

THE LONDON MATHEMATICAL SOCIETY NEWSLETTER

No. 317

July 2003

FORTHCOMING SOCIETY MEETINGS

Tuesday 22 July 2003 – Edinburgh

Hodge Centenary Meeting – Joint Meeting with the Edinburgh Mathematical Society

Friday 24 October 2003 - Southampton

South West and South Wales Regional Meeting

Nonlinear Dynamics

Friday 21 November 2003 - London

L.C.G. Rogers, M.H.A. Davis (Naylor Lecture)

Friday 20 February 2004 - London

D. Schleicher, S.M. Rees (Mary Cartwright Lecture)

COUNCIL DIARY

9 May 2003

Peter Goddard had told us at the January Council meeting that one of the first tasks of any new President was to nominate a successor. We had not expected the succession to be relevant as soon as it will be, and we will be sorry to lose him prematurely, but at the May Council meeting we were very happy to congratulate him on his prestigious new appointment and impending move to Princeton. And we applauded his excellent choice of Frances Kirwan as our President Designate. She will stand for election in November to be the Society's second ever woman President.

The Treasurer explained that the BMC Reserve Fund, which was formerly held by the Edinburgh Mathematical Society, no longer exists. But this does not indicate any change in the level of support that the LMS expects to give to the BMC in future.

The Publisher showed us flyers for the relaunch of *Compositio Mathematica* as a journal in the LMS stable, in which the 'runners and riders' of the first issue were listed. The relaunch in 2004 will be at two thirds of the 2003 price.

Council approved in principle details of remit and structure for the Mathematics Promotion Unit which it is hoped to set up in De Morgan House, staffed by at least a part-time 'Press Officer'. The remit of the unit is wide-ranging. We would like to build up our links with key figures in government and the media, increase our lobbying, and produce and distribute briefing papers and press releases. We should produce comprehensive data sets on mathematics education and research, responses to government reports, submissions to inquiries. And incidentally, with such a unit in place we should be in a better position to respond rapidly to remarks reported in the media displaying misunderstanding of what mathematics is and mathematicians do, which simply need to be quickly and authoritatively challenged. The Society needs to use the media more effectively than it currently does, for the benefit of mathematics, and with the help of the proposed unit it would be able to do that.

The Education Secretary presented the response prepared by a subcommittee of four to the government's recent White Paper on 'The future of higher education'. The response has been submitted on behalf of the Society and can be viewed on the Society's web site.

Council studied a report from Ursula Martin, Chair of the Computer Science Committee, which detailed the outcomes of an informal meeting of mathematicians and computer scientists on 'mathematics and e-science'. The report identified e-science research

opportunities in a spectrum of mathematical areas ranging through mathematical modelling, computational logic, stochastic analysis and much more. Ursula continues discussion with EPSRC Programme Managers Annette Bramley (mathematics) and Vince Osgood (IT and computing).

The General Secretary also reported on EPSRC matters. A first meeting between the President and Annette Bramley is currently being scheduled. And the Society is busy setting up a committee to lead its initiative on 'Mathematics and the Biological Sciences'.

Sarah Rees

INTERNATIONAL REVIEW OF MATHEMATICS

Report 5

Dr Stephen Huggett has been appointed Scientific Secretary of the Review. Stephen is a lecturer at the University of Plymouth and is currently Programme Secretary of the LMS.

The Steering Group has been giving detailed thought to the structure of the Review Week and in particular to the visits that subgroups of the International Panel will make. The visits should emphasise quality not scale, picking up on the best mathematics wherever it is done – they must not give the impression that all good mathematics is done in large institutions. The Group developed a multi-level concept for the eight visits. Each visit will have a single venue, selected for its size, position, facilities and its international standing, and with a substantial community of young postdoctoral and postgraduate students. At each venue, key institutions of high standing in the region centred on the venue would jointly act as "hosts" and would present the core material to the sub-Panel. Inevitably, the number of "hosts" will vary from venue to venue. In addition, there would also be an opportunity for mathematics done in other institutions, groups and centres in the region to be seen by the Panel.

It is important that the presentations made during the visit are demonstrative of the strengths of the region and the dynamics for the future. They should be subject-centred, highly selective and regionally inclusive. The Steering Group is considering the concept of inviting individuals (possibly not from the venue) to coordinate and plan the presentations on behalf of the region and to ensure a proper reflection of the region's strengths. The sub-Panel will want to have full and open interaction with postgraduates and postdoctorals. There would be a buffet lunch at which the sub-Panel can mix freely with mathematicians, particularly young staff and postdoctorals.

In developing these guidelines for the visits, the Steering Group was very aware that the actual programmes may end up being rather different in the eight venues, reflecting the differing natures of the regions and institutions. The Steering Group will be contacting the Heads of Departments in the venues and the hosts shortly, after which the list of venues will be announced on the Review web site (www.cms.ac.uk/irm/)

In addition to the visits, the Panel will receive a number of briefings, to cover the structure of the Research Base (Research Councils and Funding Councils), EPSRC and the Mathematics Programme, the RAE, other support mechanisms such as the Royal Society and the LMS. A considerable amount of data will be provided in advance, describing the nature of the UK mathematics and statistics community and the research being done.

There is a contact point on the Review website for feedback (irm@lms.ac.uk). Please use this to send in your own comments and suggestions.

STYLE COLUMN

Regular readers of the *Newsletter* will have noticed the constancy of its format and style to date, despite prognostications to the contrary. However, readers will also be familiar with the fact that knowledge of the first n terms of a sequence does not determine the $n+1$ term without further information - and in this case the information is that after initial contacts with several design consultancy firms the Newsletter Editorial Board has now engaged one of these on the production of (we hope) the next issue on very reasonable financial terms. Alert readers will recall that there is no August issue, and so in September all LMS members can anticipate a quickening of the pulse as they open the usual, or perhaps unusual, envelope. We trust the intensity of this new experience will have no deleterious consequences.

David Chillingworth

NATIONAL TEACHING FELLOWSHIP SCHEME

We are delighted to congratulate Professor Amanda Chetwynd, a member of the LMS Council and Chair of the Personnel & Office Management Committee, who has been awarded a National Teaching Fellowship under the scheme to recognise and reward lecturers or learning support staff in higher education for their excellence in teaching. Amanda is Professor in Mathematics and Statistics at Lancaster University.

Each of the 20 Fellows recently announced, chosen from 81 nominations submitted by higher education institutions across England and Northern Ireland, will be awarded £50,000, to be used for projects that will make a significant contribution to learning and teaching.

The criteria used to select both the nominees and the final winners included the nominees' ability to influence and inspire their students, to inspire their colleagues in their teaching, to demonstrate a reflective approach to their teaching and to the support of learning, and to influence the teaching profession as a whole. The panel of judges also considered the quality and relevance of the projected use of funds to develop the winners' areas of expertise.

The NTFS is managed by the Institute for Learning and Teaching in Higher Education (ILTHE) on behalf of the Higher Education Funding Council for England and the Department for Employment and Learning in Northern Ireland, who fund the Scheme.

Amanda will receive her award from the Rt Hon Margaret Hodge, Minister for Lifelong Learning and Higher Education, at a gala event in London on 15 July.

FELLOWS OF THE ROYAL SOCIETY

Amongst those elected to Fellowship of the Royal Society in May 2003 were: Professor John Barrow, University of Cambridge; Professor Peter Green, University of Bristol; Professor John Papaloizou, Queen Mary, University of London; and as a Foreign Member, Professor Donald Knuth, Stanford University.

LMS PRIZES 2003

Polya Prize

PROFESSOR ANGUS MACINTYRE FRS of the University of Edinburgh, is awarded the Polya Prize for his widely influential contributions to model theory and its applications.

Over the last thirty years he has found many new applications of model theory in algebra, geometry, number theory, asymptotics and theoretical computer science. His work established a theory of p-adic semi-algebraic sets, and has since been widely used in p-adic contexts, for example to prove a conjecture of Serre on the rationality of Poincaré series. His papers on totally transcendental fields and on algebraic groups created new paradigms for research in these areas. His work on the first-order content of Weil cohomology has opened up new possibilities for applying model theory in algebraic geometry.

