally to Suslin and Jardine independently, states that the mod p Quillen algebraic K-theory of the complex numbers and the topological K-theory coincide. Mark Levine explained the significance of Grothendieck's notion of a motive in algebraic geometry, of the search for Deligne's category of mixed motives and of the significance of the recent construction of the derived category of mixed motives by Levine, Hanamura and others, explaining how it fits in with the motivic coho-

mology of Voevodsky-Suslin-Friedlander. In the third Spitalfields Day lecture I explained, by way of illustrating algebraic K-theory at work in arithmetic, how the long conjectured non-vanishing of Kubota-Leopoldt p -adic L-functions at positive integers is equivalent to the injectivity of a natural map between algebraic K-groups. This result was originally proved by Soulé in the 1980's but I presented a simpler approach using more recent results due to Bruno Kahn, based on work of Merkurjev-Suslin.

The Spitalfields Day served very effectively both as an overview of the outstanding recent progress in algebraic K-theory and as a taste of the many resulting applications to other central subdisciplines of pure mathematics.

V.P. Snaith
University of Southampton

BOOK REVIEW

Gamma: Exploring Euler's Constant, Julian Havil, 2003, Princeton University Press, ISBN 0691 099839, 376 pp, £18.95.

Following in the footsteps of Princeton University Press's *An Imaginary Tale: The Story of $\sqrt{-1}$* by P.J. Nahin and *e: The Story of a Number* by E. Maor, Julian Havil appears to have chosen a more esoteric subject. It turns out that by considering Gamma one gains a wonderful insight into the extraordinary work of a large number of mathematicians. The mathematics involved in discovering and exploring Gamma together with a great variety of results which follow from its existence are explained clearly in detail and with great enthusiasm.

Gamma is the limit of the difference between the natural logarithm of an integer n and the harmonic series (the sum of the reciprocals of the integers) from one up to n as n tends to infinity. That the limit exists seems unlikely at first and anyone would be awestruck by the sheer computational power primarily of Euler, who discovered it, and the other eighteenth and nineteenth century mathematicians who followed in his wake.

The book starts with the birth of logarithmic

tables, their development and influence. The divergence of the harmonic series and some of its subseries, including the harmonic series of primes, are considered next. Two breathtaking proofs by Erdos are included for the delight of the reader. Over the course of the following chapters we are introduced to Gamma and become so convinced of the link between logarithms and the harmonic series that Gamma's existence seems entirely natural. In learning that, more than 250 years after its discovery, it is not known whether Gamma is rational or irrational we appreciate that no-one is yet Gamma's master.

Along the way Zeta and Gamma functions (the first appendix is the Greek alphabet!), inclusion-exclusion formulae, floor functions, Bernoulli numbers, continued fractions, Euler's totient function and many other mathematical tools and ideas are introduced and put to use. Trigonometric functions make an unlikely appearance. Many remarkable results are proved. Quite often these veer away from the subject of Gamma itself, with Number Theory providing a great source. We are given some results without proof. The significance of these is always made emphatically clear. Zeta functions and the harmonic series are inextricably linked. This gives the author licence to explore Zeta functions in greater depth and the final two chapters give an account of the Riemann Hypothesis. To this end two appendices on complex function theory and its application to the Zeta function are included. Although the Riemann Hypothesis is descended from the area of Euler's work which

took in the constant Gamma, one cannot help but feel that these two chapters belong in another book. The divergence of the harmonic series is famously slow. The divergence at the end of the book is relatively rapid. The

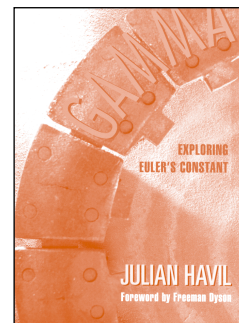
success of the author in holding the reader's full attention through some fairly tricky mathematics is possibly compromised.

The climax of the book is the two chapters which place the harmonic series and logarithms fully in the context of the real world through recent applications such as sorting and Shannon's measure of entropy for information. One of these, Benford's Law for the distribution of first digits, is a particularly fascinating account of a most surprising result. Naively one would imagine that the first digits of the numbers in, for instance, geographical or sporting data occur with roughly equal frequency but Benford's Law states otherwise.

