THE LONDON MATHEMATICAL SOCIETY

London Mathematical Society

NEWSLETTER

Forthcoming Society Meetings

2007

Friday 20 April
Midlands Regional Meeting
Loughborough
Y. Colin de Verdière
M. Gross, F. Kirwan
O. Viro [*page 5*]

Tuesday 24 April
LMS-IMA David Crighton Lecture
London
E.C. Zeeman
[*page 16*]

Wednesday 30 May
SW and South Wales Regional Meeting,
Cardiff
M. Aizenman
T. Sunada
[*page 19*]

Friday 22 June
London
A. MacIntyre
H. Woodin

Wednesday 24 October
Northern Regional Meeting, Sheffield

Friday 23 November
AGM, London

NEXT STEPS INITIATIVE

A meeting of the Next Steps Initiative (NSI) group took place on 24 January. Papers for and against the concept of a Fellowship grade had been commissioned but the case against was not yet complete, so discussion was held over. A revised version of the *Vision and Mission* statement was received and some modifications were agreed. The Royal Society's mission document and forward strategy was noted as a way of representing the Mission under a set of areas with a more extended description of those areas. It was agreed to revise the format of the Mission along these lines, but that it should not be unduly extended. The current final bullet point (efficient management of the society's resources for the advancement of mathematics) was important to members and must not be lost.

A paper based on the discussion at the last meeting concerning *Constitution* concluded that, of the four 'Constituencies' (learned activities, external policy and promotion, education, professional affairs), probably only the Learned Activities Committee (and possibly the Professional Affairs Committee)

should nominate members directly to Council.

The following points arose.

(a) 'Constituencies' represented activity areas rather than defined groups of members from particular sectors.

(b) A two-thirds majority should be required at both Council and a General Meeting in order to change the Regulations relating to the structure of and election to Council.

(c) There was a significant difference between the two societies in the make-up and operation of their Nominating Committees – this would require further consideration. It was later agreed that papers outlining the two systems will be brought to the next meeting.

(d) The LMS had a ballot even for unopposed positions, while the IMA's Officer positions are filled by nomination by Council.

(e) There were different views on whether all, some or just one Constituency Committee should nominate members direct to Council. On the one hand, direct nomination enabled a democratic process to take place (through the elections to the Constituency Committees) while still ensuring

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an overall balance on Council between the Constituency areas; on the other hand, it might prove impossible to find sufficient candidates willing to stand for election for some Constituencies (especially if on a previous occasion they had not been elected). There were also concerns that differences in the process between the Constituencies could lead to perceived differences in their status.

(f) Co-opted members benefited the operation or responsibilities of Council by allowing Council to bring in special skills or balance to the representation. Co-option must be optional and never more than 10% of the total membership.

(g) All elections would be using Single Transferable Vote and allow electronic voting.

(h) Publications were currently incorporated into the Learned Activities area, but there were special aspects to current publishing activities that meant that there should be effective direct representation on Council. It may be that one of the Learned Activities representatives on Council should be specifically to represent publishing. There would, in any case, need to be a Publications Committee on which both the Treasurer and the Vice-President (Learned Activities) sat.

The following model emerged:
• A President
• A Treasurer and a General Secretary.
• 4 Vice-Presidents – one for each Constituency (and chairing the relevant Constituency Committee), proposed by the Constituency Committee for approval by the membership.
• 2 member places per Constituency (a total of 8) – nominated by the four Constituency Committees for approval by the membership. If any Constituency Committee was unable to field sufficient candidates then the remainder would revert to the 'Other members' category.
• 7 Other members – more to stand than there were places, for election by the membership.
• Up to 2 or possibly 3, co-opted members – proposed and appointed by Council.

This would give a Council of 22–25 members.

The President should normally serve for two years, but this could be extended in exceptional cases for a further year. Other Officers and Vice-Presidents should serve for five years with a possibility of one further term of three or five years.

The legal structure and operation of the 'Hardy Fund' was considered. The following points were agreed.

(a) The Hardy Fund would be better named 'The Learned Activities Fund' for the time being.

(b) It should be established as a Designated Fund, so as not to tie the future society forever more. It would be under the control of Council but any change in the constitution of the Fund, its management or use must be subject to a two-thirds majority vote at a Council meeting.

(c) The societies would exchange a memorandum of understanding on the use and protection of the Learned Activities Fund before the establishment of a new unified society.

The membership of the next three theme groups, who should work to produce first draft reports for the next meeting, was agreed.

1. Public benefit (including services to mathematics, education and public engagement) – Nigel Steele, Alice Rogers, Nick Woodhouse

2. Support for research – David Abrahams, Peter Grindrod, Brian Davies, Dorothy Buck

3. Communications – Charles Evans, Charles Goldie, Dan Tilley

The remaining three themes are to be addressed later this year, preferably by the summer.

4. Finances and financial structures

5. Publishing

6. Administration

It was agreed that Charles Evans and Charles Goldie should be asked to give consideration to more proactive and interactive forms of communication with the memberships, to try to engage them in the issues and thinking of the group.

Charles Evans (IMA)
Charles Goldie (LMS)

Comments sought

As described above, the NSI group is developing a model that if implemented would lead to the replacement of both the Institute of Mathematics and its Applications and the London Mathematical Society by a new society.

As this work progresses, members are invited to send views directly to the NSI group and can be assured that all comments received will be brought to the attention of the group at its next meeting. Although the NSI group does not guarantee to reply to all messages it may on occasion choose to do so.

The email address to use is nsicontact@btinternet.com.

PROGRAMME COMMITTEE
Change of Deadline for Schemes 1-5 and pressures on Scheme 1

1. Please would all applicants to Schemes 1 to 5 note that the deadline for applications to be considered at the June meeting of Programme Committee has been brought forward to **24 May**, a week earlier than previously advertised.

