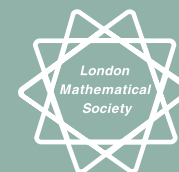


THE LONDON MATHEMATICAL SOCIETY



NEWSLETTER

No. 328 July 2004

Forthcoming Society Meetings

2004

**Friday 17 September
Exeter**

South West & South
Wales Regional
Meeting

R. Langlands
G. Henniart
[page 7]

**Friday 19 November
London**

Annual General
Meeting
D. Olive
P. Goddard
(Presidential Address)

COUNCIL DIARY

7 May 2004

Council meetings always start with the report of the President. At the May meeting of Council the first item of this was the approval of the list of LMS prizewinners, prepared by the prizes subcommittee. The list will be made public at the Society meeting in June, on the occasion of the Hardy Lecture. (See pp 3-5 for the 2004 prizewinners.)

This pleasant task was followed by discussion of the proposal (in the report of Adrian Smith's recent inquiry into Post-14 Mathematics Education) for an Advisory Committee on Mathematics Research and Industry (ACMRI). This would complement the existing Advisory Committee on Mathematics Education (ACME), by contributing high-level input on issues relating to the mathematics research base. The Council for Mathematical Sciences (CMS), which comprises the LMS, IMA and RSS, is involved in taking these proposals forward. This involvement of the CMS is certainly in line with the thinking which led the LMS to launch its new Mathematics Promotion Unit.

The report of the Treasurer reiterated its usual message that 'money is tight'. A new under-

standing of our position relative to VAT has hit us rather badly, and some caution will be necessary in this year's budget. On a more positive note, the Treasurer reported that De Morgan House's new tenants have moved in. Our previous tenants used the upstairs rooms to sublet as serviced offices, accessed from the neighbouring building. Since their replacements would have to enter the building through the main entrance, Council decided that it would seek new tenants amongst learned societies and organisations with similar aims to ours, although the rents would not be subsidised and the relationship would be strictly that of landlord and tenant. The Lighthill Institute for Mathematical Sciences is already holding its seminars at De Morgan House, and the Institution of Highway Incorporated Engineers has completely arrived.

For the report of the Publications Secretary, the Publisher presented a paper proposing a unified strategy for management of subscriptions to the Society's journals; subscriptions take various different forms, and include exchanges between the LMS and other societies. During a time when journal subscriptions are generally falling it is vital that we keep informed of the situation.

The report of the Programme Secretary contained the proposal, initiated by a request from Terence Tao and approved with enthusiasm by Council, that the title of Tao's Hardy Lecture be changed to *Long arithmetic progressions in the primes*, to enable him to present his exciting new result with Ben Green.

The Executive Secretary reported on the community meeting of 4 May at which the International Review of Mathematics had been presented. The chair, Jean-Pierre Bourguignon, had given his personal views, with responses from John O'Reilly for EPSRC and Frances Kirwan for the CMS. There had been full discussion afterwards, and a document would be put together detailing this. The IRM report was being distributed widely, not just to mathematics departments, but also to government, research councils, and other funding bodies.

The Executive Secretary's report provoked a full discussion of the International Review and of how the report might be used. It was clear that it was important to follow up this very useful review, to use it in responses to government enquiries, in discussion with EPSRC and other research councils, and to examine it closely within the LMS. It was an excellent

report, with a lot of constructive comments in it, and we needed to use it repeatedly for the benefit of British mathematics, in conjunction of course with the Smith Report.

Sarah Rees

100th BIRTHDAY

The London Mathematical Society joins Professor Henri Cartan's many friends and colleagues in the mathematical community in celebrating the occasion of his 100th birthday on 8 July 2004.

In the second half of the twentieth century there was an explosion of activity in Complex Analysis and Topology. Many of the key ideas and methods were developed in Paris, and Henri Cartan and his students at the Ecole Normale were at the forefront of this activity. As President of the International Mathematical Union and in other ways Henri Cartan was active in promoting cooperation across political borders, and in defending human rights.

The President, Frances Kirwan, has sent a letter of congratulation to Professor Cartan, who was made an Honorary Member of the Society in 1959, and is the Society's oldest member.

LMS PRIZES 2004

DE MORGAN MEDAL

PROFESSOR SIR ROGER PENROSE OM FRS of the University of Oxford is awarded the De Morgan Medal for his wide and original contributions to mathematical physics.

His deep work on General Relativity has been a major factor in our understanding of black holes. His development of Twistor Theory has produced a beautiful and productive approach to the classical equations of mathematical physics. His tilings of the plane underlie the newly discovered quasi-crystals.

SENIOR BERWICK PRIZE

PROFESSOR BORIS ZILBER of the University of Oxford is awarded the Senior Berwick Prize for his paper 'Exponential sums equations and the Schanuel conjecture', *J. London Math. Soc.* (2) 65 (2002).

In this paper Zilber took up the long-neglected subject of the model theory of the complex exponential, and revealed many fascinating possibilities. The most striking feature is that one may build a model theory around Schanuel's Conjecture, and construct existentially closed exponential fields satisfying this conjecture. The model theory is subtle, involving a model construction method of Hrushovski, but it leads to the isolation of beautiful criteria for solvability of exponential systems in the new models. In later work Zilber showed that there is an isomorphism theorem, analogous to the classical Steinitz Theorem, for a natural class of structures, the strongly existentially closed models with countable closure condition. It becomes a natural conjecture that the new structure, in power continuum, is exactly that of the classical complex exponential. This can only be true if Schanuel's Conjecture holds for the classical exponential, and if the classical exponential satisfies the Zilber Criterion for solvability of exponential systems. In this paper, Zilber relates the conjecture to uniform versions of

Schanuel's Conjecture and to a well-known conjecture on intersection with tori, a cousin of the Mordell-Lang and Manin-Mumford conjectures (which are now theorems). In addition he proves, using recent work from complex analysis, that special cases of the solvability criterion hold for systems with real exponents, and deduces a novel model theoretic stability for the theory of the complex field with real exponentiation. The results have excited most workers in model theoretic algebra, and the conjectures are one of the main challenges to the community right now.

NAYLOR PRIZE

PROFESSOR RICHARD JOZSA of the University of Bristol is awarded the Naylor Prize for his fundamental contributions to the new field of quantum information science. These encompass almost all the theoretical areas of the subject: quantum computation, communication and coding and foundational issues such the role of quantum resources in quantum information processing. Perhaps the most significant result in quantum information theory is the fact that a quantum computer can perform computational tasks exponentially faster than any classical device; this result was first shown by Jozsa, with Deutsch, in 1992. Jozsa is also co-discoverer of the cornerstone of quantum communication – 'quantum teleportation'; this protocol is now an essential tool in almost all discussions of quantum communication and led to the recognition of the key role of quantum entanglement in communication. With Schumacher and others, Jozsa developed the quantum source coding theorem, as central to quantum coding as Shannon's source coding theorem is to classical coding. Jozsa continues to make seminal contributions to the subject, an example being recent work with Linden in which he rigorously established the role of entanglement as a resource for quantum computational speed-up.

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FRÖHLICH PRIZE

The LMS awards the first Fröhlich prize to DR IAN GROJNOWSKI of DPMMS, Cambridge, in recognition of his originality and influence across a wide range of problems in representation theory and algebraic geometry.

Grojnowski's insights into geometric contexts for representation theory go back to his thesis with George Lusztig on character sheaves over homogeneous spaces. He has exploited these ideas to make breakthroughs in several completely unexpected areas, including representations of the affine Hecke algebras at roots of 1 (generalising results of Kazhdan and Lusztig), the representation theory of the symmetric groups S_n in characteristic p , the introduction (simultaneously with Nakajima) of vertex operators on the cohomology of the Hilbert schemes of finite subschemes of a complex algebraic surface, and (in joint work with Fishel and Teleman) the proof of the strong Macdonald conjecture of Hanlon and Feigin for reductive Lie algebras.

WHITEHEAD PRIZES

PROFESSOR MARK AINSWORTH FRSE of Strathclyde University is awarded a Whitehead prize for his contributions to the analysis and application of high order (hp) finite element methods to the numerical approximation of partial differential equations in continuum mechanics.

Ainsworth's contributions cover the full spectrum of numerical analysis of PDEs and his work is characterised by the application of rigorous mathematical analysis to resolve relevant, practical issues in the behaviour of high order numerical approximation of partial differential equations. His results have settled several outstanding conjectures in the field. He has also worked extensively on a posteriori error estimation culminating in the publication of a monograph co-authored with J.T. Oden (University of Texas at Austin).

DR VLADIMIR MARKOVIC of the University of Warwick is awarded a Whitehead prize for his work on infinite-dimensional Teichmüller spaces. Markovic, with colleagues, has resolved a number of outstanding open questions, starting in his thesis (1998) with a sixty-year-old problem about extremal quasi-conformal mappings of regions of infinite topological type, and including the extension to the infinite-dimensional case of H.L. Royden's famous 1971 theorem that the biholomorphic maps between Teichmüller spaces of finite type surfaces are geometric.

Since arriving at Warwick in 2000, Markovic has been an inspirational collaborator, much valued for his brilliant insight. Another outstanding conjecture which he resolved in the negative with David Epstein is the $K=2$ conjecture, following a similar answer in the equivariant case (with Marden also). Most recently he and Epstein have laid to rest Dennis Sullivan's 'Dream Problem' about quasiconformal disk homomorphisms and their quasisymmetric boundary values.

DR RICHARD THOMAS of Imperial College, London is awarded a Whitehead Prize for his contributions to algebraic and differential geometry. In the past six years, Thomas has made seminal contributions across an unusually broad range of topics. Much of his work is related to mirror symmetry and Calabi-Yau geometry, and thus has an important bearing on exciting contemporary interactions with mathematical physics. His work combines deep and original insights with sophisticated and rigorous proofs, in a wonderful synthesis of differential geometry and analysis with highly abstract algebraic geometry and homological algebra.

PROFESSOR ULRIKE TILLMANN of University of Oxford is one of the world leaders in the study of the moduli spaces of algebraic curves (or Riemann surfaces). These spaces are fundamental mathematical objects which are

central to topology, algebraic geometry and complex analysis. They also play an important role in string theory.

Tillmann discovered completely unexpected structure in the topology of the 'stable' moduli space obtained by letting the genus of the curve tend to infinity. She showed in 1997 that this space is an infinite loop space, contradicting the belief of all experts at the time that it was only a two-fold loop space.