Berwick Prize

DR TOM BRIDGELAND of the University of Edinburgh is awarded the Berwick Prize for the paper: "Equivalences of triangulated categories and Fourier-Mukai transforms" published in the *Bulletin of the London Mathematical Society* Volume 31 (1999) pages 25 - 34.

This paper introduced new methods and solved an important question in algebraic geometry. Subsequently these pioneering methods have been used to illuminate concepts and to solve problems across a number of areas of mathematics.

In 1981, Shigeru Mukai established the duality result that the derived category of coherent sheaves on an abelian variety X and the one arising from the dual X^\vee are the same. Mukai conjectured that such a duality should hold more generally, in particular between a K3 surface X and a certain moduli space of vector bundles over X . Tom Bridgeland's paper gave a simple proof of Mukai's conjecture. In a joint paper with A. King and M. Reid, the methods were used to understand the generalised McKay correspondence between the geometry of crepant resolutions of a quotient singularity \mathbb{C}^3/G and the representation theory of the finite group G . Another application of these ideas gave rise to Bridgeland's proof of the conjecture that flops (which are transformations between certain 3-dimensional varieties) induce an equivalence between the relevant derived categories. A consequence is that birational Calabi-Yau three-folds have equivalent derived categories. In recent work he has applied his methods to problems of interest to mathematical physicists by providing a precise setting to study stabilities related to Dirichlet branes.

Senior Whitehead

DR PETER NEUMANN of Oxford University is awarded the Senior Whitehead Prize in recognition of his contribution to and influence on research into diverse branches of group theory, and for his broad-ranging service to British mathematics over many years.

Peter Neumann's research interests have included varieties of groups, finite permutation groups of degree p or $3p$ (where p is a prime), a classification of groups with a cofinite Jordan set, infinite Jordan groups, automorphism groups of ordered sets, Frobenius groups, and recognition algorithms for matrix groups.

In all these endeavours he has been instrumental in designing research programmes and setting up teams of experts to work on them. A list of his past research students is impressive not only for its length, but for the high proportion which are now prominent mathematicians in their own right.

Neumann takes a keen interest in the history of mathematics and especially in the history of group theory. As with his mathematical lectures, his history talks on Burnside, Galois and others are beautifully constructed and a delight to attend.

His contribution to the health of mathematics in this country is wide-ranging. He was until recently President of the British Society for the History of Mathematics. He was Chairman of the British Mathematical Olympiad Committee from 1995 to 1997, and chaired the UK Mathematics Trust from its inception in 1996 till now. He has been a long-term stalwart of the LMS, and served as Publications Officer for six years. As generations of Oxford graduates will confirm, he takes a keen and inspirational interest in undergraduate teaching and was a natural choice to produce the report on the structure of undergraduate degrees which bears his name.

He receives this accolade in recognition of his extensive contribution to a great many aspects of our discipline.

Whitehead Prizes

DR NICHOLAS DOREY of the University of Wales Swansea is awarded a Whitehead prize for his contributions to mathematical physics, specifically to the understanding of non-perturbative effects in gauge field theories.

In a remarkable series of papers produced over seven years in collaboration with Hollowood, Khoze and Mattis, he has developed powerful methods for the computation of non-perturbative (instanton) effects in supersymmetric gauge field theories. With Khoze and Mattis, he has provided remarkable and highly influential calculations of multi-instanton effects in N=2 supersymmetric gauge theory.

Dorey's work, often in collaboration, is characterised by the ability to find beautiful ways to perform exact computations. He has been one of the world leaders in the very significant developments in understanding of supersymmetric gauge theories that have taken place in recent years.

DR TOBY HALL of the University of Liverpool is awarded a Whitehead prize for his work on the dynamics of surface homeomorphisms. Hall has obtained some beautifully detailed and informative results, with the structure he has uncovered developing from, and extending, the one-dimensional theory, especially the famous Sarkovskii Theorem for interval maps, sometimes in unexpected ways.

Hall's results on forcing relations for periodic orbits of horseshoe type started with his thesis, and in recent years these results have been very considerably extended, with a reasonable conjecture for the full picture, in an extraordinarily rich study of horseshoe-like families, together with his collaborator, André de Carvalho.

The project continues to run apace, already represents an extremely important advance in the study of families of maps in low dimension, and is a quite startling example of what can be achieved from the topological viewpoint.

DR MARC LACKENBY of St Catherine's College and the University of Oxford is awarded a Whitehead prize for his contributions to three dimensional topology and to combinatorial group theory.

He has proved unexpected results about Dehn surgery, which is a much used method to construct a three-dimensional manifold M_2 from another one M_1 , based on a knot $K \subset M_1$ and a twisting coefficient p/q . One is a uniqueness result and the other provides a bound on the type of surgery that can give an 'exceptional' manifold.

He has found an algorithm enhancing Thurston's famous result giving the existence of hyperbolic structures on a large class of three dimensional manifolds. It allows one to calculate (up to explicit bounds) the volume of the (hyperbolic) complement of a class of knots. Another result is related to the famous 2π theorem of Gromov and Thurston that a

Dehn filling of a cusped hyperbolic manifold M^3 along a curve of length more than 2π always gives rise to a negatively curved manifold. Lackenby has shown that if 2π is replaced by 6 then the fundamental group of the resulting manifold is Gromov hyperbolic. A consequence is that at most 12 manifolds obtained by surgery on a hyperbolic knot can have non-negatively curved fundamental group. Conversely, it is known that the figure eight knot has ten exceptional surgeries.

His recent work on the Heegaard genus of coverings has opened up new relations with other areas of mathematics and there are exciting possible consequences for combinatorial group theory.

DR MAXIM NAZAROV of the University of York is awarded a Whitehead prize . He is famous for his work on the covering group of the symmetric group. He constructed the representations of the covering group of the symmetric group, thus solving a problem which had been open for 75 years. His work also opened the door for the construction of the irreducible modular representations of the covering group.

Nazarov has furthermore constructed Young symmetrizers for the covering group and, more recently, for Brauer centralizer algebras. He presented some of this work in an Invited Lecture at the 2002 International Congress of Mathematicians.

EPSRC POSTDOCTORAL FELLOWSHIPS IN MATHEMATICS

The EPSRC Mathematics Programme awards up to 10 postdoctoral fellowships in Mathematics each year. The aim of the fellowship is to help talented young researchers establish an independent research career shortly or immediately after completing a PhD.

The postdoctoral fellowships in mathematics will now be for a maximum of three years. They are open to mathematicians, statisticians and operational researchers who are in their final year PhDs or have recently completed PhDs. The fellow receives their salary, plus a £6K per annum fellowship support fund for travel/consumables/equipment.

To be eligible to apply, candidates should have a maximum of three years' postdoctoral experience at the closing date for applications and must not hold a permanent academic post. The proposed research must fall within the EPSRC mathematics programme remit. The fellowship must be held at a UK university or similar institute.

The closing date for applications is **13 October 2003**. For further information contact: Helen Carter, EPSRC, Polaris House, North Star Avenue, Swindon SN2 1ET (tel: 01793 444162; email: helen.carter@epsrc.ac.uk; website: www.epsrc.ac.uk).

POSTDOCTORAL FELLOWSHIPS FOR TRAINING IN THE LIFE SCIENCES

The Human Frontier Science Program (HFSP) has announced the latest call for applications for Long-term Fellowships to support postdoctoral training in basic research in the life sciences. Long-term Fellowships (LTF) provide three years of support for postdoctoral training abroad in a laboratory of the fellow's choice. The third year may be used either in the host laboratory or in the fellow's home country and Fellows who return home are eligible to apply for a Career Development Award. Applicants for the LTF program are expected to explore a new area of research. Scientists trained in other disciplines such as chemistry, physics, mathematics, computer science, and engineering are especially encouraged to apply for training in the life sciences. The next deadline for submitting letters of intent for the research grants is **4 September 2003**.