2. Programme Committee at its last meeting saw a huge and unprecedented flood of applications for Scheme 1 grants. The Committee is doing its best to respond and Council has made additional funds available to compensate in part, but applicants for Scheme 1 should be aware that the success rate in Scheme 1 has dropped significantly and may drop further.

S.A. Huggett
Programme Secretary

MATHEMATICS POLICY ROUNDUP

There has been encouraging news for mathematics from UCAS, the university admissions body. Applications for courses in the mathematical sciences starting in September are up 10% on last year, making mathematics one of the top 20 most popular subjects for prospective students. UCAS figures revealed 33,790 applications for mathematics courses by January this year, showing a continuing recovery in interest following the dramatic slump after the introduction of AS-levels in 2000. The new figures demonstrate a healthy 37% increase in applications since 2004, although there is still concern that actual student numbers are still to match those seen ten years ago.

Less encouraging was news that the government has cut £68 million from the science budget for this spending review period. The Engineering and Physical Sciences Research Council was most heavily hit, with a £29 million reduction in funds (see page 11). There is concern that this could affect the success rate of responsive mode applications for grant funding and for postgraduate training, since the Council has promised to honour any financial commitments it has already made.

The EPSRC has also launched a consultation directed at the mathematical sciences community. It aims to address the way that Doctoral Training Grants are allocated. It is asking for comments on proposed Key Performance Indicators that might be used in future review panels to ensure that the whole process is both transparent and consistent. It closes at the end of April. A CMS group containing representatives of all three societies is preparing a response.

The Charity Commission launched a consultation on guidance to be given to charities in respect of what constitutes 'public benefit'

and the criteria the Commission will use to assess whether a charity meets the requirement. As a registered charity with membership criteria, the LMS will have to ensure that it can fulfil these criteria. It is planning to work with the Science Council and the Foundation for Science and Technology in responding to the consultation.

The LMS responded to a letter from the government's Women and Work Commission asking for comments on its report on women in the workplace, *Shaping a Fairer Future*. The response highlighted the ongoing concern of the society for women in mathematics, from numbers of young women studying mathematics post-16 through to the drop-off in women in higher posts in universities, especially between the ages of 30 and 40. It outlined LMS measures to address this, including the Women in Mathematics Committee, the Mary Cartwright lecture and the childcare funds available to help women attend conferences. It called for pressure on grant-giving organisations to allow recipients to be extended *pro rata* when the holder works part time.

The newly formed Maths Promoters network held its first event on 9 March. Participants from across the mathematics community came to hear about what the *more maths grads* project will do and to think about how their organisation will work with the project. Helen Orr, project manager for *more maths grads*, described her vision for the project and what it would deliver, whilst Teresa Smart and Elizabeth Webster gave the viewpoint of the National Centre for Excellence in the Teaching of Mathematics and how it would work with the project.

Caroline Davis
Mathematics Policy and
Promotion Officer

LONDON MATHEMATICAL SOCIETY

MIDLANDS REGIONAL MEETING

Room W001, Sir David Davies Building, Loughborough University

Friday 20 April 2007

10:30 – 10:45	**Arrival; poster display**
10:45 – 12:00	**LMS business meeting** **Frances Kirwan** (Oxford) *Non-reductive group actions and symplectic implosion*
12:00 – 13:30	**Lunch**
13:30 – 14:30	**Yves Colin de Verdière** (Grenoble) *On localisation of Laplace eigenfunctions: recent progress and open problems*
14:30 – 15:00	**Tea and coffee**
15:00 – 16:00	**Oleg Viro** (St Petersburg) *The 16th Hilbert problem: a story of mystery, mistakes and solution*
16:00 – 17:00	**Mark Gross** (UC, San Diego) *Affine geometry, tropical geometry, and mirror symmetry*
17:00 – 18:30	**Wine reception**
18.30	**Dinner**

Students are invited to make poster demonstrations of their work for display at the meeting. A book prize from Springer will be awarded for the best poster. Interested students should contact the organisers. For further details or to reserve a place at the dinner, contact the organisers or visit the website www-staff.lboro.ac.uk/~margh/conferences/LMS-07.

There are funds available to contribute to the expenses of members of the LMS or research students to attend the meeting and workshop. Requests for support can be expressed by contacting the organisers: Rod Halburd (R.G.Halburd@lboro.ac.uk), Alexander Veselov (A.P.Veselov@lboro.ac.uk) and Alexey Bolsinov (A.Bolsinov@lboro.ac.uk).

The meeting will be followed by a workshop from 21-23 April on *Tropical Geometry*. The confirmed speakers include E. Feichtner, V. Fock, I. Itenberg, G. Mikhalkin, M. Passare, B. Siebert and A. Szenes. For further information visit www-staff.lboro.ac.uk/~margh/conferences/LMS-07/tropical/.

THE CMS DIARY

The CMS met in De Morgan House on 14 February. Sir David Wallace welcomed several observers to the meeting: Colin Campbell (President, Edinburgh Mathematical Society) and Jeff Griffiths (President, Operational Research Society) had been invited to attend following a discussion of the CMS' future development in November 2006. The Chair also welcomed Alice Rogers, who was attending as the new ACME observer, and Nigel Steele, who attended to present his report on the regional provision of mathematics departments.

Others present were: David Abrahams (President-Designate, IMA), Peter Cooper (Executive Secretary, LMS), Brian Davies (President-Designate, LMS), Jon Forster (RSS), Ivor Goddard (Director General, RSS), David Hand (President Elect, RSS), Tim Holt (President, RSS), Tim Pedley (Past President, IMA), Martin Smith (Secretariat, CMS), John Toland (President, LMS) and David Youdan (Executive Director, IMA).