Mumford had conjectured that the rational cohomology of the stable moduli space was a polynomial ring on a certain sequence of generators, but despite much effort there had been little progress towards a proof. Knowing that the moduli space was an infinite loop space placed very strong restrictions on its possible homotopy type, and led to Tillmann's second great advance, when in 2001 she and Madsen defined an explicit map from the moduli space into a very simple and natural infinite loop space, and gave strong computational evidence that this map was a homotopy equivalence. This new conjecture not only implies Mumford's conjecture but gives much more information, as well as a new conceptual understanding of the moduli space. In the last two years Madsen and Weiss have carried the work further and proved the conjecture.

**COUNCIL RESPONSES
& SUBMISSIONS**

The Council of the LMS has made responses and submissions to the following reports:

- (i) The Government's 10-year Plan for Science – Treasury/DTI/DfES Consultation Document 'Science and innovation: working towards a ten-year investment framework'.
- (ii) The second consultation report of the Schwartz review into Fair Admissions to Higher Education.

The Council for the Mathematical Sciences (CMS) has made a response to the following report:

(iii) Higher Education Funding Council for England (HEFCE) 2004 Consultation Paper on the Research Assessment Exercise (RAE).

Copies of responses (i) and (iii) can be found in a supplement to this month's *Newsletter*. There is access to the full version of each response on the LMS website.

**THE MATHEMATICS
PROMOTION UNIT
NEEDS YOU!**

In May we launched the Society's new Mathematics Promotion Unit at De Morgan House by appointing Jennifer Pollard to the role of Mathematics Promotion & Policy Assistant. The Unit has been established by Council in response to widespread concerns about how mathematics is perceived, and Jennifer will be working with the media to promote mathematics education and research to policy makers and the public.

The Promotion Unit will encourage media interest in mathematics by publicizing events and developments within the mathematical community and co-ordinating our responses to enquiries and reports into mathematics. It is to be a primary resource for journalists and broadcasters to find information about mathematics and talk to mathematicians. But in order to achieve this, we need your help.

To allow media access to the mathematical community the Promotion Unit is setting up a database of mathematicians who would be happy to act as media contacts. We therefore need the help of a wide range of mathematical experts who would be prepared to talk to the media about their specialist subjects or mathematics in general.

As a media contact, you may be approached by journalists or broadcasters through the Mathematics Promotion Unit. You will not be contacted directly or out-of-the-blue by the media – all contact will be mediated through the Unit. Nor will you be expected to talk about subjects that you do not wish to or commit yourself

to regular contact. You will be expected to put across your knowledge of and feelings for mathematics to a wider audience and to act as an ambassador for mathematics and the mathematical community (and the LMS).

If you are interested in becoming a media contact for the LMS or would like any further information, please contact Jennifer Pollard (tel: 020 7927 0803; email: pollard@lms.ac.uk).

Jennifer Pollard
Mathematics Promotion & Policy Assistant

NEWS FROM THE WOMEN IN MATHEMATICS COMMITTEE

The committee has introduced two new schemes, both with the aim of reducing some obstacles which may inhibit, or even halt, mathematical activity, particularly of women. A brief description of each scheme is below, while further details can be found on the Society's website (www.lms.ac.uk/activities/women_maths_com/index.html).

The first of these are fellowships named after Grace Chisholm Young; these fellowships aim to provide some support when a mathematical career is interrupted by family responsibilities, relocation of partner, or other similar circumstance, making possible some continuous mathematical activity and so enabling the fellow to be in a position to apply for posts when circumstances allow. The Fellowship will give an endorsement of the holder's status as a mathematician, so that the break in formal employment should not prevent them from resuming a career as a mathematician at a later stage. A fellow will be based in a specific mathematics department in a University or Research Institute in the UK; the host institute would receive a contribution of £500 from the LMS or other sponsor, and be expected to provide an email address, use of library facilities and IT facilities for correspondence and access to research literature.

The second scheme recognises that parents are sometimes prevented from attending conferences and meetings and making research visits because, although their own travel and living expenses are funded, there is no provision for the extra costs incurred in looking after children either at home or (when necessary) at the place visited. It is the LMS view that institutions should make provision for childcare costs but, while this is not largely the case, the Society is willing to make a supplementary grant as a contribution to the costs. Candidates should first approach the institution/conference organisers to see if any arrangements are in place, and contact other bodies for support, before applying for the LMS grants.

Both these schemes are initially to be funded on a pilot basis by the London Mathematical Society, assisted by an anonymous donation specifically for the Grace Chisholm Young Fellowships. It is hoped that in due course other sources of funding will become available.

As well as bearing these possibilities in mind for personal use, members are asked to bring these schemes to the attention of those who might benefit from them. It should also be remembered that the LMS has sponsored a Daphne Jackson Fellowship which is designed to enable the return to mathematical research after a career break, see www.daphnejackson.org/.

Alice Rogers
Chair, Women in Mathematics Committee

FELLOWS OF THE ROYAL SOCIETY

Amongst those elected to Fellowship of the Royal Society in May 2004 were: Professor Samson Abramsky (University of Oxford), Professor Julian Besag (University of Washington), Professor David Epstein (University of Warwick) and Professor David Preiss (University College London).

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 **31 August**.

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. 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).

FELIX KLEIN AND HANS FREUDENTHAL 2003 AWARDS

The International Commission on Mathematical Instruction (ICMI) has, for the first time in its history, established prizes recognizing outstanding achievement in mathematics education research. The Felix Klein Medal, named after the first president of ICMI (1908-1920), honours a lifetime achievement. The Hans Freudenthal Medal, named after the eighth president of ICMI (1967-1970), recognizes a major cumulative program of research. These awards are awarded in each odd numbered year. Presentation of the medals, and invited addresses of the medalists, will occur at International Congress on Mathematical Education (ICME) in Copenhagen on 4 November 2004.

The Felix Klein Medal for 2003 is awarded to Guy Brousseau, Professor Emeritus of the University Institute for Teacher Education of Aquitaine in Bordeaux, for his lifetime development of the theory of didactic situations, and its applications to the teaching and learning of mathematics.

The Hans Freudenthal Medal for 2003 is awarded to Celia Hoyles, Professor at the Institute of Education of the University of London, for her seminal research on instructional uses of technology in mathematics education.

GLOBAL SECURITY CONFERENCE

Royal Society Funding

With a view to encourage younger scientists to put their scientific research into a broader context, the Royal Society is offering to fund two young scientists to attend the XVI Amaldi Conference on Global Security, to be held in Trieste, Italy, from 18-20 November.

Funding will be offered to two excellent post doctorate scientists under the age of

forty who can demonstrate a particular interest in the scientific aspects of international security. It will cover travel expenses, accommodation and subsistence. These individuals will be part of the UK delegation at the meeting and will be required to submit a short report of the conference to the Royal Society upon their return.

The Amaldi Conferences bring together scientists representing different national academies to discuss problems of global security, and this particular meeting will cover four topics:

- the problem of inputting independent scientific research into governmental security policy
- nuclear weapons
- biological weapons and biodefence research
- dual-use technologies in information warfare

The history of the meetings, along with presentations and topics discussed at previous Amaldi Conferences, can be found at www.lincei.it/rapporti/amaldi. For further information contact Kate O'Shea at the Royal Society, Science Advice Section (tel: 020 7451 2674; email: kate.oshea@royalsoc.ac.uk). The application deadline is **2 August 2004**.

NESTA DREAM TIME FELLOWSHIPS

The National Endowment for Science, Technology & the Arts (NESTA) is offering up to 16 fellowships under its Dream Time Programme. The awards, of up to £40,000 each, are offered to exceptional scientists, engineers and artists, to provide time and funding to innovate and explore ideas away from the demands of professional life. The awards can be used on a full or part-time basis, in tandem with professional careers or temporarily away from the constraints of employment. For further information about the Fellowships, visit the website www.nesta.org.uk/dreamtime.

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BATH CENTRE FOR COMPLEX SYSTEMS

The third grant in the EPSRC multidisciplinary critical mass in mathematics initiative has been awarded to Professor Chris Budd at the University of Bath, to establish the Bath Centre for Complex Systems. The £1 million grant will enable the centre to exploit the increasingly blurred distinction between mathematics, statistics, and computation, to analyse large complex systems such as those found in biology and engineering.

This is a major coup for the researchers involved, as only one grant is made under this initiative each year. The scheme builds on existing multidisciplinary research activity in mathematics and provides funding to develop these into centres of critical mass, which connect mathematics to other disciplines in the remit of the EPSRC.

Professor Budd is currently a member of the LMS Council and Education Committee.

WOLFSON RESEARCH MERIT AWARD

Professor Björn Sandstede, Professor in Mathematics in the Department of Mathematics & Statistics, University of Surrey, has been awarded a prestigious five-year Royal Society Wolfson Research Merit Award for research in *Coherent structures in science and biology: dynamics, stability and interaction*. Professor Sandstede obtained his PhD (with distinction) from the University of Stuttgart in 1993. After research positions at Berlin and at Brown University, he moved to Ohio State University in 1998. Professor Sandstede is internationally recognised as one of the leading researchers in the area of dynamical systems analysis of nonlinear

partial differential equations associated with pattern formation. His work includes a novel combination of pure mathematics, numerical analysis, dynamical systems methods, PDE theory and physical insight. He is also involved in interdisciplinary activity in the areas of mathematical biology, oceanography, laser dynamics, optics and chemistry.

CECIL KING TRAVEL SCHOLARSHIP

The 2004 Cecil King Travel Scholarship has been awarded to Anna Mills, a PhD student at the University of Manchester. The London Mathematical Society makes the award of up to £5000 annually to a

young mathematician of outstanding promise, to support a period of study or research abroad for a typical period of three months. Anna will use the Scholarship to fund a trip to Massey University, New Zealand, where she will study the mathematics of image registration, with particular application to medical image analysis, with Dr Stephen Marsland. She hopes to be able to investigate the mathematical basis and suitability of similarity measures within objective functions used for optimization in image.



Anna Mills

EPSRC POSTDOCTORAL FELLOWSHIPS IN MATHEMATICAL SCIENCES

The Engineering and Physical Sciences Research Council is offering up to seven fellowships to assist talented young researchers establish an independent research career. The scheme is open to mathematicians, statisticians and operational researchers who are final year PhDs or have recently completed PhDs.

The award is for three years, with salary provided and £6,000 p.a. available for travel/consumables/computing. Fellowships are to be held at UK universities or similar institutes.