The International Human Frontier Science Programme (HFSP) is an international non-governmental non profit association devoted to the promotion of basic research focused on the elucidation of the sophisticated and complex mechanisms of living organisms.

The HFSP supports novel, innovative and interdisciplinary basic research focused on the complex mechanisms of living organisms; topics range from molecular and cellular approaches to systems and cognitive neuroscience. A clear emphasis is placed on novel collaborations that bring biologists together with scientists from fields such as physics, mathematics, chemistry, nanoscience, computer science and engineering to focus on problems at the frontier of the life sciences. Further information can be obtained from the web (www.hfsp.org).

ISAAC NEWTON INSTITUTE FOR MATHEMATICAL SCIENCES

Call for Proposals

The Isaac Newton Institute for Mathematical Sciences is a national research institute in Cambridge. It aims to bring mathematical scientists from UK universities and leading experts from overseas together for concentrated research on specialised topics in all branches of the mathematical sciences from pure mathematics, applied mathematics, and statistics, to engineering, computer science, theoretical physics and mathematical biology.

At any time there are two visitor programmes in progress, each with about twenty scientists in residence. Included within these programmes are periods of more expanded activity including instructional courses and workshops. Full details of the programmes so far completed and those currently running or confirmed for the future are on the website (www.newton.cam.ac.uk/programs/index.html).

The Institute now invites new proposals for programmes for 2006 onwards. A choice of six-month or four-month programmes is available. A short programme of four weeks duration is available during July/August each year. These short programmes are intended for more narrowly focussed topics or for subjects that may be at an embryonic stage of development, and for which a longer programme might not be as yet justified.

Proposals should follow the guidelines given in Submission of Proposals and be addressed to The Director, Sir John Kingman, Isaac Newton Institute for Mathematical Sciences, 20 Clarkson Road, Cambridge CB3 0EH.

Proposers should state whether they would prefer a four-month, six-month or four-week programme. The Institute is pleased to receive proposals at any time. The Scientific Steering Committee normally meets in April and October each year. Proposals for consideration at the next meeting (October 2003) should be received by **31 July 2003**. Further information is also available from The Director (email: info@newton.cam.ac.uk; tel: 01223 335999), who will answer any enquiries.

ROYAL SOCIETY SCIENTIFIC DISCUSSION MEETINGS

The Royal Society is soliciting proposals for the Society's scientific discussion meetings and for 'theme' issues of its journal *Philosophical Transactions*.

The Royal Society holds around 12 interdisciplinary scientific discussion meetings each year, which focus on new or rapidly changing science and technology. Any UK scientist is eligible to propose a discussion meeting. Scientific meetings are generally two days in duration where approximately 14 experts in an area of science or technology are invited to present

papers on the latest developments in the subject and to stimulate discussion among those attending (generally 100-300 participants). Interdisciplinary subjects are especially appropriate to the Society's programme and suggestions for subjects with economic and social implications are welcomed.

The closing date for receipt of returned forms for the 2003 selections process has been extended to **Monday 1 September 2003**. Meetings are selected 12-24 months in advance, so a proposal that is successfully chosen in November 2003 will result in a meeting between November 2004 and December 2005. An electronic copy of the proposal form and notes can be accessed at www.royalsoc.ac.uk/forms, or by contacting the Events Officer Suzi White (suzi.white@royalsoc.ac.uk).

BRITISH-ITALIAN PARTNERSHIP PROGRAMME 2003-2004

The British Council in Italy invites proposals for support under this programme to promote the development of British-Italian scientific cooperation between universities and public sector research institutes in Italy and the UK. It provides a contribution towards travel and living expenses, but does not cover research costs. The key objective of this programme is to focus on new or recently initiated collaborative links offering international experience to young researchers, with preference being given to projects which provide research-training opportunities, e.g. post-doctoral training in the partner country. Project coordinators and members of the research groups must be under the age of forty.

Among the areas in which proposals are sought is Grid Computing (defined by Dr John Taylor, Director General of UK Research Councils as "about global collaboration in key areas of science and the next generation of infrastructure that will enable it"). Proposals should focus on research into developing grid technology, grid standards and best practice in the use of grids.

The closing date for proposals is **18 July 2003**. For further information visit the website (<http://www.britishcouncil.it/eng/science/guidance.htm>).

NORTH-EASTERN POSTGRADUATE PURE MATHEMATICS WORKSHOP

The first North-Eastern Postgraduate Pure Mathematics one-day workshop for research students in pure mathematics (broadly defined) will be held at the University of York on Monday 28 July. The aim is to allow students to meet people with similar interests, broaden their awareness of pure mathematics, and gain experience of conference speaking in a relaxed environment.

Every student will have the opportunity (if they wish) to give a short talk on their research. There will also be a longer talk, on a generally accessible pure mathematical topic, by Professor Peter Cameron of Queen Mary, University of London. The workshop is supported by an LMS conference grant. For further details please contact Mark Kambites (mek100@york.ac.uk) or visit the website (www-users.york.ac.uk/~mek100/workshop/).

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 below.

Please note that the Society's income has fallen, and Programme Committee is not able to make awards as often or as fully as it would like.

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). 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 grants@lms.ac.uk or spoor@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) or the Administrative Officer, Frances Spoor (tel: 020 7291 9979), who will be pleased to discuss proposals informally with potential applicants and give advice on the submission of an application. For general information on completing your application please refer to the Notes for Guidance. For assistance please email grants@lms.ac.uk.

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.

In the case of satellite conferences, organisers of the main meeting are asked to give brief details of any planned satellites as part of their application for a conference grant.

Applications for support for satellite meetings should make clear the financial and organisational connection with the main meeting. This is particularly important in cases where the expenses of speakers could be shared between the two meetings. Special arrangements apply to the BMC and its satellites.

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. 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.
4. 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.
5. 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.
6. 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.
7. Applications should be brief and self-contained. Please do not append substantial documents that contain irrelevant detail or refer to websites for key information.
8. 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.

Scheme 1 - Conference Grants

Grants are made to the organisers of conferences to be held in the United Kingdom. Programme Committee tends to give priority to the support of meetings where an LMS grant can be expected to make a significant contribution to the viability and success of the meeting. The Society expects that the meetings which it supports will be open to all members of the Society, and will only support a closed meeting if an exceptional case is made. Support of larger meetings of high quality is not ruled out but for such meetings an LMS grant will normally cover only a modest part of the total cost. Potential applicants should note that the Society is reluctant to award grants to conferences which clash with other significant mathematical meetings in Britain such as the British Mathematical Colloquium or the British Applied Mathematical Colloquium.

The current upper limit for grants is £5,000, the size of the grant to take into account the length of the conference, the number of UK participants and the number of research students

taking part. The basic grant shall not normally exceed £3,000, with additional support available for research students (up to £1,000) and 'Scheme 5' participants (up to £1,000). The basic grant is primarily intended to cover the expenses of principal speakers.

Applicants should note that conference attendance will not be funded, except for principal speakers, research students, and 'Scheme 5' participants. Support here is intended to contribute to travel, accommodation and subsistence costs, but not registration fees.

The Society will not make grants to cover the cost of secretarial help, excessive room charges, publicity, or conference dinners and entertainment: it expects such items to be covered by contributions in kind from the host department, or by registration charges, or by income from other sources.

The Society wishes to support UK based research students, and applications should include details of the extent to which such research students will be involved in the conference. Up to £1,000 may be awarded to support participants who are research students at UK universities. (In this context 'research student' means 'research student of any nationality studying at a UK university'.)

The Society also wishes to encourage overseas participants from the former Soviet Union, Eastern Europe and other countries within the scope of Scheme 5 (see below); a further £1,000 may be awarded to support such participants.

These additional grants are intended to help widen participation in a meeting. The committee does not expect that all of these sums will necessarily be spent; any surplus must be returned to the Society and may not be used for other purposes. Academic and financial reports of the conference are expected.