The CMS Bologna Group's final report mentioned in the last diary entry had been circulated to the Physics, Chemistry and Engineering societies and other bodies. The meeting noted replies from these organisations, which included their responses to the recent Select Committee Inquiry into the Bologna Process. There were some significant differences between their submissions, particularly in relation to sustainability of the integrated masters courses as a second cycle qualification.

The Bologna Group's report had indicated that resolving the issue of second cycle funding was critical to the successful implementation of the Process; however, a response to a letter sent to Bill Rammell (Minister of State for Lifelong Learning, Further and Higher Education, DfES) stated that the Minister 'did not think that now was the right time to review the current funding arrangements'.

This was disappointing. The CMS will be looking at how it can work with other bodies in the science community to press this issue further, and present a stronger and more coherent voice on other aspects of the Bologna Process.

Nigel Steele presented his report on the regional provision of mathematics departments and courses in the UK, explaining that whilst areas of heavy population appeared to be well catered for there were, for example, areas in the east of England and in Wales that were not so well covered. The issue will be explored further, and the concept of 'accessibility' developed to span social as well as geographic and academic factors. The CMS plans to take these and other current issues forward with the relevant bodies, and seek meetings with policy-makers as appropriate.

The meeting noted media releases from both ACME and the CMS in relation to the new two-GCSE format for mathematics. ACME had stated that there should be a national expectation that all students who achieve at least National Curriculum Level 6 at Key Stage 3 (currently almost 60%) should be entered for both qualifications. The CMS release supported ACME's statement, and went on to stress the importance of ensuring that all schools should offer both GCSEs, or else risk limiting their pupils' future success in many sectors. It is essential that these changes do not result in fewer pupils being adequately prepared for mathematics post-16, both for the government to meet its Science and Innovation Framework targets and in order to support the economic tower that is built on the UK's outstanding mathematical achievements. The CMS received some coverage of its statement on the BBC News website at http://news.bbc.co.uk/1/hi/education/6322367.stm. The CMS-EPSRC liaison group will be discussing the measures being taken to absorb the £29M cut to EPSRC's budget (see page 11).

The CMS next meets on 22 May 2007.

Martin Smith
CMS Secretariat

JAMES EELLS

Jim Eells died on 14 February after a long illness. He had been a member of the LMS since 1970, and was awarded a Senior Berwick prize in 1992.

Born in 1926 in Cleveland, Ohio, his exuberance led to expulsion from high school. However he graduated from Bowdoin College in 1948. He then spent a year as an instructor at Robert College (now Boğaziçi University) Istanbul, followed by Instructorships at Amherst College, and Tufts University, while working for his 1954 PhD at Harvard under Hassler Whitney. After two years at the Institute for Advanced Studies, Princeton, the first of several visits, he went to U.C. Berkeley as an assistant professor. He returned to the East Coast after two years, first to Columbia University and then to a Professorship at Cornell in 1964. This was the year of his classic article with J.H. Sampson *Harmonic Mappings of Riemannian Manifolds*, founding harmonic map theory.

In 1969 he became the first Professor of Analysis at Warwick. This brought new areas of mathematics to Britain especially through his Warwick Symposia *Global Analysis* 1971-72 and *Geometry of the Laplace Operator* 1976-77. His interest in mathematics and mathematicians worldwide included active sympathy with the difficulties of Third World mathematicians. He took the first Symposium to the Trieste International Centre for Theoretical Physics, an organisation aiming to assist third world scientists, for the first session held there on Mathematics. This was the initial move in the development of a Mathematics Division at ICTP, of which he became the first Director from 1986 to 1992. He retired from Warwick in 1992, moving to live in Cambridge, where he had spent 1963-4 and 1966-7. His work on harmonic maps continued, including a monograph with Fuglede published in 2001.

He lived to know that the main subject he pioneered, geometric evolutions, has been the tool for proving the Poincaré Conjecture, as he forecast around 40 years ago. Other pioneering work includes infinite dimensional manifold theory, especially his description of the differential structure on path spaces in 1958 and foundational work on geometric stochastic analysis.

David Elworthy writes: Jim Eells had a phenomenal memory for people, matched by an interest in them. It has been claimed that in his early days he could recognise every member of the American Mathematical Society. His wife Nan became well known to the younger researchers especially, and their families, due to her friendship and splendid dinner parties, with only mild attempts to control the exuberance of her husband. With Jim came tremendous mathematical excitement combined with an intensity of fun. He is missed a lot.

YORKSHIRE AND DURHAM GEOMETRY DAY IN MEMORY OF JIM EELLS

A one-day meeting to commemorate the work of Jim Eells will be held at the University of Leeds on Friday 11 May as part of the Yorkshire and Durham Geometry Day series. Jim was a Senior Visiting Professor at Leeds after his retirement from Warwick. Talks will be given by four of his former students: John C. Wood, Paul Baird, Fran Burstall and Luc Lemaire. The meeting will start with coffee in the School of Mathematics at 10.30. Talks will take place from 11.00 to 17.00; the final talk being a survey on the work and influence of Jim Eells by Lemaire.

After the meeting, an early dinner will be organized at a local restaurant; some of Jim's family hope to be present. It would be appreciated if you could please inform John C. Wood (j.c.wood@leeds.ac.uk) if you wish to attend this.

Yorkshire and Durham Geometry Days are supported by an LMS Scheme 3 grant. For more information, contact John C. Wood or see www.maths.leeds.ac.uk/pure/geometry/ydgd/ where there are links to the full schedule and travel information. There is a Workshop on *Integrable Systems* adjacent to this meeting: see www.maths.leeds.ac.uk/cnls/research/integrable/ cqi/cqi.html.

INVITATION FOR EARLY CAREER RESEARCHERS

NESTA (the National Endowment for Science, Technology and the Arts) is looking for 30 early career researchers from across disciplines to join its Crucible programme, which is designed to encourage innovative interdisciplinary collaboration. They are looking for researchers from the fields of science, technology, mathematics, medicine and engineering who also have an interest in how science interacts with society. Successful applicants will be invited to attend three weekend residential meetings with respected speakers, facilitated break out groups, seminars and skills sessions. NESTA will cover residential costs including travel and childcare.