In his foreword, Freeman Dyson states that the author's historical approach provides a 'third way' in the teaching of mathematics with enough rigour to satisfy the demands of the curriculum and enough context to give the student a way in. It certainly is an enlightening read but I suspect that it will appeal more to the initiated mathematician than to the novice. In contrast to the many recent popular accounts of mathematics there is no shying away from equations. This will appeal to those of us who thoroughly enjoyed the drama of the story in books such as Fermat's Last Theorem but yearned for more mathematical meat. This is not a book for reading in an armchair. A pen and paper are needed and there is the occasional instructive suggestion of an exercise.

The author teaches in a school and, as a teacher myself, I have little doubt that a great deal of the material from this book can be used to provide context, elaboration and, most importantly, interest to a host of topics. However, I would hesitate to advise any but the most exceptional sixth form pupils to read it through. I would fully recommend it to anyone who has completed the first year of a degree in Mathematics. The author's enthusiasm is contagious. In looking back it provides fascinating and inspiring stories. As a survey of present knowledge it is extremely scholarly. By describing open problems, it sets a challenge for the future.

Dr Ben Meisner
teaches mathematics at Oundle School



RECORDS OF PROCEEDINGS AT MEETINGS

ORDINARY MEETING

held on *Friday 18 June 2004* at University College London. At least 70 members and visitors were present for all or part of the meeting.

The meeting began at 3.30 pm, with the President, Professor F.C. KIRWAN, FRS, in the Chair.

The President invited Professor J.C. Rickard, of the University of Bristol, Senior Berwick Prize-winner for 2002, to give a lecture, postponed from last year, on *The stable module category of a finite group algebra*.

After tea, a

GENERAL MEETING

was held, with Professor Kirwan in the Chair. On a recommendation from Council it was agreed to elect Dr D.J. Collins and Professor P.T. Saunders as scrutineers in the forthcoming Council elections.

The Ordinary Meeting then resumed.

The President, on Council's behalf, proposed that Professor I.M. Singer, of MIT, be elected to Honorary Membership of the Society. This was approved by acclaim. The President read a short version of the citation, to be published in full in the *Bulletin*.

Eight people were elected to Ordinary Membership: R. Ahmad, Y.D. Barnea, Y. Chen, R.O. Jozsa, J.B. Lawrie, K. Liu, N.C. Snaith, J.R. Winkler; five people were elected to Associate Membership: M.R. Clelland, S.B. Connor, M.J. Heath, T.W.S. Hodge, G.L. Titchener; one person was elected to Reciprocity Membership: E. Bayer-Fluckiger.

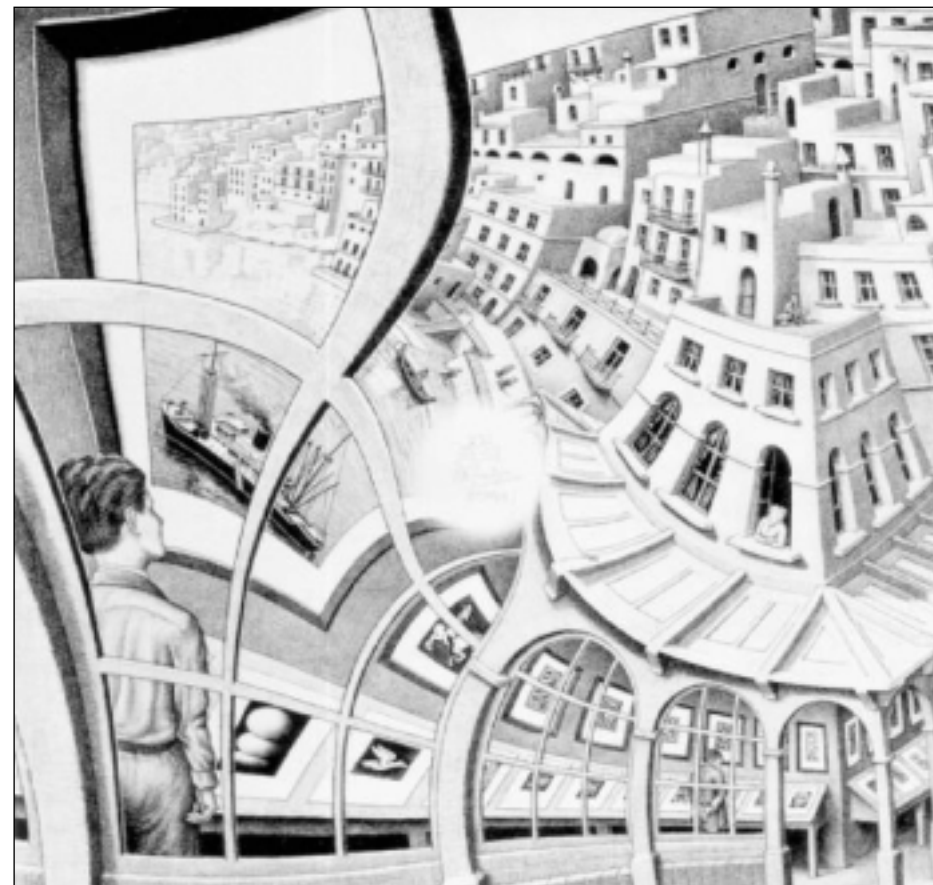
The President announced the awards of the medal and prizes for 2004:

De Morgan Medal - Professor Sir Roger Penrose OM FRS (University of Oxford);
Senior Berwick Prize - Professor Boris Zilber (University of Oxford);
Naylor Prize - Professor Richard Jozsa (University of Bristol);
the first Fröhlich Prize - Dr Ian Grojnowski (University of Cambridge);
Whitehead Prizes - Professor Mark Ainsworth FRSE (Strathclyde University),
Dr Vladimir Markovic (University of Warwick), Dr Richard Thomas (Imperial College, London), Professor Ulrike Tillmann (University of Oxford).

The President read short versions of the citations, to be published in full in the *Bulletin*.

The Hardy Lecture was given by Professor T. Tao, on *Long arithmetic progressions in the primes*.

After the meeting, a reception was held in De Morgan House, followed by dinner at the Bloomsbury Park Hotel.



The July *Newsletter* reported on the LMS Midlands Regional Meeting (p33). Dr Bart de Smit (University of Leiden), gave a captivating presentation on the mathematics behind Escher's 'Print Gallery'. Dr de Smit heads a team of mathematicians in the Netherlands working on a project to interest the general public in mathematics. The artwork in question shows a picture hanging in a print gallery which, by clever use of perspective, appears to contain the gallery itself. Escher had (unknowingly) used a conformal map to

create this effect, and by using this and the exponential map, Dr de Smit and his colleagues have been able, not only to recreate Escher's picture, but also to fill in the mysterious white circle in its centre. More information may be found on the excellent website (escherdroste.math.leidenuniv.nl) which has been visited over 300,000 times, testimony to the success of the project.

M.C. Escher's 'Ascending and Descending'
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BRITISH WOMEN IN MATHEMATICS DAY

Tuesday 28 September

The 2004 British Women in Mathematics Day will be held on Tuesday 28 September at the London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HS. Details of the programme are below. The organisers would be very grateful if all members could encourage women mathematicians, particularly students (including final year undergraduates) and those at an early stage in their career, to attend this meeting.

One aim of the day is to encourage women approaching the various interfaces – undergraduate/postgraduate, PhD/postdoc and so on – to stay in mathematics; we hope that an opportunity to see women who are active and successful in mathematics, and to meet with them informally over lunch, tea etc will have a positive effect on this problem. British Women in Mathematics are very grateful for the support given to this event by the London Mathematical Society.

Programme

- 10.30 am Registration and coffee**
- 11–1 pm Morning Session**
- 11 am Susan Howson, University of Oxford**
Elliptic curves: in theory and in practise (doughnuts and credit cards)
- 12 pm Helen Byrne, University of Nottingham**
Maths in medicine: treating tumours
- 12.30 pm Jackie Stedall, University of Oxford**
How we got to where we are: a personal and professional glimpse into the history of mathematics
- 1–2 pm Lunch**
- 2–4 pm Afternoon Session (postgraduate speakers)**
- 2 pm Jasmina Panovska, University of Oxford**
title tba
- 2.25 pm Claire Irving, University of Leicester**
Quasiperiodicity in geometry and physics
- 2.50 pm Maha Rahrouh, University of Durham**
On Bayesian zero-failure reliability demonstration
- 3.15 pm Susha Parameswaran, University of Cambridge**
A toy model for realistic string theory scenarios
- 3.40 pm Katrin Gehles, University of Glasgow**
Algebra representations - a geometric application
- 4.05 pm Apala Majumdar, University of Bristol**
Liquid crystals and harmonic maps
- 4.30 pm Tea**

Followed by an early supper at a nearby restaurant for those able to stay.