Applications are considered at the September, February and June meetings of Programme Committee. Deadlines for receipt of applications for these meetings are 31 August, 31 January and 31 May.

Scheme 2 - Visitors

Some financial support is provided for visitors to the UK who give lectures in at least three separate institutions. Exceptionally, support under this scheme might be provided for a speaker addressing just one meeting which is regional in scope, but a special case would be required.

The LMS contribution under this scheme is towards actual expenses for travel (international and within the UK), accommodation and subsistence, up to a maximum of £1,200. The grant is only intended as a partial contribution and applicants are expected to approach the host institutions for funding to cover the remainder of these costs. Applicants are responsible for making all the arrangements for a visit under this scheme and are expected to make economical travel arrangements where possible, e.g. Apex air fare and 2nd class rail fare. A maximum of £50 a day is allowable for accommodation and subsistence according to the formula: actual accommodation costs up to £35 per day, £15 per day for other subsistence costs.

There are no specific deadlines but normally an application should be submitted at least three months before the date of the proposed visit to allow for consideration by the LMS Programme Committee and an announcement of the visit in the Society's Newsletter. Applications will not be considered between mid-June and mid-September.

Scheme 3 - Support of joint research groups

The scheme is to provide support for groups of mathematicians, working in at least three different locations in the United Kingdom, who have a common research interest, who wish to engage in collaborative activities and whose geographical locations are such that reasonably frequent regular meetings—several per year—are a realistic possibility.

The maximum grant awarded is currently £1,200; this is awarded where four meetings per year are held, or there is an equivalent level of activity. Meetings should be open, and have at least two formal talks on the programme. The grant is made for the academic year and the Society will expect to receive a report, both academic and financial.

A grant may be used for a variety of purposes associated with the group's activities, such as expenses for speakers at common seminars, travel for group members between institutions either for research visits, seminars or study groups, or support for TMR networks (on items ineligible for EU grants). The Society wishes to support research students and young postdoctoral mathematicians, and applications should indicate details of the extent to which they will be involved in the programme. No strict criteria will be laid down as to the use of the money but the Society reserves the right to judge whether the activities proposed in an application are appropriate for a grant.

Renewals

Applications for renewal should be made using an application form and be accompanied by full financial and academic reports. Programme Committee will normally either:

- a) renew at some appropriate level, or
- b) give notice of termination at the end of the calendar year, in which case a sum equal to not more than one third of the previous year's grant can be claimed to cover actual expenditure in the residual period.

In both cases, the application form should be completed by a nominated 'grant-holder', who will be responsible for the use of the grant, and countersigned by a 'supporter' from each of at least two further institutions. (If none of the applicants is a member of the Society, the application must be countersigned by a member of the Society.)

New and renewal applications are considered at the September meeting of Programme Committee. The deadline for receipt of applications for this meeting is 31 August. Renewal applications will also be considered at meetings between September and December, and should be submitted as soon as final reports can be completed.

Scheme 4 - Collaborative small grants

The aim of the scheme is to provide small grants to individual LMS members within the United Kingdom to help support a visit for collaborative research, either by the grantee to another institution within the UK or abroad, or by a named mathematician from within the UK or abroad to the home base of the grantee. The time available for joint research arising from the grant is expected to be several working days. The maximum sum available is £500 and, where necessary, grantees will have to cover further costs from other sources such as departmental or personal funds. The intention is to provide sufficient funds so that the call on other sources is held within manageable bounds.

Applicants should bear in mind that the purpose of the Scheme is to support specific projects with named collaborators and not, for example, simply to contribute to the costs of a sabbatical visit. A brief report on the use of the grant is expected: this should describe the academic outcome of the visit, together with very brief financial details.

Applications for a grant under this scheme may only be made by LMS members working in the UK. Applications are considered at the September, February and June meetings of Programme Committee. Deadlines for receipt of applications for these meetings are 31 August, 31 January and 31 May. Awards will be restricted to one in any given academic year (September to August) and in the event of over-subscription in any particular round, applicants who received an award in the previous academic year will not be considered.

Scheme 5 - International Short Visits

This scheme, originally to support mathematics in the countries of the former Soviet Union, has been extended to other countries. It now includes the countries of the former Soviet Union and Eastern Europe including the former Yugoslavia, China, India, Pakistan, Bangladesh, and the countries of Africa. It excludes the countries of Western Europe and North America and Australia. The status of other countries will be determined by Programme Committee case by case. For visits to Britain, the maximum grant shall be £1400, and up to £500 for travel. A maximum of £50 a day is allowable for accommodation and subsistence according to the formula: actual accommodation costs up to £35 per day, £15 per day for other subsistence costs. For visits from Britain, the maximum grant is £1200.

Success of an application will depend mainly and crucially on the likelihood of potential benefit to mathematics in the country concerned. Grants will not be made solely for attendance at conferences. Where a visit to or from the UK includes a conference, it should also include other academic activities which in themselves would justify the grant, and should be for a total period of not less than 14 days. For visits to the UK, any expenses during the period of a conference should be met by the conference organisers (see 'Conference Grants' above).

Applications for a grant under this scheme should be made by mathematicians at UK institutions, both for visits to the UK and for visits to the countries concerned. Applications are considered at the September and February meetings of Programme Committee. Deadlines for receipt of applications for these meetings are 31 August and 31 January.

Scheme 6 - Connectivity Grants

Up to £500 may be awarded towards the cost of exploring potential new collaborations between mathematicians and non-mathematicians on new applications of mathematics. The use of the grants is not restricted but might include the costs of a small-scale meeting to identify problems or travel costs to bring in external experts. The intention is to help the applicants do the preparatory work prior to a larger scale application to EPSRC. The application should be by short letter giving:

1. the names of at least two co-applicants, one a member of a mathematical science department and one a member of a non-mathematical department;
2. outline CVs of the two applicants;
3. a description of how the grant would be used;
4. the financial year (starting 1 September) in which you would wish to claim the grant.

Preference will be given to novel areas of application. Support for existing collaborations is not eligible.

If none of the applicants is a member of the Society then the application must be countersigned by a member. Applications are considered at the September, February and June meetings of Programme Committee. Deadlines for receipt of applications for these meetings are 31 August, 31 January and 31 May.

Grants awarded since November 2002

SCHEME 1

Applicant	Title	Grant
C.P. Rourke	BMC/BAMC 2002 (additional grant)	£3,000
J.M. Howie	Combinatorial and Computational Group Theory (additional grant)	£500
F.T. Smith	65th Birthdays of Professors S.N. Brown and M.E. O'Neill	£1,576
J.K. Truss	Groups and Model Theory, Leeds 2002	£2,560
D. Strauss	Groups and Semigroups in Analysis; a conference to mark the retirement of J.S. Pym	£2,500
M. Mathieu	Joint Meeting of 56th BMC and 17th Annual Meeting of the Irish Mathematical Society	£9,000
A.D. Scott	One-Day Meeting in Combinatorics	£1,400
N. Ray	18th British Topology Meeting	£4,958
A.C. King G.J. Sharpe	Modelling of Explosions and Reactive Flow	£600
N. MacKay	7th Informal UK Meeting on 2D Integrable Models and Conformal Field Theory	£500
I. Gordon	Scottish Algebra Day	£1,360
A.J.W. Hilton	Reading One-Day Combinatorics Colloquium	£400
L. Archer M. Wildon	5th Postgraduate Group Theory Conference	£2,300
K. Brown	Derived Categories and Applications	£4,600
M. Mathieu	Belfast Functional Analysis Day 2003	£1,000
R.W. Tucker	BRITGRAV III	£2,346
T. Poole	14th Postgraduate Combinatorial Conference	£1,288
M. Kambites	North-Eastern Postgraduate Pure Mathematics Workshop	£344
N.J. Higham	New Frontiers in Computational Mathematics	£1,200
R. Grimshaw T. Bridges	Structure and Stability of Interfacial Waves	£2,360
D.M. Evans	Group Theory and Combinatorics	£1,400
V.B. Kuznetsov	Workshop on Jack, Hall-Littlewood and Macdonald polynomials	£4,000
L. Cummings	Free Boundary Problems in Fluid Mechanics	£4,000
R. Dyckhoff	British Logic Colloquium 2003	£3,000
C. Athorne	ISLAND II: Geometry and Discrete Systems	£4,000
R. Halburd	Differential and Functional Equations in the Complex Domain	£3,000
J.M.N.T. Gray	Geophysical Granular and Particle-Laden Flows (INI Satellite Meeting)	£5,000
S.J. Hogan	46th European Study Group with Industry (ESGI)	£1,000
Y. Fu	Modern Mechanics and Mathematics - international conference in honour of Ray Ogden's 60th birthday	£3,000
M. Crossley	Intercollegiate Colloquium in Mathematics 2003	£1,768
D.B. Duncan	Computational modelling in medicine	£1,000
F. Mezzadri N. O'Connell N.C. Snaith	Random Matrices and Probability (INI Satellite Meeting)	£5,000
P.J. Giblin	BMC/BAMC 2005	£10,000
M. Dritschel	Workshop in Operator Theory and Its Applications	£3,000
A. Iserles	Geometric Integration of Differential Equations	£2,250
B.M. Brown	Fifth Gregynog workshop on Computational Techniques in Spectral Theory and Related Topics	£2,000