For further details contact Dr Rachel Brazil at crucible@nesta.org.uk or see www.nesta.org.uk/crucible Closing date for applications is **30 April**.

NEWS FROM ICMS

The International Centre for Mathematical Sciences (ICMS) is pleased to welcome a new face. Irene Moore joined the team as Executive Secretary and Centre Manager in January 2007. She has an extensive background in management gained in Adult Education and Business Training in Cambridgeshire. Irene steps in to the space vacated by Tracey Dart when she took up her new post at the School of Geosciences at the University of Edinburgh.

Also new at ICMS is the completely redesigned website. In addition to the main workshop programme pages, there is a new calendar feature which lists all public events (e.g. seminars and associated meetings) hosted at ICMS. There is an archive about ICMS projects past and present, which will grow as we collect and collate the content, and instructions on how to propose an ICMS workshop. Visit www.icms.org.uk to have a look around.

The current workshop season began in March with workshops on *Mathematical modelling and analysis of cancer invasion of tissues* and *Smoothing-based and Gaussian-process-based methods for non-parametric regression in environmental problems*. The ICMS will be holding the following workshops during the remainder of 2007:

- *Geometry and Algorithms:* 16–21 April icms.org.uk/workshops/geomalg
- *Applying Geometric Integrators:* 24–27 April icms.org.uk/workshops/appgeomint
- *Statistical Methods for Genetic Epidemiology:* 7–11 May icms.org.uk/workshops/statgenep
- *Mathematical Theories of Abstraction, Substitution and Naming in Computer Science:* 26–28 May icms.org.uk/workshops/maththeoCS
- *Cherednik Algebras:* 18–22 June icms.org.uk/workshops/cheralg
- *Number Theory and Computability:* 25–30 June icms.org.uk/workshops/numtheocomp
- *Further Developments in Quantitative Finance:* 9–13 July icms.org.uk/workshops/quantfin2
- *Optimal Transportation, and Applications to Geophysics and Geometry:* 16–20 July Web: icms.org.uk/workshops/optransgeo
- *Mathematical Virology:* 6–10 August icms.org.uk/workshops/mathvir
- *The Riemann-Hilbert Problem and Toeplitz Operators:* 3–7 September icms.org.uk/workshops/toepop

WOMEN IN MATHEMATICS DAY 2007

The next Women in Mathematics Day will be held on **27 April** at De Morgan House. Sessions will include talks by practising women mathematicians in a variety of appointments and at different career stages.

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. It is hoped that an opportunity to see women who are active and successful in mathematics, and to meet them informally will be beneficial. Feedback from previous meetings has shown that participants find this useful. While this is an occasion particularly for women active in mathematics to get together, men are certainly not excluded.

Any postgraduates, postdocs or research assistants interested in giving a talk or presenting a poster during the afternoon session should contact Dorothy Buck (d.buck@imperial.ac.uk) by 15 April.

Draft Programme

10.30-11.00	**Registration and coffee**
11.00-12.45	**Morning Session**
	Professor Caroline Series (Warwick)
	Continued Fractions and Hyperbolic Geometry
	Professor Nancy Nichols (Reading)
	The Weather Modelling Problem
	Dr Sarah Waters (Nottingham)
	Mathematics in Medicine and Biology
12.45-13.45	**Lunch**
13.45-15.30	**Afternoon Session**
	Postgraduate/Postdoc speakers
15.30-16.30	**Tea and Poster Session**

Followed by an early evening meal for those able to stay.

Limited funds are available to help with the travel costs of students attending the event. Further details are available from Isabelle Robinson at the Society (contact details below).

To register please contact Isabelle Robinson, Administrative Officer (robinson@lms.ac.uk). The day is free for students and £5 for all others – payable on the day.

NEWS FROM THE EPSRC MATHEMATICAL SCIENCES PROGRAMME

Reduction to EPSRC funding
Some of you may be aware of the very unfortunate news regarding EPSRC's funding position. This has come about because the DTI has agreed with Treasury that some funds will need to be found from within the Science Budget in order to meet financial pressure elsewhere within the DTI. The EPSRC contribution to this will be £29M. Further details can be found at: www.epsrc.ac.uk/PressReleases/ReductionToFunding.htm. The RCUK response and details of impacts on other research councils can be found at: www.rcuk.ac.uk/news/20070221 budget.htm. We are now assessing the impact that this announcement will have on funding of research and postgraduate training in the engineering and physical sciences in the UK. The forthcoming Council meeting in March will consider options to find the necessary savings and remain within its financial allocation. We will provide you with updates as and when they are available and any impact on the Mathematical Sciences Programme will be reported in future email newsletters.

Early Career Academics Workshops
The mathematical sciences team is currently planning a series of regional workshops during May and June in Glasgow (14–15 May), Manchester (13–14 June) and London (26–27 June). These events will provide researchers in the early stages of their career with a unique opportunity to discover more about how EPSRC works, to meet the members of the Mathematical Sciences team in an informal setting and to challenge perceptions of EPSRC and future careers. The events will run from lunch time to lunch time and include a series of exercises, challenges and games designed to demystify EPSRC. More details and invitations will follow soon. For more information contact Mark.bambury@epsrc.ac.uk.