To be eligible for the awards, candidates must

- have a maximum of 3 years' postdoctoral experience at the date of application
- not be in a permanent academic position
- pursue research which lies within the remit of the EPSRC Mathematical Sciences Programme

For further information contact Dr Caroline Batchelor, EPSRC, Polarix House, North Star Avenue, Swindon SN2 1ET (tel: 01793 444 458; email: caroline.batchelor@epsrc.ac.uk) or visit www.epsrc.ac.uk. The closing date for applications is **24 September 2004**.

OPEN CALL FOR TWO NEW ACME MEMBERS

The Advisory Committee on Mathematics Education has issued the call for two new members, reported below. The Society was involved in the initial discussions leading to the establishment of ACME, and remains firmly in support of it and its work. Members are encouraged to help ACME find good applicants for these positions.

The Advisory Committee on Mathematics Education (ACME), established in 2002 by the Royal Society and the Joint Mathematical

Council of the UK, with support from the Gatsby Charitable Foundation, provides a two-way channel between the mathematics community and the Government and its agencies on mathematics education issues in English schools and colleges. Since its formation the Committee has worked both proactively and reactively, producing policy reports and responding to policy initiatives in key areas. For further information about ACME and its work please see www.acme-uk.org.

ACME collectively aims to have expertise in mathematics and mathematics education at all levels from primary up to the start of higher education, including the mathematical needs of employment, and in the education of teachers of mathematics. Insofar as is feasible for a small group, it seeks to have a balanced representation across phase, region, gender and ethnic background.

ACME is now seeking two new teacher members, one from the Primary sector and one from the Secondary sector. Members are currently expected to give 10% of their time to ACME work, and their schools will be reimbursed for the relevant proportion of their salary costs via the Royal Society. Travel and subsistence expenses incurred on ACME business (including for its formal meetings, usually held monthly in London) are reimbursed directly to members.

Recognising the need to accommodate school time-tabling arrangements, ACME will be flexible about start dates; the new members may start serving on ACME at any convenient time between January and September 2005 and applicants should indicate their preferred start date. Short-listed candidates for these two positions are expected to have extensive experience of teaching mathematics in maintained schools in England.

Members will be selected considering the overall balance of the committee, and on the basis of a range of criteria including: ability to commit at least 10% of their time to ACME

work; experience of mathematics teaching in the maintained sector; involvement in established networks (such as membership of professional bodies) to allow wide consultation and dissemination; track record in writing, leading projects, and communicating to diverse audiences; open-mindedness and the ability to work as part of a co-operative team. The members of ACME serve as individuals and not as representatives of any organisation or interest group.

Applicants should provide a two-page CV and explain in no more than 500 words what they feel they will bring to ACME and how they will manage to give the time required for ACME work (currently a minimum of 25 days per year including 12 committee meetings in London). They should provide a signed reference from their head teacher supporting their application to join ACME.

Applications must be received by **Friday 17 September 2004**. Please send eight copies of application papers to ACME, The Royal Society, 6-9 Carlton House Terrace, London SW1Y 5AG.

EPSRC MATHEMATICAL SCIENCES PROGRAMME STRATEGIC ADVISORY TEAM

The Maths SAT met for the sixth time on 12 May at the DeVere Hotel, Swindon. This meeting was held in conjunction with the 2004 SATs conference, which brought together members of all of the SATs to discuss EPSRC's post-graduate training strategy and setting the balance between research and training.

There were only two items on the agenda for the Mathematical Sciences SAT, but both of them stimulated a great deal of discussion. First, the SAT turned its attention to Programme Assurance. The main purpose of programme assurance is to provide an update on the progress of the Programme in achiev-

ing its objectives and to raise with TOP and UP any issues which are affecting the Programme. At the March meeting, the SAT focused on the individual sub-programmes of pure mathematics, applied mathematics, statistics and operational research. At this meeting, the SAT considered the Programme level review. Its aim is to provide a primarily factual view of the Programme and how it is evolving. It should show how effectively the Programme is meeting its objectives and contributing to the delivery of EPSRC's strategic objectives in terms of high quality research, developing talented people, knowledge transfer and public engagement. The SAT looked at a draft copy of the review and the data to support it and made a number of helpful suggestions for revisions which would strengthen and clarify the review. The Programme Review documents will all be available on the EPSRC website later in the autumn.

During Programme Assurance it has become clear that some of our data relating to studentships is inaccurate in terms of the research topics that students are studying. I would encourage all departments to ensure that their studentship returns to EPSRC are properly coded so that we are able to make informed judgements about the numbers of students studying for PhDs in the different branches of the mathematical sciences. Currently our data, based on returns from departments, show a large number of students studying Mathematical Analysis and we know that this is not, in fact, the real picture.

The SAT then moved on to a discussion of the International Review of Mathematics. This was the second time that the SAT had discussed the IRM but the first since the community meeting of 4 May. The SAT highlighted a number of key points coming out from the review and the subsequent debate in the community:

- PhD student training - although the Doctoral Training Accounts allow for the

possibility of a four-year PhD, universities are not prepared to cut student numbers to provide this. Neither does a longer PhD necessarily lead to a broader education. Programmes of taught first years, perhaps delivered via regional clusters, were suggested as a possible improvement on the current situation. (In fact, universities could come together now to deliver these from within their existing Doctoral Training Accounts.)

- Mid-career researchers - the need for people to have some time free of administrative responsibilities was endorsed. The new Springboard Fellowships may provide opportunities for mid-career researchers but within some constraints.
- Statistics - the problems in statistics have been pressing for a while but it is still not clear how they would best be addressed. Some of the factors quoted as being a problem in the peer review of statistics proposals also apply to other multidisciplinary areas of research. An initiative such as the one suggested in the International Review could be one way forward.

It will be important to identify the factors which will really build capacity within the UK academic statistics community and to work with universities and the Royal Statistical Society to address the key problem of the unbalanced age distribution in this discipline.

At the main SATs conference, John O'Reilly detailed his plans for developing Research Leadership Capacity in areas of strategic importance, where the research activity is unduly fragmented and there may be demographic issues. Such an intervention would be aimed at breaking the link between declining undergraduate student numbers and the numbers of researchers at more senior levels in these disciplines. EPSRC will provide funds to nucleate a new research group of significant scale including a number of research lectureships, postdoctoral research assistants and PhD students. Statistics and the interface

between Computer Science and Mathematics are two areas that have been identified in the International Review of Mathematics that could possibly benefit from such an intervention.

The rest of the conference concentrated on the strategy for postgraduate training covering all the EPSRC funding aimed specifically at postgraduate level including Doctoral Training Accounts, Collaborative Training Accounts, Industrial CASE studentships and the UK GRAD programme. The SATs spent some time finding out about EPSRC's current research and training activities and providing input to the postgraduate training strategy. The balance of funding between research and training is historical dating back to SERC. There have been some adjustments by individual programmes, but, in general, the two strands of support have been considered separately during our planning processes. The 2005 business plans should bring these two activities together for the first time and the SATs were asked to help identify the criteria to decide on the balance of funding between research and training.

As always, the Mathematical Sciences Programme would be happy to receive feedback from the wider mathematical sciences community on any of the issues that were discussed by the SAT. I would be particularly interested in your views on the balance between the research and training budget in the Programme and your experiences of the Doctoral Training Account, both positive and negative. I cannot promise to respond individually to all the points raised but will take them into account as we go forward with the next business plan. Comments relating specifically to the International Review of Mathematics should be sent to irm@lms.ac.uk so that they can be taken into account by all of the parties involved in the review.

Dr Annette Bramley
EPSRC Programme Manager
Mathematical Sciences

REBUILDING IRAQI UNIVERSITY LIBRARIES

The Al Sharaka Program for Higher Education in Iraq is a unique consortium of Iraqi and Oklahoma universities dedicated to the rebuilding of Iraqi higher education. Based at the University of Oklahoma, it is funded by a United States Agency for International Development (USAID) grant. Al Sharaka partners are:

- Oklahoma Higher Education Partners (OHEP):
- University of Oklahoma
- Oklahoma State University
- Langston University
- Cameron University
- Iraq University Partners (IUP):
- University of Salahaddin
- University of Babylon
- University of Technology – Baghdad
- Al-Anbar University
- Basra University

One of the goals of Al Sharaka is to assist in the restoration of its partnering Iraqi university libraries which, after two decades of sanctions, active conflict, and looting, are severely depleted and outdated. As such, Al Sharaka is seeking the donation of books which are significant to, and representative of, academic disciplines.

Due to the strict USAID donation guidelines, only books that would update Iraqi library collections can be accepted by the campaign: consequently, Al Sharaka can only accept books published since 1996. Naturally, certain titles, for instance literature or philosophy, may be considered 'timeless classics' and are therefore an appropriate donation. Subscriptions to electronic journals are also a suitable donation, and many such resources have already been arranged for the Iraqi libraries. While the campaign is calling for donations of new books, good condition second-hand texts can also be donated.

- Other donation guidelines:
- Books, textbooks, instructor's manuals, ref-

- erence books, and instructional CDs
- Books appropriate for undergraduate and graduate level students
- English is the language of instruction in Iraq
- How to donate:
- After gathering together your donation, visit the following website to print the Books Beyond Borders Donation Form: <http://students.ou.edu/W/Erin.A.Weathers-1/Docs/Donation.doc>
- Complete the donation form and slip it inside the front cover of your donation (one form per entire donation)
- Mail your donation (media rate will be the least expensive) to: Al Sharaka, Attn: Erin Taylor Weathers, 1700 Asp Avenue, Box 37, University of Oklahoma, Norman, OK 73072-6400, USA.

Your donation will be catalogued and reviewed to determine which Iraqi campus library would most benefit from it. Then the Al Sharaka Program arranges and pays for secured shipping to Iraq which will commence this summer. Books are accepted through to **mid-July 2004**. Each donor will receive a commendation certificate based on the information completed on the Donation Form. A tax id can be provided after your donation has been received for deduction recording purposes.

IMU LOGO COMPETITION

The International Mathematical Union (IMU) is sponsoring a competition for a logo for IMU.

- Guidelines:
- All submissions must be made electronically to imu@ias.edu by **20 February 2005**. No mail submissions will be considered
 - All submissions must be original artwork, and the design chosen becomes the property of IMU to be used and adapted for IMU publications, website, and merchandise and in any other manner determined by IMU.
 - IMU will make the final decision, which cannot be appealed.