To register please contact Isabelle Robinson, Administrative Officer, at the address above (tel: 020 7291 9979, fax: 020 7291 9978, email: robinson@lms.ac.uk). The day is free for postgraduate students and £5 for all others – payable on the day. There are limited funds available to help with travel costs. While this is an occasion particularly for women active in mathematics to get together, men are certainly not excluded.

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).

SEPTEMBER 2004

- 1-3** UMTC, Birmingham University (326)
- 1-6** Pan-African Congress of Mathematics, Tunisia (308)
- 6** Million Dollar Maths, BA Festival, Exeter University (329)
- 6-8** British Logic Colloquium 2004, Leeds University (327)
- 6-11** Noncommutative spaces: their topology and measure theory, LMS/EPSC Short Course, Southampton University (327)
- 6-17** Magnetohydrodynamics of Stellar Interiors, INI, Cambridge (325)
- 7-10** Sheffield Machine Learning Workshop, Sheffield University (327)
- 8** Mathematical Biology Networking Meeting, Nottingham University (329)
- 10-14** Numerical Analysis and Applied Mathematics Conference, Greece (323)
- 13-14** British Topology Meeting, Glasgow University (325)
- 13-17** Homogenization & Shape Optimization Summer School, Portugal (325)
- 13-17** Algebraic Groups, LMS/EPSC Short Course, Birmingham University (326)
- 13-18** Stochastic Geometry CIME Summer Course, Taranto, Italy (324)
- 14-18** Boundary Integral Methods III: Theory and Applications, IMA Conference, Reading University (319)
- 16-17** Induction Course, Birmingham University (329)
- 17** LMS South West & South Wales Regional Meeting, Exeter University (329)
- 18-20** Harmonic Analysis & Number Theory Workshop, Exeter University (329)

- 20** One Day Function Theory Meeting, De Morgan House, London (326)
- 20-24** VII Congress of SIMAI, Venice, Italy (327)
- 23** Percy Alexander MacMahon's 150th Birthday Celebration Meeting, Open University, (322)
- 28** British Women in Mathematics Day, De Morgan House, London (329)

OCTOBER 2004

- 11-12** Mathematical Biology & Applied Analysis Seminar, Dundee University (329)
- 18** Euler Day, Warwick University (329)
- 18-19** Nature of Mathematical Proof Discussion Meeting, Royal Society, London (329)

NOVEMBER 2004

- 19** LMS Annual General Meeting, London
- 25** Mathematical Biology Conference, Glasgow University (329)

DECEMBER 2004

- 14-16** Mathematics in Signal Processing VI, IMA Conference, Cirencester (319)

JANUARY 2005

- 10-14** Twistor String Theory Workshop, Oxford University (329)
- 10-14** Lévy Processes Symposium, Manchester University (329)

APRIL 2005

- 4-7** Mathematics 2005, Liverpool University (329)

JULY 2005

- 10-14** Mathematical Modelling and Applications International Conference (ICTMA12), City University, London (321)
- 10-15** British Combinatorial Conference, Durham University (329)

APRIL 2006

- 10-13** BMC, Newcastle University (329)

JOHN EDENSOR LITTLEWOOD
DE MORGAN MEDALLIST
1938



Extract from the President's address: 'The De Morgan Medal is awarded to Professor J.E. Littlewood on the ground of the importance of his contributions to mathematical knowledge. Some of those who are best acquainted with his work maintain that he is the best pure mathematician that they know; the

weight and power that he shows is overwhelming.' In support of the award, the President made special mention of six pieces of work in the theory of numbers and the theory of functions as specimens of Littlewood's powers; none of them was the result of collaboration with another author.