DTG Review
The Mathematical Sciences Programme allocates its Doctoral Training funds primarily through a peer review panel. Although there are no plans to change this process it was thought timely to review it, especially in light of the concerns raised by the International Review of Mathematics and some concerns raised by the Mathematical Sciences community, specifically regarding a lack of transparency. A group of academics from the Mathematical Sciences community, most of whom had chaired previous Doctoral Training Allocation panels, were invited to discuss the current process for allocating funds and to consider Key Performance Indicators that might be used in future review panels to ensure that the whole process is both transparent and consistent. The document is a report on their discussions. EPSRC invites the community to provide feedback on the proposed criteria, particularly with regard to how they will be developed in order to measure many of the Key Performance Indicators. Contact Dr Caroline Batchelor (caroline.batchelor@epsrc.ac.uk) for further information or with your responses by no later than **30 April**.

European Framework Programme 7
FP7 is the short name for the Seventh Framework Programme for Research and Technological Development. This is the EU's main instrument for funding research in Europe and it will run from to 2013. The EC budget for the next seven years is €50.5 billion and the Euratom budget for the next five years is €2.7 billion. FP7 supports research in selected priority areas – the aim

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being to make, or keep, the EU as a world leader in those sectors. FP7 is made up of four main blocks of activities forming four specific programmes plus a fifth specific programme on nuclear research:

- **Cooperation** – Collaborative research (Health; Food, Agriculture and Biotechnology; Information and Communication Technologies; Nanosciences, Nanotechnologies, Materials and new Production Technologies; Energy; Environment (including climate change); Transport (including Aeronautics); Socio-economic sciences and Humanities; Security; Space)
- **Ideas** – European Research Council (Frontier research actions)
- **People** – Human Potential, Marie Curie actions (Initial training of researchers – Marie Curie Networks; Life-long training and career development – Individual fellowships; Industry-academia pathways and partnerships; International dimension – outgoing and incoming fellowships, international cooperation scheme, reintegration grants; Excellence Awards)
- **Capacities** – Research capacities (Research infrastructures; Research for the benefit of SMEs; Regions of Knowledge; Research Potential; Science in Society; Support to the coherent development of research policies; Specific activities of international cooperation)
  There are also the areas of EURATOM (€2.7 billion) and JRC (€1751 million)
- Nuclear research and training (Fusion energy – ITER; Nuclear fission and radiation protection)
- Joint Research Centre (Direct actions in Euratom; Non-nuclear actions)

Established by the Office of Science and Innovation, FP7UK is here to help prospective applicants to access funding under the EU's Seventh Framework Programme. Its aim is to provide a single, centralised, one stop shop for information and advice, covering all aspects of FP7. Details of all FP7 schemes and how to apply can be found on the FP7UK website: www.fp7uk.dti.gov.uk.

Public Communication Training Funds (PCTF) on research grants
There have been a number of enquiries about the current situation with researchers asking for PCTF on grants now that we operate in an FEC world, so this is a quick note for clarification. PCTF can still be requested on all research grants, but they will no longer be simply given at £500 if the grant is successful. Instead, applicants will need to ask for the amount of money that they would like to be used for training related to public communication/engagement. (There is no need to identify or book a particular course as this may vary depending on the requirements of whoever it is that wants the training.) Applicants will need to justify the request in the Justification of Resources with a short explanation of why they are asking for the amount of money requested (they do not need to justify the need for the training as it may not be clear who will use the training funds at this stage).

The Public Engagement pages on our website have further information, including a list of course providers that can be used (although it is not necessary to use someone from this list, but it is a good starting point for those who don't already know of any public communication training providers.) Further details can be found by contacting Dr Joanna Coleman (joanna.coleman@epsrc.ac.uk).

For a full list of current calls visit the website: www.epsrc.ac.uk/CallsForProposals/ or for details of the Mathematical Sciences Programme visit: www.epsrc.ac.uk/ResearchFunding/Programmes/Mathematical Sciences.

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VISITS

G.H. GOLUB

Professor Gene H. Golub (Stanford University) will be visiting the UK from 8 April for most of the summer. He is an expert in Numerical Analysis and in particular in Numerical Linear Algebra. Professor Golub will be giving various talks around the UK to include:
• 10 May, University of Strathclyde
• 15 May, University of Manchester
• 23 May, University of Leicester
as well as Birmingham, Oxford and Reading Universities. He is an invited speaker at the Biennial Dundee Numerical Analysis Conference in the last week of June.

For further information contact Andy Wathen at Oxford University Computing Lab (wathen@comlab.ox.ac.uk). This visit is supported by an LMS Scheme 2 grant.

J.B. GREENBERG

Professor Barry Greenberg (Technion, Israel) is currently visiting the UK, based at the School of Mathematics, University of Manchester. Professor Greenberg has wide experience in the mathematical modelling of combustion phenomena. His research activities include spray combustion, numerical combustion, fire safety and also the behaviour of composite structures. During his visit Professor Greenberg will lecture on the approximate dates:
• 25 April, University of Manchester, contact Joel Daou (J.Daou@manchester.ac.uk)
• 2 May, University of Leeds, contact John Brindley (J.Brindley@leeds.ac.uk)
• 9 May, Cranfield University, contact Barrie Moss (J.B.Moss@cranfield.ac.uk)
• 16 May, University of Brighton, contact Sergei Sazhin (S.Sazhin@bton.ac.uk)
Further information can be found at www.mims.manchester.ac.uk/visitors/b-greenberg or contact Professor John Dold (dold@manchester.ac.uk). This visit is partly funded through an LMS Scheme 2 grant.

W. KAUP

Professor Wilhelm Kaup (University of Tübingen) will be visiting Queen Mary, University of London from 27-30 April (host Professor C-H. Chu), Oxford from 1-5 May (host Dr C.M. Edwards) and Aberdeen from 6-9 May (host Professor J.D.M. Wright). Professor Kaup will lecture on *Geometric and functional analytic structures derived from symmetric complex Banach manifolds* as follows:
• 30 April at 16.30, Mathematics Seminar Queen Mary, University of London
• 1 May at 17.00, Room L3, Mathematical Institute, Oxford
• 8 May at 17.15, Room 302, Meston Building, University of Aberdeen
For further information contact Martin Edwards, The Queen's College, Oxford OX1 4AW (martin.edwards@queens.ox.ac.uk). This visit is supported by an LMS Scheme 2 grant.