S. French D. Rickles	12th Foundations of Physics Conference	£500
A. Thomason	Combinatorics in Cambridge	£5,000

SCHEME 2

Applicant	Visitor	To Visit	Grant
J.R. Partington	D. Yakubovich	Leeds, Newcastle, Oxford	£325
E.V. Ferapontov	D. Korotkin	Loughborough, Oxford, Cambridge	£1,000
V. Liskevich	A. Skubachevskii	Heriot-Watt, Bristol, Bath	£500
H.R. Dullin	A.V. Bolsinov	Loughborough and two other institutions	£900
M.R. Bridson	R.H. Gilman	Imperial College, Newcastle, Warwick	£1,000
A. Ranicki	E.K. Pedersen	Leicester, Manchester, Edinburgh, Aberdeen	£450
W.D. Evans	R.A. Kerman	Sussex, King's, Birmingham	£1,200
X. Mao	L. Shaikhet	Strathclyde	£1,200
G. Roehrl	G. McNinch	Birmingham, Manchester, Imperial College	£1,050
J. Schröer	C. Geiss	Leeds, Oxford, Leicester	£1,200
M.V. Lawson	S.W. Margolis	Bangor, York, Newcastle	£856
V. Moroz	P. Zabreiko	Bristol, Bath, Swansea	£1,200
Y.V. Fyodorov	A.Y. Orlov	Brunel, Bristol, Warwick	£1,200
J.B. Griffiths	J. Podolsky	Loughborough and two other institutions	£1,000
R. Grimshaw	E. Pelinovsky T. Talipova	Loughborough and two other institutions	£1,200
I.G. Todorov	V.S. Shulman	QUB and two other institutions	£1,200
D. Applebaum	A. Bendikov	Nottingham Trent, Warwick, Imperial College	£556
A. Grigor'yan	L. Saloff-Coste	Imperial College, Cambridge, Oxford	£1,181
M. Ruzhansky	G. Lu	Imperial College, Edinburgh, Bristol	£1,200
M. Grinfeld	A. Friedman	Manchester, Edinburgh, Dundee	£700
J.R. Ockendon	V.V. Pukhnachov	Oxford, Heriot-Watt, Nottingham, Southampton	£1,200
M. Nazarov	V. Retakh	York, Leeds, Warwick	£1,200
J.D.M. Wright	J.K. Brooks	Reading, QMUL, Oxford	£1,150
E.V. Ferapontov A.V. Mikhailov	V. Sokolov	Leeds, Loughborough, Glasgow	£1,200
P. Ashwin	Y. Maistrenko	Exeter and two other institutions	£1,200

SCHEME 3

Applicant	Institution	Title	Grant
J.P.C. Greenlees	Sheffield	Transpennine Topology Triangle	£1,200
H.R. Dullin	Loughborough	East Midlands Mathematical Physics Seminar	£1,200
A. Fordy	Leeds	Classical and Quantum Integrability	£1,200
R.B. Hoyle	Surrey	Patterns, Nonlinear Dynamics and Applications (PANDA)	£1,200
N.M. Stephens	Goldsmiths College	Computational Number Theory (SECANTS)	£550

SCHEME 4

Applicant	Institution	Collaborator	Institution	Grant
G.R. Everest	East Anglia	P. Moree	Amsterdam	£500
K. Chen	Liverpool	P.J. Harris	Brighton	£460
Y. Kurylev	Loughborough	G. Besson	CNRS, Grenoble	£500
C.T.H. Baker	Manchester	E. Buckwar	Humboldt, Berlin	£500
M. van den Berg	Bristol	P.B. Gilkey	Oregon	£500
V.M. Rothos	Leicester	D.E. Pelinovsky	McMaster, Canada	£500
D.J. Silvester	UMIST	H. Elman	Maryland	£500
N.J. Ford	Chester	T. Diogo, P. Lima	Lisbon	£465
P. Rowlinson	Stirling	D. Cvetkovic, S.K. Simic	Belgrade	£500
V.C. Mavron	Aberystwyth	V.D. Tonchev	Michigan	£500
H.D. Macpherson	Leeds	D. Haskell	Paris	£350
R. Szabo	Heriot-Watt	J. Brodzki	Southampton	£500
T. Macko	Aberdeen	B. Williams	Notre Dame, Indiana	£450
B.D. Mestel	Exeter/Stirling	S.R. Bullett	QMUL	£500
S. Scott	King's College London	X. Dai	California	£500
E.V. Ferapontov	Loughborough	A.V. Aksenov	Moscow State	£500
W.J. Zakrzewski	Durham	M. Grundland	Montreal	£500
M. Mathieu	QUB	P. Ara	Barcelona	£285

SCHEME 5

Applicant	Visitor	Institution	To Visit	Grant
P.A. Clarkson	G. Filipuk	Belarusian State	Kent	£1,900
L. Bogachev	S. Zarbaliev	Russian Academy of Sciences	Leeds	£1,850
I.J. Siemons	V.B. Mnukhin	Taganrog, Russia & South Pacific, Suva, Fiji	East Anglia	£1,900
C. Smyth	A. Dubickas	Vilnius	Edinburgh, Cardiff, York	£1,536
J.D. Kaplunov	Y.A. Ustinov	Rostov	Manchester	£1,899
E.G. Rees	H. Feng	Nankai	Edinburgh	£1,200
A.A. Ivanov			Moscow	£950
S. Kuksin			Moscow State	

**NATIONAL E-SCIENCE CENTRE
Forthcoming Events**

7-8 July Formal Languages for Grid and Web Services (<http://umbriel.dcs.gla.ac.uk/NeSC/general/esi/events/253/index.html>)

14-17 July Portals and Portlets 2003 (<http://umbriel.dcs.gla.ac.uk/nesc/general/esi/events/261/>)

16-18 July Introduction to Bioinformatics

16-18 September Imaging, Medical Analysis and Grid Environments (IMAGE) (<http://umbriel.dcs.gla.ac.uk/NeSC/general/esi/events/image03/>)

16-17 October Grids and Applied Language Theory (GALT 03) (<http://umbriel.dcs.gla.ac.uk/nesc/general/esi/events/273/index.html>)

For further information visit the web (<http://umbriel.dcs.gla.ac.uk/NeSC/general/esi/events/>).