- The creator of the chosen design will receive an expense-paid trip to the International Congress of Mathematicians 2006 in Madrid, Spain, 22-30 August 2006. The award will consist of one economy airfare, local accommodations, including hotel and food, and congress registration, up to a total reimbursement not to exceed US \$3,000. The recipient will be responsible for all reservations. Please address any inquiries regarding this competition to: imu@ias.edu.

JOHN HAMMERSLEY

Professor John Hammersley died on 2 May 2004, aged 84. He was born in Helensburgh and educated at Sedburgh and, as a scholar, at Emmanuel College, Cambridge. After military service, he joined the department of design and analysis of scientific experiment in Oxford. He taught for Trinity College until 1955 when he moved to the Atomic Research Establishment at Harwell. In 1959 he returned to Oxford, to Trinity and to the Institute of Economics and Statistics. He was a mathematical statistician of great intellectual rigour. Through his influence, percolation is now a huge area of research in both mathematical probability and statistical physics. He visited many parts of the country lecturing on the enfeeblement of mathematical skills by modern mathematics and by 'similar soft intellectual trash in schools and universities'. Dr Hammersley was awarded the Society's Polya Prize in 1997.

SIEGRIED THOMEIER

Professor Siegfried Thomeier, who was elected a reciprocity member of the London Mathematical Society on 17 November 1996, died on 12 March 2004, aged 67. He was born in the Sudetenland region of Czechoslovakia, and studied as a mathematician at the University of Frankfurt, receiving his doctoral

degree (Dr Phil Nat) in Algebraic Topology in 1965. He was an Associate Professor at the University of Aarhus, Denmark from 1965-1968. He then moved to the Memorial University of Newfoundland, Canada, where he remained until his retirement in 1996. His mathematical research was on Whitehead products, a topic related to investigation of the deep and challenging problem of computation of homotopy groups of spheres.

VISIT OF DR Y. ZHANG

Dr Yong Zhang (University of Manitoba) will be visiting the University of Nottingham from 13-19 September, the University of Newcastle upon Tyne from 20 September - 2 October and the University of Leeds from 3-16 October. His visit is supported by an LMS Scheme 2 grant. Dr Yong Zhang's research areas are Banach algebras, algebras of operators on Banach spaces, amenability and weak amenability of Banach algebras. During his visit he will give talks at the above Universities. Further details can be obtained from Dr Zinaida Lykova (Z.A.Lykova@ncl.ac.uk).

VISIT OF PROFESSOR H. KIM

Professor Henri Kim (University of Toronto) will be visiting the University of Nottingham from 24-27 August. Professor Kim is one of the most active researchers in Langlands correspondence. His visit is supported by EPSRC grant 'Zeta function of arithmetic schemes'.

- He will deliver three 90 minute lectures on:
- Langlands functoriality conjecture
 - Automorphic L-functions and Langlands-Shahidi method
 - Functoriality of symmetric cube and fourth of cuspidal representations on $GL(2)$

For more information visit the higher arithmetic seminar web homepage www.maths.nottingham.ac.uk/personal/ibf/har.html or contact Professor Ivan Fesenko (Ivan.Fesenko@nottingham.ac.uk).

CAHIT ARF LECTURE

The fourth Cahit Arf Lecture will be given by Professor Robert P. Langlands (IAS, Princeton) on *Conformal field theory and the mathematician*. The Lecture will take place on 4 November at the Department of Mathematics, Middle East Technical University, Ankara, Turkey. For further information contact Professor Safak Alpay (safak@metu.edu.tr).

ALGEBRAIC METHODOLOGY AND SOFTWARE TECHNOLOGY

The 10th international conference on Algebraic Methodology and Software Technology (AMAST'2004) will take place at the University of Stirling from 12-16 July. The goal of the meeting is to promote research into the development of a firm mathematical basis for computer software technology. The conference is supported by the EPSRC, BCS-FACS, the LMS and the EMS. Subsidized places for UK-based students are available. Further details, including how to register, may be found at www.cs.stir.ac.uk/events/amast2004/.

MATHEMATICAL ANALYSIS COURSE IN ANDALUCIA

The second international course of Mathematical Analysis in Andalucia will be held in Granada, Spain, from 20-24 September. These courses are held biennially in Andalucia, the first being in Cadiz in 2002.

The aim of the course is to give an extensive overview of new directions and advances in Mathematical Analysis. Researchers are therefore invited to examine topics that seem promising as guidelines for current and future research in this area of mathematics. Leading researchers in the field will provide us with a variety of topics and open prob-

lems, and present tools and techniques that have been helpful in similar situations. To this goal, we offer both seminars and one-hour talks. While the one-hour talks are intended to provide an overview of a variety of current topics, the seminars will extend over several days and will therefore allow in-depth discussion of certain specific subjects. Moreover, all participants at the meeting will have the opportunity to present briefly, new results from their own research.

The invited speakers are:

- Richard M. Aron (Kent State University, USA)
- Fernando Bombal (Universidad Complutense de Madrid, Spain)
- Jose Bonet (Universidad Politecnica de Valencia, Spain).
- Javier Duoandikoetxea (Universidad del Pais Vasco, Spain)
- Gilles Godefroy (University Paris VI, France)
- William B. Johnson (Texas A&M University, USA)
- Nigel J. Kalton (University of Missouri, USA)
- Michael Neumann (Mississippi State University, USA)
- Lawrence Narici (St. John's University, New York, USA)
- Kristian Seip (Norwegian Univ. of Sciences and Technology, Norway)
- Manuel Valdivia (Universidad de Valencia, Spain)
- Joan Verdera (Universitat Autonoma de Barcelona, Spain)
- Felipe Zo (Universidad Nacional de San Luis, Argentina)

The registration fee, before 15 July, is €50 for students and €100 for all other participants. After 15 July, the fee will be €100 for students and €120 for other participants. A gala dinner is included in this fee. To register, complete the on-line registration form on the website www.ugr.es/local/amandal, or contact Victoria Velasco (Coordinator), Depto. de Analisis Matematico, Facultad de Ciencias, Universidad de Granada, 18071-Granada, Spain (email: amandal@ugr.es).

BOUNDARY INTEGRAL METHODS CONFERENCE

The 3rd IMA international conference on Boundary Integral Methods, Theory and Applications will be held at the University of Reading from 14-18 September. The invited speakers are:

- Peter Bettess (University of Durham, UK)
- Marc Bonnet (Ecole Polytechnique, France)
- Oscar Bruno (California Institute of Technology, USA)
- Wolfgang Dahmen (RWTH Aachen, Germany)
- Vladimir Maz'ya (Linkping University, Sweden)
- William McLean (University of New South Wales, Australia)
- Eric Michielssen (University of Illinois at Urbana-Champaign, USA)
- David Natroshvili (Georgian Technical University, Tbilisi, Georgia)
- Jean-Claude Nedelec (Ecole Polytechnique, France)
- Roland Potthast (University of Göttingen, Germany)
- Christoph Schwab (ETH, Zürich)
- Jean-Marc Vanden-Broeck (University of East Anglia, UK)
- Wolfgang Wendland (University of Stuttgart, Germany).

The conference is supported by an LMS conference grant. This will support the travel and subsistence expenses of two delegates from the former Soviet Union (fSU) and will provide a number of LMS Bursaries towards travel and subsistence costs for UK Research Students. The fSU delegates are Professor N. Kuznetsov of the Laboratory for Mathematical Modelling of Wave Phenomena in St Petersburg and Professor R. Duduchava of the A. Razmadze Mathematical Institute, Tbilisi, Georgia. For further information visit the website (www.ima.org.uk/mathematics/boundary.htm).

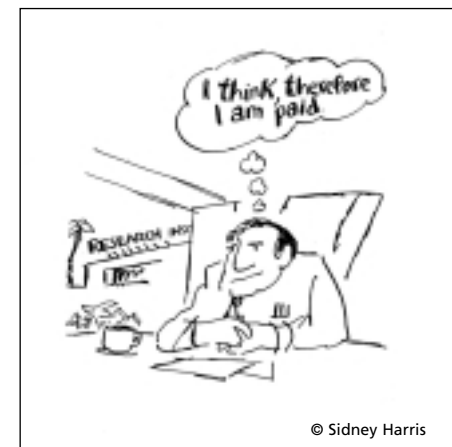
MATHEMATICAL SCIENCES RESEARCH INSTITUTE

The Mathematical Sciences Research Institute (MSRI) at Berkeley, USA, exists to further mathematical research through broadly based programs in the mathematical sciences and closely related activities.

From its beginning in 1982 the Institute has been primarily funded by the National Science Foundation with additional support from other government agencies, private foundations, and academic and corporate sponsors. Now more than 1700 mathematical scientists visit MSRI each year, many for substantial periods.

Forthcoming programmes:

- *Knot theory and 3-manifolds*, 7-20 July, Organisers: S. Boyer (UQAM), R. Fenn (Sussex), D. Rolfsen (Chair) (UBC), D. Sjerve (UBC).
- *Hyperplane arrangements and applications*, 2-13 August, Organisers: M. Falk, A. Suciu, H. Terao, S. Yuzvinsky.
- *Hyperplane arrangements and applications*, 16 August – 17 December, Organisers: M. Falk, P. Hanlon, T. Kohno, P. Orlik, A. Varchenko, S. Yuzvinsky (Chair).
- *Hyperplane arrangements and applications*, 23-27 August, Organisers: M. Falk, P. Orlik (Chair), A. Suciu, H. Terao, S. Yuzvinsky.



- *Modern mathematics*, 18-19 September, Organisers: D. Ellis (SFSU), D. Meredith (SFSU), H. Rossi (MSRI).
- *Recent progress in dynamics*, 27 September - 1 October, Organisers: M. Brin, B. Hasselblatt (Chair), G. Margulis, Y. Pesin, P. Sarnak, K. Schmidt, R. Spatzier, R. Zimmer.
- *Topology of arrangements and applications*, 4-8 October, Organisers: D.C. Cohen, M. Falk (Chair), P. Orlik, A. Suciu, H. Terao, S. Yuzvinsky.
- *Combinatorial aspects of hyperplane arrangements*, 1-5 November, Organisers: P. Hanlon, P. Orlik, S. Varchenko.
- *Mathematical and statistical methods for visualization and analysis of high dimensional data*, 13-17 December, Organisers: G. Carlsson.

For further information on any of these events, visit the website www.msri.org, where many of the lectures given at the Institute are also available via streaming video.