J. RAMAGGE

Professor Jacqui Ramagge (University of Wollongong, Australia) will be visiting the Universities of East Anglia, Newcastle and Warwick from 18 April–4 May. Professor Ramagge will give three lectures on *A totally disconnected perspective on Kac-Moody groups* as follows:
• Geometry and Algebra Seminar, 19 April at 4:00 pm, Department of Mathematics and Statistics, University of Newcastle
• Algebra Seminar, 26 April at 2:00 pm, Mathematics Institute, University of Warwick
• Pure Mathematics Seminar, 30 April at 2:30 pm, School of Mathematics, University of East Anglia
For further details contact Dr Inna Korchagina, Mathematics Institute, University of Warwick via email (I.Korchagina@warwick.ac.uk). This visit is supported by an LMS Scheme 2 grant.

TONY PANTEV

Professor Tony Pantev (University of Pennsylvania) will be visiting the UK during May. He is well known for his work on complex algebraic geometry, Hodge theory and mathematical physics related to string theory. Professor Pantev will give the following lectures:
• Mathematical Institute, Oxford, 1 May 2:15–3:15 *Generalized Hodge Structures and Mirror Symmetry* (Algebraic Geometry Seminar, Room SR2)
3:45–4:45 *Homological Mirror Symmetry for Del Pezzo Surfaces* (Homological Mirror Symmetry Seminar, Room L3)
• Maxwell Institute for Mathematical Sciences, Edinburgh, 4 May 2:30–3:30 and 4.00–5.00 *Langlands Duality for Hitchin Systems* (Geometry and Topology Seminars)
• Mathematics Department, University of Glasgow, 9 May 3:00–4:00 *Generalized Hodge Structures and Mirror Symmetry* (Geometry and Topology Seminar, Room 214)
For further information contact Dr Elizabeth Gasparim (Elizabeth.Gasparim@ed.ac.uk). This visit is supported by an LMS Scheme 2 grant.

A. RODKINA

Professor Alexandra Rodkina (University of the West Indies, Jamaica) will be visiting the Universities of Strathclyde, Glasgow and Edinburgh from 23 May – 6 June. Professor Rodkina is an expert on stochastic analysis. Her research interests include stability, stochastic control, numerical analysis, etc. During her visit, she will give talks on stochastic stability, stabilisation and their applications.

For more detailed information contact Professor Mao, Department of Statistics and Modelling Science, University of Strathclyde, Glasgow G1 1XH or email: xuerong@stams.strath.ac.uk. This visit is supported by an LMS Scheme 2 grant.

J. SCHERER

Professor Jerome Scherer (UAB Barcelona) will be visiting the Universities of Leicester, Manchester and Sheffield from 8–17 May. Professor Scherer will give three lectures on *Deconstructing Hopf spaces* as follows:
• Pure Maths Colloquium, 9 May at 4:00 pm, Room J11, Hicks Building, Department of Pure Mathematics, University of Sheffield
• Geometry Seminar, 10 May at 4:00 pm, Room G.16 Newman Building, School of Mathematics, University of Manchester
• Pure Mathematics Colloquium, 14 May at 5:00 pm, MA119, Michael Atiyah Building, University of Leicester
Hopf spaces were introduced in the 1950s by Serre in order to understand Lie groups from a homotopical point of view. For further details of the visit contact Dr Frank Neumann, Department of Mathematics, University of Leicester via email at: fn8@mcs.le.ac.uk. This visit is supported by an LMS Scheme 2 grant.

London Mathematical Society

POPULAR LECTURES

This year's lectures will take place in London on Thursday 12 July and in Birmingham during September. The lecturers will be:

• **Dr Stephen Huggett** (University of Plymouth) *Knots*
• **Dr Hinke Osinga** (University of Bristol) *Chaos and Crochet*

Once details are finalised, they will appear on the LMS website (www.lms.ac.uk).
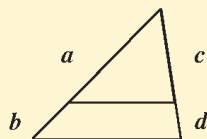
The London Mathematical Society

THE INSTITUTE OF MATHEMATICS AND ITS APPLICATIONS

The David Crighton Lecture
Professor Sir Christopher Zeeman, FRS

Tuesday 24 April 2007 at 5 pm
followed by a reception

Royal Statistical Society, 12 Errol Street, London EC1Y 8LX

What's wrong with Euclid Book V

Book V has long been considered to be the greatest achievement of Euclidean geometry. But Euclid forgot to define the ratio of two ratios leading to serious strategic consequences for Greek mathematics. In his lecture, Sir Christopher will introduce a new axiom to re-establish the propositions of Book V.

Before the lecture, Professor Sir Christopher Zeeman will be presented with the David Crighton Award. This is a medal awarded triennially in recognition of service to both mathematics and the mathematical community. It is co-sponsored by the London Mathematical Society and the Institute of Mathematics and its Applications.

Admission to the lecture is by ticket only. For tickets, please contact Susan Oakes at the LMS (oakes@lms.ac.uk or De Morgan House, 57-58 Russell Square, London WC1B 4HS) by **Monday 16 April**. Tickets are free of charge and will be allocated on a first come first served basis.