MODERN MECHANICS AND MATHEMATICS

An international conference on Modern Mechanics and Mathematics in honour of Ray Ogden's 60th birthday is to be held at Keele University from 28-30 August. The conference organizers cordially invite all those who either know Ray personally, or know his research, to gather in Keele to mark this important occasion. It is hoped that this conference will also act as a forum to discuss recent developments in various aspects of solid mechanics, especially in the theory of nonlinear elasticity and its many applications. The topics of the conference cover all fields of solid mechanics, including, but not restricted to

- Bio-mechanics/materials
- Bifurcation/buckling, phase transitions, super-conductivity and shape memory alloys
- Contact and fractural mechanics, composite materials
- Simulations/modeling in nano-mechanics/materials and micro-electro-mechanical systems (MEMS)
- Finite deformation field theory, linear and nonlinear wave propagation
- Buckling problems and heat transformation in thin-film mechanics/materials
- Plastic limit analysis, design and shakedown theory, soil-rock mechanics
- Computational mechanics, numerical models and algorithms.

A special issue of the *IMA Journal of Applied Mathematics* will be published after the conference. Deadline for submission of papers is **1 October 2003**. For further information contact Professor Yibin Fu, Department of Mathematics, Keele University, (email: y.fu@keele.ac.uk) or visit the website (www.keele.ac.uk/depts/ma/ogden).

COMBINATORICS IN CAMBRIDGE

A conference on combinatorics, and on the interface between combinatorics and analysis, will be held in Cambridge between 4 and 7 August. The meeting will mark the 60th birthday of Professor Béla Bollobás.

Around thirty lectures will be given, by speakers including Noga Alon, Keith Ball, József Beck, Christian Borgs, Jennifer Chayes, Alan Frieze, Tim Gowers, Svante Janson, Gyula Katona, Jeong-Han Kim, Alexandr Kostochka, Nati Linial, László Lovász, Tomasz Łuczak, Vitali Milman, Boris Pittel, Hans-Jürgen Prömel, Miklós Simonovits, Vera Sós, Endre Szemerédi, Carsten Thomassen, Dominic Welsh and Peter Winkler.

Further details are available on the conference website (www.dpmms.cam.ac.uk/belabash). All are welcome, and registration should be made as soon as possible. Applications are especially encouraged from UK research students, for whom some financial support is available (courtesy of the London Mathematical Society and the British Combinatorial Committee.)

BRITISH WOMEN IN MATHEMATICS DAY

What sounds like it should have been discovered by a female mathematician, but wasn't? A Julia set. These fractals and their dimensions were the subject of our first talk on 6 May, by Gwyneth Stallard. It seemed to me a rather appropriate topic, although not because of the name.

Instead, it is another example of lateral thinking, thinking outside the box. Let me explain. For those mathematicians first trying to find ways to define the idea of dimension of a fractal (for example the coastline of Britain) the standard notions of length and area failed to fit. How could a curve of seemingly infinite length fit in a finite area? Of course, the answer is that we define dimension by another method, and fractals have non-integer dimension between 1 and 2.

Why was this appropriate for the occasion? It is one example of where it helps to use a continuum model rather than a stark choice between length and area: not black and white but several shades of grey. It is not men and women who do mathematics, but people, and we are all different.

One advantage of getting a crowd of women together to listen to each other present research is that we see the differences more than the similarities. Claudia Yastremiz's work as a quantitative analyst in the City is a world away from Katie Chicot's research into transitive linear orders, both in the nature of their employment and in mathematical flavour. Put them together and we see that they are not merely both female mathematicians but people doing very different jobs. When women form a tiny minority in a university department or at a conference, there is the danger that we group or are grouped together as similar people when in fact there is little in common.

So I welcome the freedom that the annual Women's Day brings - not to be female, but to be myself. Another welcome experience is the chance to discuss ideas with people outside my department and outside my field, in a supportive and friendly setting. These range from the necessarily female issues such as when to take maternity leave to the problems faced by all young researchers: what should I do? and how? and where? and when? Dinner at Pizza Express was a great way of winding down after the formal talks, enabling us to talk more freely about our concerns.

Alice Rogers deserves our hearty thanks for organising the day; the staff at De Morgan House did their usual fantastic job of supplying us with coffee and salmon sandwiches. I very much enjoyed all the speakers' talks - no shoddy presentation skills or dimmed enthusiasm here! Apart from those mentioned, we welcomed Ursula Martin's discussion of her career move into computer science and saw short presentations of the research of four other researchers and PhD students as well as those of Katie and myself (on generalizations of Dehn surgery in 3-dimensional topology). Thanks therefore also to Rachel Long, Alexandra Tyurina, Alex James and Katerina Kaouri, speaking on number-theoretic lattice reduction, undular bores in fluids, the chemistry of beetles, and characteristics of the secondary sonic boom.

This diversity of interest is really the crucial insight I take away each year: we are not all the same. There is no such thing as a woman's area of mathematics, and no single feminine way that we tend to study what we like. Instead, all of mathematics lies open to each individual, and it is up to each of us to pursue those aspects which intrigue us most.

Vivien Easson (Oxford)

BOOK REVIEW

Such Silver Currents: The Story of William and Lucy Clifford 1845-1929 by M. Chisholm, Lutterworth Press (www.lutterworth.com), pp 208, £17.50, ISBN 0718830172.

William Kingdon Clifford died at the age of 33 in 1879. He left behind a mathematical legacy in geometry and algebra that lives on both under his own name (as in Clifford algebras, Clifford's theorem for Riemann surfaces, Clifford-Klein space forms etc.) and also those of others (the Hopf fibration and the Dirac operator). Even that remarkable output formed but a part of his short life's work for, after seven years in Cambridge spent evolving from an Anglo-Catholic into a radical humanist, he engaged in series after series of public lectures where he advanced his newfound philosophy with missionary zeal, preaching that "truth and right are to be got at by free enquiry and the love of our comrades for their own sakes and nobody else's". Thus he trod from the Dialectical Society to the Republican Society, the Royal Institution to the Sunday Lecture Society ... and he also made room, or at least so one supposes, for the London Mathematical Society where for a period he was a member of Council. Clerk Maxwell, writing a reference for Clifford for a Chair at UCL, perhaps best summed up his works, saying that "... they tend not to the elaboration of abstruse theorems by ingenious calculations, but to the elucidation of scientific ideas by the concentration on them of clear and steady thought". And it seems he tried to live his life that way too.

The book under review traces out the significant parts of this mayfly existence, but does so in parallel with that of his wife, Lucy Clifford, who outlived him by 50 years. They married in 1875; he died only four years later, but she never remarried. Yet paradoxically her eternal widowhood became a way of life which led her to become very close to an extraordinary number of literary figures who clearly enjoyed her company immensely. William used to sign off his letters to her with an agnostic "be free" instead of "goodbye" and in a sense that is what she tried to be, while never shaking off her devoted memories of him. She earned her keep (for despite a subscription for her and her daughters after William's death she needed to work) as a literary correspondent for *The Standard* and a gossip columnist for *The Athenaeum* (which later became the *New Statesman*). Both Cliffords had earlier moved in literary circles, in particular through the acquaintance of George Eliot, but now as a critic, a hostess and an author in her own right, Lucy formed friendships with Rudyard Kipling, Bernard Shaw, Henry James, Oliver Wendell Holmes and many others, all carefully described in the chapters of the book. She formed enemies too – clearly Virginia Woolf could not stand her, and regarded her merely as a gossip, and in old age as a relic from another century.

The author of *Such Silver Currents* has no such aversion to Lucy Clifford, and the production of the book is obviously a labour of love. Her sympathy with the main character makes her occasionally less than objective, but she has put in an enormous amount of work to produce this volume and paints a believable picture of the talented couple. In fact, the book grew out of a series of presentations of the world of the two Cliffords given in 1995/96 by Monty and Roy Chisholm beginning in the University of Kent and going onto the Isaac Newton Institute and elsewhere. These were lectures on the mathematical, literary and historical aspects of their lives, accompanied by an exhibition of photographs. Those who participated in the meetings, as I did, learned a great deal from them. I personally was unaware of the breadth of Clifford's interests until I read the *Collected Works*.