NATIONAL e-SCIENCE CENTRE WORKSHOP

Networks for Non-Networkers (NFNN) is a free to attend, two day workshop, taking place on 13-14 July 2004 at University College London. The workshop is designed for people working at the technical level, in high-bandwidth dependent science, and although it is a general workshop, NFNN will be of particular interest to those working with high-bandwidth Grid projects.

Through a series of presentations from experts in their field, NFNN will show how end-users can obtain higher network performance for their applications. The workshop is not intended as a definitive guide to networking; however, it will equip participants with a set of starting points and practical knowledge for troubleshooting networking problems that may arise in their day-to-day work. For further information visit the website <http://grid.ucl.ac.uk/NFNN.html>.

THE UNIVERSITY OF SHEFFIELD

APPLIED PROBABILITY TRUST

JOURNALS PRODUCTION EDITOR

The Trust needs a Journals Production Editor to coordinate its international mathematics publishing. Applicants should have experience of working with research-level mathematical texts, and be interested in the high-quality communication of mathematics and its applications via print and electronic media. At least a first degree in mathematics or a related subject, and familiarity with LaTeX in a Windows environment are required.

Further training will be given in technical aspects of the post. This post is available from September 2004.

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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. Any postgraduate students wishing to talk in the afternoon session should contact Gwyneth Stallard (G.M.Stallard@open.ac.uk).

Programme

10:30–11 am	Registration and coffee
11–1 pm	Morning Session
11:00 am	TBA <i>Susan Howard, University of Oxford</i>
12:00 pm	Maths in medicine: treating tumors <i>Helen Byrne, University of Nottingham</i>
12:30 pm	How we got where we are: a personal and professional glimpse into the history of mathematics <i>Jackie Stedall, University of Oxford</i>
1–2 pm	Lunch
2–4 pm	Afternoon Session Postgraduate speakers – TBA
4 pm	Tea

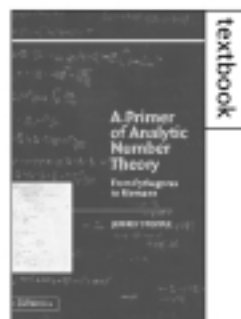
Followed by an early supper at a nearby restaurant for those able to stay.

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.

To register please contact Isabelle Robinson, Administrative Officer, at the Society (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. While this is an occasion particularly for women active in mathematics to get together, men are certainly not excluded.

CAMBRIDGE

...For the Books That Count



A Primer of Analytic Number Theory From Pythagoras to Riemann Jeffrey Stopple

An undergraduate-level introduction whose only prerequisite is a standard calculus course.

£65.00 | HB | 0 521 81309 3 | 398pp
£22.99 | PB | 0 521 01253 8

Permutation Group Algorithms Ákos Seress

Theory of permutation group algorithms for graduates and above. Exercises and hints for implementation throughout.

Cambridge Tracts in Mathematics, 152
£47.50 | HB | 0 521 66103 X | 274pp

MAD ABOUT MATHS? Visit our recreational maths web site at <http://www.cambridge.org/mathematics/recreation>

Textbook The Geometry of Physics An Introduction Second edition Theodore Frankel

Introduces, in a geometrical way, the mathematics needed for a deeper understanding of both classical and modern physics.

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£30.00 | PB | 0 521 53927 7

Surveys in Combinatorics 2003 Edited by C. D. Wensley

Survey papers from British Combinatorial Conference. Researchers and graduates will find much to inspire future work.

London Mathematical Society Lecture Note Series, 307
£35.00 | PB | 0 521 54012 7 | 378pp
LMS Member Price £26.25

Graduate Textbook Computational Algebraic Geometry Hal Schenck

Investigates interplay between algebra and geometry. Covers: homological algebra, algebraic combinatorics, algebraic topology, and algebraic geometry.

London Mathematical Society Student Texts, 58
£50.00 | HB | 0 521 82964 X | 208pp
LMS Member Price £37.50
£18.99 | PB | 0 521 53650 2
LMS Member Price £14.25

An Introduction to Invariants and Moduli Shigeru Mukai

Translated by W. M. Oxbury
This title consists of the first two volumes of Mukai's series on moduli theory.

Cambridge Studies in Advanced Mathematics, 81
£65.00 | HB | 0 521 80906 1 | 524pp

Graduate Textbook Frobenius Algebras and 2D Topological Quantum Field Theories Joachim Kock

Connects topology and algebra using modern techniques. Numerous exercises and examples, ideal for course use.

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LMS Member Price £45.00
£22.99 | PB | 0 521 54031 3
LMS Member Price £17.25

Number Theory and Algebraic Geometry

Edited by Miles Reid and Alexei Skorobogatov
This volume honours Sir Peter Swinnerton-Dyer's mathematical career, spanning more than 60 years of amazing creativity in number theory and algebraic geometry.

London Mathematical Society Lecture Note Series, 303
£35.00 | PB | 0 521 54518 8 | 306pp
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LMS PROGRAMME AND CONFERENCE FUND

The Programme and Conference Fund is used to give financial support for mathematical research in the UK. The fund is administered by the LMS Programme Committee, which distributes as grants some of the funds that the Society receives from its investments and publishing activities. This is one of the mechanisms through which the Society achieves its central purpose, namely to 'promote and extend mathematical knowledge'. The Society operates as a charity and does not receive any public funding. Thus Programme Committee has different opportunities and works within a different regulatory framework from other funding bodies, such as the EPSRC. Grants are made under six schemes which are described on the LMS website (www.lms.ac.uk/activities/prog_com/index.html).

How to Apply

For Schemes 1-5 application forms may be obtained from the Society's Office or may be downloaded as rich text files from the LMS website (www.lms.ac.uk/activities/prog_com/index.html). For Scheme 6 applications should be made by letter. All applications should be sent in hard copy to the Programme Secretary at De Morgan House.

Grants must be claimed in a specified financial year from 1 September to 31 August. Please ensure that you state in your application in which year you intend to claim the grant, bearing in mind that grants should normally be claimed not earlier than 3 months before, and not later than 3 months after, the event for which the grant is made.

Who may Apply

For Schemes 1,2,3,5 and 6 any mathematician working in the UK is eligible to apply for a grant, but if the applicant is not a member then the application must be countersigned by an LMS member. For Scheme 4, only LMS members working in the UK are eligible.

When to Apply

Please note that applications will not be considered between mid-June and mid-September. The main meetings of the Committee are held in February and September. Additional meetings are held in between, but time at these is very limited and it cannot be guaranteed that your application will be considered. For the date of the next meeting please contact Sylvia Daly (grants@lms.ac.uk), but above all please note that some of the individual schemes have their own deadlines: these are detailed under the headings for each scheme.

Assistance

Queries regarding applications can be addressed to the Programme Secretary, Stephen Huggett (tel: 01752 232710, email: s.huggett@plymouth.ac.uk) or Sylvia Daly (tel: 020 7291 9971 email: grants@lms.ac.uk), who will be pleased to discuss proposals informally with potential applicants and give advice on the submission of an application.

Multiple Applications

The Society does not like to receive sequential applications for grants to

support the same or closely related events, and will not allow its limits for individual schemes to be exceeded by artificially sub-dividing an application into a number of separate requests under different headings.

Notes for Guidance

Applicants should keep in mind the following points:

1. The committee does not normally meet the full cost of an activity. Rather it aims to give added value to an event largely funded by other means, or to bridge the gap between cost and the resources that might reasonably be made available by a university department.
2. The grants do not cover departmental overheads. The committee will generally not allow items such as secretarial costs, which could be seen as part of normal departmental provision, or entertainment.
3. Applicants should note that our mileage rate is 23p.
4. Each of the schemes has a particular aim as well as its own financial limits. It is helpful if applicants consider carefully how their proposal fits the particular scheme in question, and its detailed rules (which change from time to time). Thus the academic justification for a Scheme 2 grant should focus on the benefit to UK mathematics that the proposed visit would bring, while that for a Scheme 5 grant should focus on the benefits in the Scheme 5 country. In neither case should it be assumed that the distinction of the visitor renders further justification unnecessary.
5. The committee is made up of mathematicians with a wide spread of research interests, but it should not be assumed that they are familiar with the technical details of any particular area of mathematics. Proposals are judged by the committee itself: although it may seek advice, it does not normally send proposals to referees. It is therefore important that the case for a grant should be written for the general mathematician and not for the specialist.
6. The committee judges each application on its merits. Since its membership changes from year to year, it should not be assumed that it is familiar with the details of previous applications and correspondence from earlier rounds; nor should it be assumed that a grant, for example under Scheme 3 or for a regular collaboration under Scheme 4, will be renewed repeatedly.
7. The limits mentioned in the various schemes are upper bounds, not standard awards. Grants are made to meet actual expenditure on items in the application, and any surplus must be returned to the Society, rather than retained for related purposes or carried forward to another year.
8. Applications should be brief and self-contained. Please do not append substantial documents that contain irrelevant detail or refer to websites for key information.
9. The task of collating applications, forwarding them to the committee, recording decisions, and preparing and checking notification letters is nontrivial and time-consuming. Please apply well in advance and bear in mind that you may not hear the outcome of an application immediately.