LOW DIMENSIONAL GEOMETRY AND TOPOLOGY WARWICK SYMPOSIUM

Symposium Workshops
- *3-manifold geometry and topology:* 9–12 July Organisers: Marc Lackenby and Daryl Cooper
- *David Epstein 70th Birthday Celebration:* 13–14 July Organisers: Vlad Markovic and Caroline Series
- *Hyperbolic structures on 3-manifolds and large scale geometry of Teichmüller space:* 16–21 July Organisers: Javier Aramayona, Brian Bowditch and Caroline Series
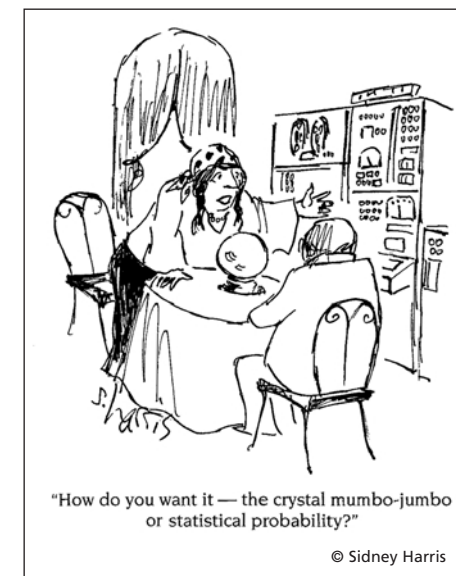
Warwick Workshops
- *Multiscale methods* LMS-EPSRC Short Course: 16-20 April Organiser: Andrew Stuart
- *Partial differential equations and fluid mechanics:* 21-23 May Organisers: James Robinson and Jose Rodrigo
- *Large quantum systems:* 11-15 June Organisers: Daniel Ueltschi and Roman Kotecky
- *Conformal structures and dynamics. The current state-of-art and perspectives* Opening conferences of EU Research Training Network CODY: 11-15 June Organisers: Feliks Przytycki, Sebastian van Strien and Michel Zinsmeister
- *Mathematical challenges in quantum chemistry problems:* 16-20 July Organisers: Volker Betz and Gero Friesecke
- *Real analysis, geometric measure theory, PDE and Banach spaces:* 17-21 August Organiser: Keith Ball, Marianna Csörnyei (University College) and Roman Kotecky
- *Turbulence collaborators:* 17-19 September Organiser: Sergei Nazarenko
For further information on these and other events see: www.maths.warwick.ac.uk/events.html or contact: Mathematics Research Centre, Zeeman Building, University of Warwick, Coventry CV4 7AL (email: mrc@maths.warwick.ac.uk, tel: +44 (0)24 7652 8317, fax: +44 (0)24 7652 3548).

MOTIVES, QUADRATIC FORMS AND ALGEBRAIC GROUPS

An LMS Workshop on *Motives, Quadratic Forms and Algebraic Groups* will be held from 27–31 August at Queen's University Belfast. The workshop is planned to bring together experts, young and old, on various aspects of research in Chow motives, quadratic forms and algebraic groups, as well as graduate students, postdocs and others who wish to learn about the subject areas. The courses will be on:
- *Motives and quadratic forms:* N. Karpenko (Jussieu)
- *Quadrics and birational geometry:* B. Totaro (Cambridge)
- *Motivic cohomology:* C. Weibel (Rutgers)
For further information contact R. Hazrat (r.hazrat@qub.ac.uk) or visit the website: http://queensworkshop.googlepages.com.

"How do you want it — the crystal mumbo-jumbo or statistical probability?"

© Sidney Harris

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POSITIVITY V

The fifth conference on *Positivity and its Applications* will be held in the Department of Pure Mathematics, Queen's University of Belfast, from Monday 23 to Friday 27 July inclusive. It will be preceded on Saturday 21 and Sunday 22 July by an Instructional Workshop aimed at postgraduate students and postdoctoral researchers who are new to this area. A special issue of the journal *Positivity* has been reserved for refereed articles based on talks given at this conference.

The conference is supported by the London Mathematical Society, the Irish Mathematical Society and the Pure Mathematics Department of Queen's University. The generosity of the two societies allows the organisers to offer possible financial assistance to post-graduate students from both the United Kingdom and the Republic of Ireland and also to any participant from the former Soviet Union or from Africa. The funds available are limited and will only be used to off-set expenses actually incurred. Further details may be found at www.qub.ac.uk/Positivity.V (case is important) and registration may be completed online.

ERGODIC THEORY

A two day meeting on *Ergodic Theory* will be held at Warwick University on Thursday 17 and Friday 18 May, dedicated to the memory of Professor William Parry, FRS. The meeting will take place in the Zeeman Building (Mathematics Department), with talks beginning at 11:30 am and with coffee available from 10:00 am. The international speakers will include:
- Hillel Furstenberg (Jerusalem)
- Klaus Schmidt (Vienna)
- Jean-Paul Thouvenot (Paris)

Professor Furstenberg is co-recipient of this year's Wolf prize. Anyone interested is welcome to attend. Further details can be obtained from Mark Pollicott (mpollic@ maths.warwick.ac.uk) or Peter Walters (pw@maths.warwick.ac.uk) or from the website www.maths.warwick.ac.uk/~mpollic/ ergodictheory.html. There will be a dinner on the Thursday evening. The conference is supported by an LMS conference grant.

PSEUDO HERMITIAN HAMILTONIANS IN QUANTUM PHYSICS

The 6th international workshop on *Pseudo Hermitian Hamiltonians in Quantum Physics* will be held from 16–18 July at City University, London.

The topics the organisers wish to cover are non-Hermitian and pseudo-Hermitian quantum mechanics and quantum field theory, (C)PT-symmetry in non-Hermitian systems, numerical methods for solving non-Hermitian spectral problems, supersymetric non-Hermitian systems, Lie algebraic and Krein space methods, Moyal products and non-Hermitian systems, integrability and exact solvability of non-Hermitian systems, dissipative systems, random matrix models and non-Hermiticity. The Invited Speakers are:
- Carl Bender (Washington University)
- Patrick Dorey (Durham University)
- Thomas Curtright (University of Miami)
- Hendrik Geyer (University of Stellenbosch)
- Joshua Feinberg (University of Haifa)
- Ali Mostafazadeh (Koc University)
- Michael Ogilvie (Washington University)
- Roberto Tateo (University of Turin)
- Miloslav Znojil (Rez Nuclear Physics Institute, Prague)

The early registration fee up until 10 May is £30 and the late registration fee, which finishes 23 June is £60. The workshop organizers are: Andreas Fring (City University) and Hugh Jones (Imperial College). Further information and a registration form are available at: www.staff.city.ac.uk/~fring/PT/. The conference is supported by an LMS conference grant.