The book deals with the mathematics in two ways. The first account is influenced by Roy Chisholm's liking for Clifford analysis, an attempt to construct a higher-dimensional version of complex analysis, but the chapter also discusses in some detail Clifford's geometrical thinking about the possible curved structure of space. The second is a more personal reflection by Roger Penrose which includes the role of Clifford parallels in twistor theory and his own diagrammatic notation for invariants which Clifford seems to have invented 75 years earlier. But intriguingly, Penrose's favourite is the pure plane geometry of Clifford chains –

the incidence properties of the circles that pass through triples of points of intersection of a configuration of lines. This result still has a modern charm and the interested reader can see an interactive version on the web (www.cut-the-knot.org/Curriculum/Geometry/CliffordChain.shtml) where a nice proof of the theorem by Morley (which seems to owe more to Lagrangian interpolation than geometry) can be found.

Lucy Clifford's work unfortunately has had a less enduring appeal. While her plays, novels and short stories were often at the time controversial in content they now hardly merit a footnote in the history of Victorian literature. It is Lucy's life which dominates the book, but it is William's work that survives. Does that say something about mathematics or about us mathematicians?

Nigel Hitchin
University of Oxford

MIDLANDS REGIONAL MEETING

The third LMS Midlands Regional Meeting took place on 14 May 2003. This was the first time the Society has held a Regional Meeting at Coventry University and as hosts we were rather nervous. In the event it was much enjoyed.

The first speaker was Olaf Wolkenhauer from UMIST, but about to move to a chair at Rostock, who spoke on "Mathematical Modelling of Cellular Dynamics". Understanding what makes cells change their behaviour is an important area of current research. The approach here discussed using block diagrams as a starting point and explained that the reaction of biologists to any discrepancies between the model and the actuality was to suggest putting in another feed-back loop. The particular cells referred to belong to the bacterium streptomyces (which produces the nice smell in the air after rain). Questions afterwards covered a range of topics, including applying both possibility theory and category theory to these problems.

In contrast Robert Babuska from Delft gave a lecture on "Fuzzy Systems", explaining how generalised logic systems work and how the T-S Rules of Inference for neuro-fuzzy control systems are used. One application mentioned concerned the sizes of particles in industrial detergents. If these are too small they blow away and if they are too big they clog machinery. (Robert's talk at the subsequent Workshop on Uncertainty Modelling discussed applying these Rules of Inference to the design of combine-harvesters, where the motor is sometimes just driving the thing along and at other times is harvesting, and the engine needs to adjust accordingly. The results of this are to be tried out on combine-harvesters in Belgium this summer.)

After the talks there was a reception and a meal in the Lanchester Restaurant, named after Frederick Lanchester of motor-car fame, who dabbled in every science, including mathematics (in particular what we would call Operational Research).

Helen D. Robinson

RECORDS OF PROCEEDINGS AT MEETINGS

REGIONAL ORDINARY MEETING

held on *Wednesday 14 May 2003* at the University of Coventry. About 30 members and visitors were present for all or part of the meeting.

The meeting began at 3:30 pm, with Professor A.J. SCHOLL, FRS, in the Chair. Eight people were elected to Ordinary Membership: C.F. Braven, V. Gelfreich, M.J. Luczak, A.E. Parker, A.E.A. Rose, G. Sanguinetti, P.M. Topping and K.A.M. Wendland; and eight people were elected to Associate Membership: H.D. Burton, R.J. Clarke, M.J. Craven, M. Fayers, G.H. Hitching, A. Macrina, S.J. Weekley and D.M. Winterbottom.

The Records of the Proceedings of the Society Meetings held on 25 November 2002 and 28 February 2003 were signed as a correct record.

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

DR N. STEELE introduced a lecture given by O. Wolkenhauer on 'Mathematical Modelling of Cellular Dynamics'.

Dr N. Steele introduced a lecture given by R. Babuska on 'Fuzzy Systems'.

Professor Scholl expressed the thanks of the Society to the University of Coventry and the speakers for putting on such an excellent meeting.

A reception was held in the Department of Mathematics. This was followed by a dinner at the Lanchester Restaurant, University of Coventry.

LTSN INDUCTION COURSE

This induction course is aimed at academic staff who have started teaching mathematics, statistics or operational research in UK higher education institutions within the last three years, whether they are new graduates or coming from industry or from outside the UK. In the past, attendance has been recognised as contributing towards introductory institutional programmes in learning and teaching for new staff (certificated or otherwise).

The course will take place on Thursday 18 and Friday 19 September in the School of Mathematics and Statistics in the University of Birmingham, with accommodation within easy walking distance at Mason Hall. It will start with an afternoon session on the Thursday and finish at lunchtime on the Friday. Lunch will not be provided, but there are various restaurants and snack bars on campus. The cost of the course is £75 including an evening meal and overnight accommodation. Contact Jenny Nolan, LTSN Mathematics, Statistics & OR Network, The University of Birmingham, Edgbaston, Birmingham B15 2TT (tel: 0121 414 7095, e-mail: info@mathstore.ac.uk) or use the online form (<http://ltsn.mathstore.ac.uk/workshops/induction2003>). Bookings should be confirmed by post with payment in advance. Cheques for £75 per delegate should be made out to the University of Birmingham.

LONDON MATHEMATICAL SOCIETY AND EDINBURGH MATHEMATICAL SOCIETY JOINT MEETING

Tuesday 22 July 2003, Edinburgh

As part of the International Centre for Mathematical Sciences (ICMS) conference 'Hodge Theory in a New Century' the London Mathematical Society and the Edinburgh Mathematical Society are jointly hosting an afternoon of more general talks likely to be of interest to a broad range of mathematicians.

- 14.00 Introduction: LMS/EMS Business
- 14.15 **Michael Atiyah:** *Sir William Hodge – the man and the mathematician*
- 15.15 **Roger Penrose:** *Mathematical experiences as a Cambridge research student under William Hodge*
- 16.00 Tea
- 16.45 **Fritz Hirzebruch:** *Hodge numbers, Chern numbers, Catalan numbers*
- 17.30 Finish

A conference banquet will take place in the Playfair Library on Tuesday 22 July (at 19.30 for 20.00) and will cost around £30.

The meeting will be held in the Michael Swann Building in the University of Edinburgh's Kings Buildings (entry via Gate 4 on Mayfield Road).

All are welcome and there is no charge for attendance. It is, however, necessary to reserve a place, either by completing the online form on the website (www.ma.hw.ac.uk/icms/meetings/2003/HODGE/LMS-EMSmtg.html) or by contacting ICMS, 14 India Street, Edinburgh EH3 6EZ (tel: +44 (0)131 220 1777; fax: +44 (0)131 220 1053; email: icms@maths.ed.ac.uk).

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

**LONDON MATHEMATICAL SOCIETY
SOUTH WEST AND SOUTH WALES
REGIONAL MEETING**

Nonlinear Dynamics

**University of Southampton
24 October 2003**

The South West and South Wales Regional Meeting of the London Mathematical Society will be held on Friday 24 October. The speakers are Marcelo Viana (IMPA, Brasil) and Philip Holmes (Princeton).

This will be followed by a weekend (25-26 October) workshop on *Nonlinear Dynamics and the Life Sciences*. The speakers include:

Peter Ashwin (Exeter)	Stefano Luzzatto (Imperial College)
Tsuyoshi Chawanya (Osaka)	David Rand (Warwick)
Philip Holmes (Princeton)	Ian Stewart (Warwick)
Tim Lewis (NYU)	Marcelo Viana (IMPA)

There are limited funds available to contribute in part to the expenses of members of the Society or research students to attend the 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).

For further details contact David Chillingworth, tel: 02380 593677, email: drjc@maths.soton.ac.uk .

Daphne Jackson Research Fellowship

Sponsored by the London Mathematical Society

Applicants are invited to apply for a half-time Research Fellowship under the auspices of the Daphne Jackson Trust*. The Fellowship will be sponsored by the London Mathematical Society.

The Daphne Jackson Trust helps talented women scientists, engineers and technology specialists to return to work after a career break by offering half-time, sponsored Fellowships in research laboratories throughout the UK. Since its inception, the Trust has appointed over 100 Fellows, most of whom have resumed a promising career in their chosen field.