Grants awarded since November 2003

Scheme 1

Applicant	Title	Grant
S. Maharaj	10th International Conference on Algebraic Methodology and Software Technology (AMAST 2004)	£500
J-M. Vanden-Broeck	British Applied Mathematics Colloquium 2004	£3,740
V.C. Mavron	University of Wales Gregynog Mathematics Colloquium	£1,890
W.N. Everitt	Howard Hoare Symposium	£1,030
J. Paris	Turing 2004: A celebration of his life and achievements	£827
A. Kent	Strings, Fields and Mathematical Physics: Some solstitial reflections	£1,200
A.D. Scott	One-Day Meeting in Combinatorics	£1,200
D. Webdale	6th Annual Postgraduate Group Theory Conference	£2,300
A. Lacey	Statistical Mechanics: A conference in honour of the 75th birthday of Oliver Penrose	£2,400
B.M. Brown	Conference to mark the 60th birthday of Professor E.B. Davies, FRS	£1,630
J.K. Langley	One-Day Function Theory Meeting	£780
M. Mathieu	Belfast Functional Analysis Day 2004	£400
A.J.W. Hilton	Reading One-Day Combinatorics Colloquium	£425
R.R. Kerswell	Non-Uniqueness of Solutions to the Navier-Stokes Equations and their Connection with Laminar-Turbulent Transition	£3,000
H.D. Macpherson	British Logic Colloquium 2004	£3,000
R.J. Archbold	Discrete Groups and Hyperbolic Manifolds	£3,000

Scheme 1 (cont'd)

Applicant	Title	Grant
H. Bredmose	The Fascination of Fluid Mechanics	£2,500
A. Baker, T. Leinster, R. Steiner	19th British Topology Meeting	£2,500
F. Theil	Dislocation Patterns in Plastic Materials	£850
R. Weston	8th UK Meeting on Integrable Models, Conformal Field Theory and Related Topics	£1,910
D.B. Duncan	Numerical Analysis of Differential Equations (13th Scottish Computational Mathematics Symposium)	£1,000
P. Maini	Mathematical Virology (INI Satellite Meeting)	£2,300
A.J. Willmott, I.D. Abrahams	Professor Graham Wilks Retirement Meeting	£1,500
K.M. Goda	Second North Eastern Postgraduate Pure Mathematics Workshop	£1,359
S. Velani	Metric Number Theory and its Applications: A meeting in honour of Maurice Dodson	£3,000

Scheme 2

Applicant	Visitor	To Visit	Grant
A.B. Piunovskiy	O. Hernandez-Lerma	Liverpool, Edinburgh, King's College London	£1,050
A. Ranicki	W. Lück	Edinburgh, Southampton, Imperial College	£800
S. Foss	V. Yurinsky	Heriot-Watt, Edinburgh, Cambridge	£1,200
M. Ruzhansky	L. Rodino	Imperial College, Edinburgh, Bristol	£1,150
R.F. Streater	J. Dolbeault	King's College London, Sussex, Oxford, Bristol, Bath	£982

Scheme 2 (cont'd)

Applicant	Visitor	To Visit	Grant
J. Pan	K. Fang	Manchester, London School of Economics, Sheffield	£1,000
S. Donkin	E. Friedlander	Imperial College, Cambridge, Edinburgh	£650
A. Pushnitski	D. Chelkak	Loughborough, Sussex, King's College London	£795
X. Mao	G.S. Ladde	Strathclyde, Newcastle, Edinburgh	£850
S. Rees	B. Nucinkis	Newcastle, Edinburgh, Glasgow	£625
A. Duncan	A. Vdovina	Newcastle, QMUL, Edinburgh, Heriot-Watt	£1,100
S. Foss	V. Lotov	Heriot-Watt, Manchester, Cambridge	£800
A. Daletskii	Y. Kozitsky	Nottingham Trent, Swansea, Imperial College	£770
G. Roehrl	G. Pfeiffer	Birmingham, UMIST, Newcastle	£800
E.V. Ferapontov	L. Bogdanov	Loughborough, Leeds, Imperial College	£1,000
R.H.J. Grimshaw, K.R. Khusnutdinova	L.A. Ostrovsky	Loughborough, Hull, University College London	£1,200
N. Vorobjov	M. Korovina	Bath, Oxford, Manchester	£1,000
K. Khanin	A. Mahalov	Cambridge, Hull, University College London	£1,100
J.K. Truss	A.S. Morozov	Leeds, Cambridge, QMUL, Manchester	£1,200
V.V. Goryunov	V.D. Sedykh	Liverpool, Warwick, Leeds	£1,140
V. Jha	N.L. Johnson	Glasgow Caledonian, Heriot-Watt, Glasgow	£600

Scheme 2 (cont'd)

Applicant	Visitor	To Visit	Grant
J.A. Vickers	J. Lega	Southampton, Strathclyde, Cambridge	£740
N. Janson	E. Schöll	Loughborough, Nottingham, Exeter	£1,000
M. Bartucelli	E. Dinaburg	QMUL, Imperial College, Exeter	£1,100
A. Grigor'yan	L. Saloff-Coste	Imperial College, Cambridge, Oxford	£800
V.M. Rothos	E. Doktorov	QMUL, Aston, Heriot-Watt	£900
Z.A. Lykova	Y. Zhang	Newcastle, Nottingham, Leeds	£1,200

Scheme 3

Applicant	Institution	Title	Grant
Y.V. Kurylev	Loughborough	British Inverse Problems Workshops	£1,200
X-M. Li	Nottingham Trent	East Midlands Stochastic Analysis Seminar	£1,200
H.R. Dullin	Loughborough	East Midlands Mathematical Physics Seminar	£1,000
R.B. Hoyle	Surrey	Nonlinear Dynamics and Applications (PANDA)	£600

Scheme 4

Applicant	Institution	Collaborator	Institution	Grant
G. Everest	East Anglia	G. Cornelissson	Utrecht	£500
G. Robertson	Newcastle	D. Rattaggi	ETH Zurich	£500
A. Balinsky	Cardiff	S. Vugalter	Munich	£500
A. Ranicki	Edinburgh	D. Sheiham	International, Bremen	£500

Scheme 4 (cont'd)

Applicant	Institution	Collaborator	Institution	Grant
C.W. Parker	Birmingham	S. Shpectorov	Bowling Green State	£450
D. Broomhead	UMIST	J.R. Terry	Loughborough	£250
A. Manning	Warwick	K. Simon	Budapest	£500
R. Brown	Bangor	O. Mucuk	Erciyes	£500
G.A. El	Coventry	V.V. Khodorovskii	St Petersburg	£500
J.B. Griffiths	Loughboroug	J. Podolsky	Charles	£500
O. Zaboronski	Warwick	R. Ravindran	Brandeis, USA	£500
Y. Chen	Imperial College	A. Its	Indiana	£250
M. Katzman	Sheffield	G. Lyubeznik	Minnesota	£280

Scheme 5

Applicant	Visitor/Institution	To Visit	Grant
T. Zhang, H. Zhao	Z. Ma (Chinese Academy of Sciences)	Manchester, Swansea, Loughborough, Warwick, Hull	£1,050
A.A. Ivanov	J. Hosack (South Pacific)	South Pacific	£825
H.P. Bruin	O. Volkova (National Academy of Sciences of Ukraine)	Surrey, Warwick	£1,400
H.G. Dales	H. Dedania, A.I. Singh (Sardar Patel, Delhi)	Sardar Patel, Tribhuvan, Delhi	£450
S.B. Cooper	A. Li (Chinese Academy of Sciences)	Chinese Academy of Sciences	£1,000

Scheme 6

Applicant	Institution	Collaborator	Institution	Grant
J.R. Terry	Loughborough	J. Chalk	Queensland	£500

THEATRE REVIEW

Proof by David Auburn

Rapture Theatre Company, The Arches Theatre, Glasgow

Though the visibility of mathematics and mathematicians in the media has been rising recently, a play centred on contemporary pure mathematics research is still a rare animal. 'Proof' won a Pulitzer Prize for its author David Auburn in 2001, and has been much praised, not least in two enthusiastic reviews in the *Notices of the American Math. Soc.* [1]. But this touring production by Rapture Theatre – seen at the Arches Theatre in Glasgow – didn't leave me feeling similarly enraptured.

The play is set in the back yard of the Chicago home of a brilliant but mentally fragile 53-year-old mathematician, Robert – a performance by Michael Mackenzie which conveyed well a father's love for a self-sacrificing

daughter and his fears of his own encroaching old age and mental demons, but failed to hint at that intensity of a young John Nash which – we are led to believe – must once have driven him on. The action opens on the evening before his funeral, as he appears in the imagination of his 25-year-old daughter Catherine, beautifully played by Lorna McDevitt. She had dropped out of the early stages of an undergraduate mathematics degree to care for her father through his debilitating mental illness. The other characters are Hal (Andrew Clark), a former PhD student of Robert who is now prospecting in Robert's study for nuggets of mathematical gold buried in the 103 scribbled notebooks he left behind; and Catherine's older sister Claire (Lyn McAndrew), a successful Wall Street analyst who has flown home for the funeral.

Subsequent scenes range backwards in time to periods when Robert was alive and apparently lucid, and forwards to the days following



the funeral. In fact, however, these jumps are clearly sign-posted, and are the only mildly unusual structural features of what is at its heart a fairly conventional drama of human relationships. The plot hinges on the appearance of an additional notebook containing a beautiful proof of an amazing theorem. (Of course, we're not told what the result is, but the text hints at something number theoretic.) Although the notebook and handwriting are identical to the others, Catherine claims the proof is hers. Hal and Claire don't believe her, and the story unfolds as a morality tale on the limits of rationality in human intercourse.

So, a diverting and even thought-provoking evening in which the rigour of the mathematics and the other-worldly air of the mathematicians counterpoints the down-to-earth concerns and material success of the Wall Street analyst. Why then was I not enthralled? First, there were problems with this production – messy set, uncertain scene changes,

some unconvincing acting. In particular Claire came over as shrill and uncaring, so unbalancing our sympathies totally towards Catherine; perhaps the forthcoming film version starring Gwyneth Paltrow will be more balanced in this respect. But my main objections were to the play, in particular to its use of mathematics: fundamentally, this served as a tool to flatter the audience, fooling us into believing we're dealing with something more profound than a rather clichéd family drama. The familiar stereotypes are trotted out – the close links between genius and madness, the nerdy male graduate student, best work before 30, burnt out by 50.... Do we really still have to put up with all this? And I'm afraid that the film when it comes will be no better in these respects.

Ken Brown
Glasgow University

[1] *Notices of the Amer Math Soc.* Vol.47, pp 1082-1084 and Vol 148, pp 596-597.

LMS INVITED LECTURE SERIES

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.

Recent lecturers in the series have been P.F. Baum (1995), F.J. Almgren (1996), J. Alperin (1997), D. Zagier (1998), A. Mielke (1999), B. Dubrovin (2000), T. Goodwillie (2001), P. van Moerbeke (2002), M. Fukushima (2003).

The 2004 Invited Lectures Series will be given at the University of Southampton by M.W. Davis (Ohio State University) on *The Geometry and Topology of Coxeter Groups*.

For the 2005 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. Enquiries about this series should be directed to the Programme Secretary at the Society (grants@lms.ac.uk). Programme Committee expects to make a decision on **Thursday 23 September 2004**.

Gresham College Lectures in Mathematics

Autumn 2004

Robin Wilson, Gresham Professor of Geometry

Gresham College, Barnard's Inn Hall, Holborn, London EC1N 2HH (near Chancery Lane tube station) at 6 p.m. on Wednesday evenings

Entrance free. Phone: 020-7831-0575; website: www.gresham.ac.uk

The multi-cultural origins of mathematics

Mathematics has a long pedigree, developing from widely differing cultures over thousands of years. This series of three lectures illustrates a wide range of mathematical activity from Ancient Egypt, Mesopotamia, Greece, China, and the Mayan culture of Central America. The story will be further developed in future lectures.

6 October: Keep taking the tablets

Many thousands of surviving mathematical clay tablets provide much information about Mesopotamian mathematics – but what mathematics did they do, and why is it relevant to us today? In contrast, although the Egyptian pyramids provide us with an impressive primary source, only a handful of mathematical papyri survive. What do they contain, and what influence did they have?

27 October: Here's looking at Euclid

It is often argued that mathematics as we know it today originated in Greece, and names such as Pythagoras, Euclid and Archimedes are certainly part of our culture. But Archimedes did much more than run naked through the streets shouting Eureka! So what specific contributions did the Greeks make, what types of mathematical problem interested them, and why do we now consider them so important?

17 November: Much ado about zero

The concept of zero developed in many cultures over thousands of years. Why did such a 'natural' idea take so long? This lecture illustrates the wide-ranging mathematical achievements of China, India and Central America over a thousand-year period – some not to be rediscovered in Europe for a further thousand years – before returning to the elusive origins of zero.

RECORDS OF PROCEEDINGS AT MEETINGS

REGIONAL ORDINARY MEETING

held on *Wednesday 12 May 2004* at the University of Nottingham. About 50 members and visitors were present for all or part of the meeting.

The meeting began at 2:30 pm, with Professor F.C. KIRWAN, FRS, in the Chair. Nine people were elected to Ordinary Membership: K.W. Blake, N. Diamantis, D. Gillooly, J. Grbic, J.C.R. Hunt, A. Kresch, V. Mikulin, E. Pfluegel and J.F. Richardson; three people were elected to Associate Membership: E.T. Crane, T.S. Gee and R.T.R. Vale; and one person was elected to Reciprocity Membership: J.P. Henniger.

The Records of the Proceedings of the Society Meetings held on 9 January and 20 February 2004 were signed as a correct record.

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

Professor I.B. Feshenko introduced a lecture given by E. Bayer-Fluckiger on *Euclidean number fields and euclidean minima*.

Professor J.E. Cremona introduced a lecture given by B. de Smit on *The elliptic curve in Escher's Print Gallery*.

Professor D.W. Hoffman introduced a lecture given by J-L. Colliot-Thélène on *From linear algebraic groups to rationally connected varieties*.

The prize for the poster competition was awarded jointly to Mark Lingham, Richard Barraclough and Simon Goodwin.

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

After the meeting a dinner was held at the Mem-Saab Restaurant, Nottingham.

LMS MIDLANDS REGIONAL MEETING

The LMS Midlands regional meeting was held in Nottingham on 12 May. The meeting opened with a welcome from the President of the Society, Frances Kirwan, during which there was an opportunity to sign the LMS membership book for those who had not already done so. This fascinating record dates back to the mid 19th century and within its pages are the signatures of a whole host of prominent mathematicians from the last 150 years, including famously the signature of De Morgan on the very first page.

The meeting was very well attended, with over fifty persons present for much of the day. Participants were treated to three engaging talks from internationally renowned speakers, each able to give great insight into their subject matter, while keeping the content easily accessible to the general audience present. The first speaker, Professor Eva Bayer-Fluckiger (Lausanne Polytechnic), gave an overview of the problem of determining when an algebraic number field is Euclidean. This long established problem - together with the more general question of finding the Euclidean minima of a number field - has interested mathematicians for over 100 years, and Professor Bayer-Fluckiger has recently been able to establish important new results in the area. In particular, she has shown that the Euclidean minimum of a number field is always less than or equal to its discriminant.

After a short break for refreshments, the meeting resumed with a captivating presentation on the mathematics behind Escher's 'Print Gallery'. This was given by Dr Bart de Smit (University of Leiden), who 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 (www.escherdroste.math.leidenuniv.nl) which has been visited over 300,000 times, testimony to the success of the project.

The final talk was given by Professor Jean-Louis Colliot-Thélène (CNRS and Université Paris-Sud), who introduced the notion of a rationally connected variety. This relatively new concept is the weaker cousin of that of a rational (or unirational) variety, but is in some ways more natural than either of these. Professor Colliot-Thélène went on to discuss how this may be utilised when one considers varieties with the additional structure of a linear algebraic group, a particularly fruitful example being the case of connected reductive groups over number fields.

A poster competition was held during the meeting, with the £100 prize being shared jointly by 3 entrants (Mark Lingham, Richard Barraclough, Simon Goodwin). Posters were of a very high standard on subjects ranging from modular forms over number fields to the theory of finite simple groups.

Matters concluded with a conference dinner in Nottingham city centre which was very much enjoyed by all who attended. The meeting was followed by a 3-day workshop on *Quadratic forms, algebras with involution and algebraic K-theory*, the first time this area of research has been brought to the UK.

Paul Smith
University of Nottingham

BOOK REVIEW

Music and mathematics from Pythagoras to fractals Fauvel, Flood and Wilson (eds.), 2003, OUP, ISBN 0 19 851187 6, 189pp, £39.50

For a composer, some of the moments of greatest excitement lie in achieving a successful integration of 'mathematical' and 'musical' processes, though we may not think about it in these terms. Take the canon (a musical device that is essentially a translational symmetry) as an example: a very simple experiment that anyone can do is to set up a time delay between two copies of the same sound source (such as that produced when listening to digital radio simultaneously with an analogue receiver¹). At first – provided the time interval allows it to be readily perceived – this simple geometrical effect can be very engaging to the ear (given how easy it is to create a satisfying effect in this way it is perhaps not surprising that canon is one of the earliest and most prevalent devices of musical composition). After the canon we have made has been going for a while, the novelty wears off and we develop the need for some kind of change or a new layer of interest. The nature and precise timing of such alterations, a calculation we usually make using our intuition, is one of the most basic aspects of the art of composition. Symmetries are found throughout music but a perfect symmetry realised without human intervention can be bland and lacking in tension. A process that is too obvious trails far behind the listener's ability to predict its outcomes. (Such music – to borrow the words of Harrison Birtwistle – 'finishes before it stops'.) The music we value most seems to be that which succeeds in achieving a 'perfect' integration between – in the sense of Plato's Divided Line – image and form.

¹ The actual effect varies from instance to instance, depending on the processor power of the digital device, with the time delay between the different sources varying from a few milliseconds to several seconds. The ideal delay for creating the effect of a 'canon' lies somewhere in the middle of this range.

Most of the ten chapters that make up this volume serve to highlight this, directly or indirectly, in diverse ways. Wilfred Hodges's 'The Geometry of Music' is a lucid and deft guide through the territory of 'pure' mathematics balanced against musical constraints, with the aid of sharp observations such as the comparison of Haydn's conception in the palindromic 'Menuet al Rovescio' for piano against the physical reality of the effect when a tape of the performance is reversed. The musical examples, taken from throughout history, are easy to grasp and the chapter ends with a helpful list of further examples to be followed up by the reader. In his chapter 'Composing with Numbers', Jonathan Cross illustrates cases where composers have visited the border with mathematics-heavy musical processes, likening the effect of Boulez's iconic serial piano piece *Structure Ia* with Cage's aleatorically generated *Music of Changes*. Boulez himself characterises the pitfalls of going too far in the direction of organisation vs. composition as 'maniacal inanity'. Cross points us back to our ears by saying 'whether or not *Structures* is maniacally inane is for the individual listener to decide'.

In their iconic experiments of the 1950s and 1960s, both Boulez and Cage were driven by the desire to discover a musical idiom that was wholly new. Not all such attempts have been so musically adventurous, suffering from an inconsistency between the mathematical idea and the musical mindset through which it is being fed, of which Robert Sherlaw Johnson's composition 'fractal in A flat' is perhaps an example. In his article (called 'Composing with Fractals') we can observe the kinds of often arbitrary modifications a composer is required to enact to make the maths fit the well-tempered chromatic of her or his customary musical idiom. The author asks some interesting questions about pattern, chaos, perception and decision-making but his musical

imagination appears somewhat trapped by the bland limitations of MIDI (musical instrument digital interface) which he uses to translate the computer data into 'musical' data. 'Microtones and Projective Planes' by Carlton Gamer and Robin Wilson elaborates on existing musical theory to offer composers a previously unidentified method of set transformation. Beginning with a demonstration of how the octave may be divided equally in ways other than by the customary twelve, the chapter shows how difference sets (of musical intervals) lend themselves to cyclic design, which allows them to be mapped onto finite projective planes. Wilson's musical example, one variation from a set of variations called 'Fanovar', offers an unremarkable realisation of this fascinating idea.

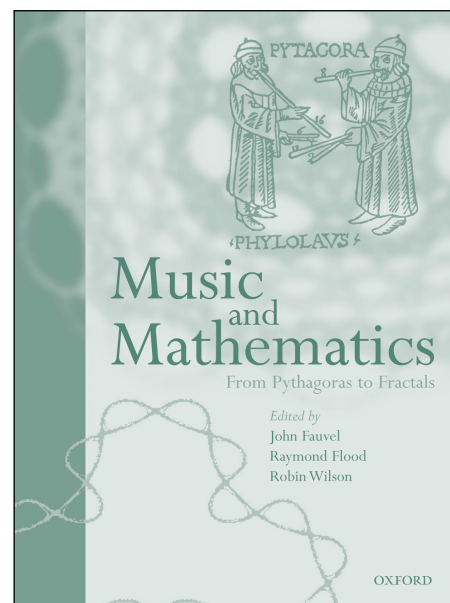
These examples highlight the challenges for composers mapping mathematical formulae onto music to create any kind of sophisticated *musical* idea. Though it may

consist of notes, durations and other recognisable musical features, such material – like our 'instant canon' – remains the domain of mathematics until it has been channelled through the human mind (and *body*) where it is scanned for sense and recognition on the *human* scale as 'music'. A significant dimension of the complexity of this translation lies with the crystalline properties of human aural perception and memory. Charles Taylor's article demonstrates the degree to which cognition is integral to the science of musical sound. Such factors as our ability to build a database of sound recognition, or to ignore sounds that are of no importance to us, highlight areas for psycho-acoustic research, as well as going some way to explaining why Beethoven sounded as dissonant and unfamiliar to 19th century ears as new music can sound today.