Each Fellowship aims to provide advanced research and training opportunities for a well-qualified woman (research scientist, engineer or technology specialist) with a PhD or good honours degree, seeking to resume her career after a minimum three-year break to meet family commitments.

The Fellowship is tenable in a science, engineering or technology department or related institution at University of the applicant's choice. Applicants must prepare a proposal for a research project in conjunction with an accredited supervisor. The successful applicants will be elected to a Research Fellowship at their chosen institution for the tenure of their appointment.

The appointment will be for two years, half time. (The stipend will be pro rata on the RA1A scales for research staff, amounting to a minimum of £9,840 per annum plus £850 extraordinary expenses in the first year.) There is a facility for additional support from a special discretionary fund administered by the Daphne Jackson Trust.

For more information contact:

The Fellowship Administrator, The Daphne Jackson Trust,
Department of Physics, University of Surrey, Guildford, Surrey GU2 5XH.
Tel: 01483 689166
Email: djmft@surrey.ac.uk
Useful websites: www.daphnejackson.org and www.lucy-cav.cam.ac.uk

* Registered as the Daphne Jackson Memorial Fellowships Trust, Charity No. 1009605

TOPICS IN ALGEBRAIC GEOMETRY

LMS/EPSRC Short Course

University of Bath, 15-19 September 2003

Organiser: G.K. Sankaran

Algebraic geometry occupies a central place in modern pure mathematics, with connections to number theory, theoretical physics and differential geometry in particular. For example, elliptic curves and modular curves play vital roles in arithmetic; startling advances in the theory of higher-dimensional varieties and moduli spaces have emerged from, and contributed to, physics; and the theory of real 4-manifolds has similarly interacted with complex algebraic surfaces. One of the most influential problems for computer algebra has been to carry out explicit calculations in algebraic geometry.

Within algebraic geometry, there has been great progress over the last few years. The study of algebraic varieties of dimension three and more, initiated by Mori and others in the 1970s, has reached an advanced stage. Major results have been proved in enumerative geometry, especially on moduli spaces. The geometric meanings contained in resolutions of ideals (syzygies) have been much better explained and can be applied very directly, often with computer assistance.

In part because of its many connections, algebraic geometry is often seen as being hard to learn, and is left in the hands of specialists. This course will try to broaden the appeal of the subject by presenting three different topics at a level suitable to graduate students in algebraic geometry but in a style accessible to those working in related fields.

The course will take place at the University of Bath, within easy reach of the city of Bath.

There will be three courses of lectures:

- **Vector bundles:** **Dr Peter Newstead (Liverpool)**
- **Abelian varieties:** **Dr Gregory Sankaran (Bath)**
- **Higher-dimensional geometry:** **Dr Alessio Corti (Cambridge)**

There will be tutorial support for the courses, and workshops on other related topics. Further details of the programme may be found at www.bath.ac.uk/~masgks/ShortCourse.

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 departments from the EPSRC Doctoral Training Account that is paid to universities with each studentship award.

Application forms may be obtained from Isabelle Robinson, London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HS (robinson@lms.ac.uk) or from the LMS website (www.lms.ac.uk/activities/research_meet_com/short_course/16_app.html).

Numbers will be limited and those interested are advised to make an early application.

The closing date for applications is **Monday 8 July 2003**.

DERIVED CATEGORIES IN ALGEBRA AND GEOMETRY

LMS/EPSRC Short Course

University of Warwick, 1 – 5 September 2003

Organiser: D. Rumynin

The notion of derived category has originated in homological algebra and algebraic topology in an attempt to formalize the theory of cohomologies. It has allowed conceptual understanding of certain cohomological phenomena such as the De Rham theorem. By now, derived categories have become an essential tool for mathematicians working in algebra, algebraic geometry, representation theory and algebraic topology.

The course is intended for graduate students working in various areas of mathematics who need to use or want to learn the machinery of derived categories.

The course will take place at the University of Warwick.

There will be three courses of lectures:

- **Derived Categories of Modules:** **Jeremy Rickard (Bristol)**
- **Ring Theory and Homological Algebra:** **Amiram Braun (Haifa)**
- **Derived Categories of Coherent Sheaves:** **Alastair King (Bath)**

There will be tutorial support for the courses, and workshops on other related topics as parts of Warwick symposium on Noncommutative Algebra and its Applications. Further details of the programme may be found on the website (www.maths.warwick.ac.uk/~rumynin/na.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 departments from the EPSRC Doctoral Training Account that is paid to universities with each studentship award.

Application forms may be obtained from Isabelle Robinson, London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HS (robinson@lms.ac.uk) or from the LMS website (www.lms.ac.uk/activities/research_meet_com/short_course/17_app.html).

Numbers will be limited and those interested are advised to make an early application.

The closing date for applications is **Friday 18 July 2003**.

UMTC

**Undergraduate Mathematics
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**THE TWENTY-NINTH ANNUAL
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A working conference to improve the design and delivery of the
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The University of Birmingham
1 – 3 September 2003

Guest Speakers:

Professor Cliff Beevers OBE
Director of the CALM Project for Computer Aided Learning in
Mathematics and Co-Director of the Scottish Centre for Research into
On-Line Learning and Assessment, Heriot-Watt University

Professor Chris Budd
Professor of Applied Mathematics at the University of Bath
and Chair of Mathematics at the Royal Institution of Great Britain

Further details at
www.umtc.ac.uk/umtc2003
Dr Neil Gordon, Conference Chair (chair@umtc.ac.uk)
Dr Dirk Hermans, Local Organiser (info@umtc.ac.uk)

ANNUAL ELECTIONS TO LMS COUNCIL

The normal way in which nominations to Council are now made is via the Nominating Committee, but there is still provision for any member of the Society to make nominations directly. Anyone who wishes to propose someone for a position as an Officer of the Society or as a member of Council is invited to inform M.J. Taylor, who is currently chairing the Nominating Committee (martin.taylor@umist.ac.uk) or one of the other members of the Committee (C.A. Hobbs, N.J. Hitchin, M.A.H. MacCallum, U. Martin, E.G. Rees, D.M. Sloan, J.F. Toland). Any direct nominations should be sent to the General Secretary (Professor N.L. Biggs, Department of Mathematics, London School of Economics, Houghton Street, London WC2A 2AE, n.l.biggs@lse.ac.uk) to arrive before noon on **1 September 2003** such nominations must bear the signatures of the Nominator and three Seconders and of the Nominee.

P.R. Cooper
Executive Secretary

(nb This item arrived too late for the July 2003 Newsletter so was included as an insert.)

Separate one page item: Jack, Hall-Littlewood and Macdonald Polynomaisl Workshop

ALFRED GEORGE GREENHILL DE MORGAN MEDALLIST 1902

Alfred George Greenhill received the De Morgan Medal on 13 November 1902. A large proportion of his research work was occupied with elliptic functions and their applications to dynamics, hydrodynamics, theory of elasticity, electrostatics and conduction of currents. The design running through the multifarious papers which he wrote on these topics was to make the elliptic functions a familiar and trusted resource for completing the solution of problems that require them. He received the honour of Knighthood in 1908 on his retirement as Professor of Mathematics at Woolwich, a post which he had held for more than thirty years.

DIARY

JULY 2003

28 North –Eastern Postgraduate Pure Mathematics Workshop, York University (317)

AUGUST 2003

4-7 Combinatorics in Cambridge, Cambridge University (317)

29-30 Modern Mechanics and Mathematics Conference, Keele University (317)

SEPTEMBER 2003

1-3 Undergraduate Mathematics Teaching Conference, Birmingham University (317)

1-5 Derived Categories in Algebra and Geometry, LMS/EPSCR Short Course, Warwick University (317)

Correction: (add -6)

SEPTEMBER 2003

3-6 British Logic Colloquium, St Andrews University (316)

Change (316) to (317)

July 2003

22 LMS/Edinburgh Mathematical Society Joint Meeting, Hodge Centenary, Edinburgh University (317)

September 2003

15-19 Topics in Algebraic Geometry, LMS/EPSCR Short Course, Bath University (317)