Good music transcends the mathematics that underlies it but perhaps, paradoxically, it is our hunger to absorb the mathematical structures, which themselves transcend music, that makes this book so enticing: to glimpse the spiral, circle, tree or wave form that lifts our horizon beyond the level of the individual mind and body to the category of universal truth that is mathematics. This volume is richly-furnished with such vistas, including elegant chapters on musical tuning and temperament, bell-ringing and fretted instruments (Ian Stewart's 'Faggot's Fretful Fiasco'). Throughout this well-produced book, the roughly equal measures of mathematical and musical examples never overwhelm the text, which covers the ground at a pace suited to the informed reader who wants to get straight to the concepts without narrative or theoretical clutter. Given the inherently complex nature of the subject matter this seems quite an achievement.

Dorothy Ker

Dr Dorothy Kerr is a composer. She is AHRB Fellow in the Creative and Performing Arts at Reading University.



EPSRC

Noncommutative spaces: their topology and measure theory



LMS/EPSRC Short Course

University of Southampton, 6-11 September 2004

Organiser: Jacek Brodzki (Southampton)

Noncommutative geometry treats all algebras, commutative or not, as if they were algebras of functions on spaces. Among the basic tools for the study of these noncommutative spaces is the theory of operator algebras and their invariants. The aim of this course is to provide students with the essential background in the theory of C^* -algebras together with up-to-date applications to the study of topology, measure theory and geometry of noncommutative spaces. This course will take the students from essential notions of K -theory and K -homology of C^* -algebras to some of the most exciting and current research problems. The programme consists of the following lecture courses:

- **The reduced C^* -algebra of a group and the Baum-Connes conjecture** Paul Baum (Penn State)
- **C^* -algebras and their topological invariants** Jacek Brodzki (Southampton)
- **C^* -algebras and the Plancherel theorem for reductive groups** Roger Plymen (Manchester)
- **Introduction to exact C^* -algebras and groups** Simon Wassermann (Glasgow)

More details of the course are available at: <http://www.maths.soton.ac.uk/LMScourse>.

The registration fee is £110. 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

Application forms may be obtained from Isabelle Robinson, Administrative Officer at the Society (email: robinson@lms.ac.uk, fax: 020 7291 9978) or from the LMS website (www.lms.ac.uk/activities/research_meet_com/short_course/20_form.html).

Numbers will be limited and those interested are advised to make an early application. The closing date for applications is **Monday 12 July**. Completed forms should be returned to the Administrative Officer by email, fax or post (details above).

LONDON MATHEMATICAL SOCIETY

in association with the Isaac Newton Institute for Mathematical Sciences

Spitalfields Day

Monday 9 August 2004

Magnetic Reconnection Theory

- | | |
|---------------|--|
| 9:00 – 9:30 | G. Hornig, Bochum University
<i>The Topology of Three-Dimensional Reconnection</i> |
| 9:30 – 10:00 | J.D. Gibbon, Imperial College
<i>Collapse of Magnetic Nulls</i> |
| 10:00 – 11:00 | Contributed Talks and Discussions |
| 11:00 – 11:30 | Coffee |
| 11:30 – 12:30 | P.L. Pritchett, UCLA
<i>Overview of Collisionless Reconnection Theory</i> |
| 12:00 – 12:30 | M. Hesse, NASA Goddard
<i>The Physics of the Reconnection Diffusion Region</i> |
| 12:30 – 13:00 | Contributed Talks and Discussions |
| 13:00 – 14:30 | Lunch |
| 14:30 – 15:00 | F. Pegoraro, University of Pisa
<i>The Role of the Kelvin-Helmholtz Instability in Magnetic Reconnection</i> |
| 15:00 – 15:30 | B.K. Shivamoggi, Univ. of Central Florida
<i>Critical Exponents and Universality in Fully Developed Turbulence</i> |
| 15:30 – 16:00 | Tea |
| 16:00 – 16:30 | TBA |
| 16:30 – 17:15 | Contributed Talks and Discussions |
| 17:30 – 18:30 | Reception |

The London Mathematical Society Spitalfields Days are an opportunity for recent developments in specialist topics to be made known to the general mathematical community.

These lectures are linked to the Isaac Newton Institute programme on *Magnetic reconnection theory* (2-27 August) www.newton.cam.ac.uk/programmes/MRT/index.html. Anyone interested is welcome to attend; talks will be aimed at a general mathematical audience. Please let Tracey Andrew at the Institute know by **30 July** if you intend to come, to help us plan for lunch (tel: 01223 335984; fax: 01223 330508; email: t.andrew@newton.cam.ac.uk).

There are limited funds available to assist research students to attend, please apply by **30 July** to Tracey Andrew by email (t.andrew@newton.cam.ac.uk) or post (Newton Institute, 20 Clarkson Road, Cambridge CB3 0EH). Scientific enquiries may be addressed to Terry Forbes (terry.forbes@unh.ac.uk) or Eric Priest (erp@st-andrews.ac.uk).

EPSRC

Algebraic Groups LMS/EPSRC Short Course



University of Birmingham, 13-17 September 2004

Organiser: G. Röhrle (Birmingham)

Algebraic groups are at the very heart of new and central developments in modern algebra such as quantum groups, p -adic groups, Hecke algebras and geometric representation theory. The aim of this instructional course is to provide an introduction for non-specialists to this wide and classical field. More precisely, the goal is to provide a general understanding of the fundamental methods and results in algebraic group theory, in particular, the structure and representation theories of reductive algebraic groups, their connection with finite groups of Lie type, and Lie algebras.

There will be three courses of lectures:

- **Introduction to algebraic groups and Lie algebras** S. Donkin (London)
- **Root systems, coroots and Weyl groups** R. Lawther (Cambridge)
- **Basics of representation theory of algebraic groups** A. Premet (Manchester)

There will also be three additional special lectures on some more recent aspects of modern development in the theory:

- **Aspects of modular representation theory** J.C. Jantzen (Aarhus)
- **Weyl groups, affine Weyl groups and Hecke algebras** G. Malle (Kassel)
- **Subgroup structure of reductive algebraic groups** M. Liebeck (London)

There will be tutorial support for the three courses. Further details of the programme and a schedule of the talks, as well as information for suggested preparatory reading material, may be found on the web: <http://web.mat.bham.ac.uk/G.E.Roehrle/course04.html>.

The registration fee 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 department from its EPSRC Doctoral Training Account.

Application forms may be obtained from Isabelle Robinson, the Administrative Officer, at the Society (email: robinson@lms.ac.uk, fax: 020 7323 3655) or from the LMS website (www.lms.ac.uk/activities/research_meet_com/short_course/19_form.html).

Numbers will be limited and those interested are advised to make an early application. The closing date for applications is **Monday 12 July 2004**. Completed forms should be returned to the Administrative Officer by email, fax or post (details above).

CALENDAR OF EVENTS

This calendar lists Society meetings and other events publicised in the Newsletter. Further information can be obtained from the appropriate LMS *News/letter* 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 2004

- 1 Professor Graham Wilks Retirement Meeting, Keele University (327)
- 1-2 Fascination of Fluid Mechanics, Bristol University (327)
- 2 LMS Northern Regional Meeting, Newcastle University (327)
- 4-11 ICME10, Copenhagen, Denmark (308)
- 4-14 Moonshine Conjectures and Vertex Algebras Workshop, Edinburgh (324)
- 5-9 Geometry and Topology of Coxeter Groups, M.W. Davis, LMS Invited Lectures, Southampton University (326)
- 7-8 25 Years of Communicating Sequential Processes, South Bank University (327)
- 9 Scalar Mixing in Fluid Flows and Mappings Meeting, Exeter University (326)
- 10 Moonshine Conjectures & Vertex Algebras, LMS Spitalfields Day, Edinburgh (327)
- 11-17 Real Analysis and Measure Theory Meeting, Italy (323)
- 12-16 Matrix Ensembles and L-functions Workshop, INI, Cambridge (323)
- 12-16 IWOTA, Newcastle University (325)
- 12-16 Algebraic Methodology & Software Technology Conference, Stirling University (328)
- 13-14 Networks for Non-Networkers Workshop, University College London (328)
- 23-29 International Mathematics Competition for University Students, Skopje, Macedonia (326)
- 23-30 Operator Algebras and Random Matrices Workshop, Ambleside, Cumbria (324)

AUGUST 2004

- 5-7 Discrete Groups and Hyperbolic Manifolds Conference, Aberdeen University (326)
- 9 Magnetic Reconnection Theory, LMS Spitalfields Day, INI, Cambridge (328)
- 9-11 Three-Dimensional Geometry and Topology Workshop, Oxford University (324)
- 23-27 Quantum Information Theory Conference, INI, Cambridge (323)
- 25-28 EuroScience Open Forum 2004, Stockholm (325)

SEPTEMBER 2004

- 1-3 UMTC, Birmingham University (326)
- 1-6 Pan-African Congress of Mathematics, Tunisia (308)
- 6-8 British Logic Colloquium 2004, Leeds University (327)
- 6-11 Noncommutative spaces: their topology and measure theory, LMS/EPSRC Short Course, Southampton University (327)
- 6-17 Magnetohydrodynamics of Stellar Interiors, INI, Cambridge (325)
- 7-10 Sheffield Machine Learning Workshop, Sheffield University (327)
- 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/EPSRC Short Course, Birmingham University (328)
- 13-18 Stochastic Geometry CIME Summer Course, Taranto, Italy (324)
- 14-18 Boundary Integral Methods III: Theory and Applications, IMA Conference, Reading University (328)
- 17 LMS South West & South Wales Regional Meeting, Exeter University (328)
- 20 One Day Function Theory Meeting, De Morgan House, London (326)
- 20-24 VII Congress of SIMAI, Venice, Italy (327)
- 20-24 Mathematical Analysis Course, Granada, Spain (328)

**EDMUND TAYLOR WHITTAKER
DE MORGAN MEDALLIST
1935**



Professor Whittaker received the De Morgan Medal on 14 November 1935. Extract from the President's address: 'Professor Whittaker is the author of some sixty papers as well as of five books. His papers concern such a diversity of themes as automorphic functions, the special functions of mathematical physics, the differential equations of dynamics, spec-

troscopy, integral equations, determinants, and the newer theories of space, gravitation and electromagnetic phenomena. Time does not permit reference to each individual paper, but I must not omit to mention the most sensational of them all which contained the general solutions of Laplace's Equation and of the Equation of Wave-motions.'