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LONDON MATHEMATICAL SOCIETY

SOUTH WEST & SOUTH WALES REGIONAL MEETING

Faculty Lecture Theatre (Room T209) Trevithick Building, Cardiff University

Wednesday 30 May 2007

3.00 pm LMS business meeting

> **Michael Aizenman** (Princeton)
> *The curious effects of disorder on spectra of random operators*

4.15 pm Tea

5.00 pm Toshi Sunada (Meija University, Japan)
> *Perturbation techniques in discrete geometric analysis*

There will be a reception and dinner afterwards. For registration, further details and to reserve a place at the dinner see the webpage www.cs.cf.ac.uk/newton/newton2.html or contact Ms M. Mills (MillsME@cardiff.ac.uk).

The meeting will take place during a workshop from 29 May – 1 June on *Analysis on Graphs and its Applications*. The workshop will be devoted to the problems arising at the interfaces of number theory, combinatorics, discrete groups, random walk theory, fractal theory, as well as mathematical physics and spectral geometry. Particular areas addressed will include spectral theory on graphs, amenability of discrete groups, zeta-functions on graphs, and analysis on fractals.

There are funds available to contribute to the expenses of members of the LMS or research students to attend the meeting and workshop. Requests for support can be expressed on the on-line registration form. For information on scientific questions contact T. Sunada (sunada@math.meiji.ac.jp) or P. Kuchment (kuchment@math.tamu.edu) or for information on organisational matters contact M. Marletta (MarlettaM@cardiff.ac.uk).

SINGULARITY THEORY

A *Singularity Theory* conference in celebration of Terry Wall's 70th birthday will take place at the University of Liverpool from Wednesday 4 to Friday 6 July. The speakers are:
- Jean-Paul Brasselet (Marseille)
- James Damon (Chapel Hill)
- Javier Fernandez de Bobadilla (Madrid)
- Sabir Gusein-Zade (Moscow)
- Maxin Kazarian (Moscow)
- Eduard Looijenga (Utrecht)
- David Mond (Warwick)
- Andras Nemethi (Columbus)
- Adam Parusinski (Angers)
- Joseph Steenbrink (Nijmegen)
- Duco van Straten (Mainz)
- Wim Veys (Leuven)

Accommodation will be in the Carnatic Halls of Residence at the university. There will be a conference dinner on Thursday 5 July. For more information and to register, visit the website www.liv.ac.uk/~pjgiblin/wall70/Twelcome.htm. The conference is supported by an LMS conference grant and by the Division of Pure Mathematics in the Department of Mathematical Sciences at the University of Liverpool.

REPRESENTATION THEORY OF *p*-ADIC GROUPS

A conference on the *Representation Theory of p-adic Groups* will be held at King's College London, from 6-8 June, on the occasion of Colin Bushnell's 60th birthday. The conference will cover the theory of representations (over any field) of *p*-adic groups, the theory of types, harmonic analysis, and applications to number theory. The invited speakers will include:
- P. Broussous (Poitiers, France)
- J.-F. Dat (Paris Nord, France)
- G. Henniart (Orsay, France)
- P. Schneider (Münster, Germany)
- V. Sécherre (Marseille, France)
- F. Shahidi (Purdue, USA)
- M. Taylor (Manchester, UK)
- M.-F. Vignéras (Paris 7, France)
- E.-W. Zink (Berlin, Germany)

For further information contact the organisers: D. Burns, King's (david.burns@kcl.ac.uk), P. Kutzko (Iowa) and S. Stevens, UEA (Shaun.Stevens@uea.ac.uk) or visit the website www.mth.kcl.ac.uk/research/numbtheo/padic2007/. The conference is supported by an LMS conference grant for the participation of UK-based PhD students, and is an official event of the EU network *Arithmetic Algebraic Geometry*.

PROBABILITY, STATISTICS & FINANCIAL STOCHASTICS

A workshop on *Recent Advances in Probability, Statistics & Financial Stochastics* will take place from 31 May – 2 June at Middlesex University, MUBS, The Burroughs, London NW4 4BT. The organisers plan to bring together leading specialists in Probability, Statistics and Financial Stochastics. Topics include (but not limited to):
- self-normalised sums and student's statistic
- extremes and point processes
- methods of Poisson and compound Poisson approximation
- statistical inference, non-parametric estimation methods, heavy tail distributions
- financial stochastics (advanced models of financial time series, estimation of financial risks)

The proposed workshop will follow the tradition set up by the first international workshop *Recent Advances in Probability & Statistics* held in 2002. Anyone interested in giving a talk should contact Dr S.Y. Novak (S.Novak@mdx.ac.uk) providing the title and the abstract of the proposed talk. Posters are welcome as well. For further information visit the website http://mubs.mdx.ac.uk/conferences/PSFS/. This conference is supported by an LMS Scheme 1 grant.

LATINOAMERICANO DE ALGEBRA COLOQUIO

The *XVII Coloquio Latinoamericano de Algebra* brings together researchers of the international algebra community to show their latest works. This XVII event will be held in Medellin City, Colombia, from 23–27 July. The topics are:

- Number theory
- Combinatorics
- Rings
- Non-associative algebras and rings
- Commutative algebra
- Algebraic geometry
- Hopf algebras and mathematical methods in physics
- Representation theory
- Homological algebra
- Logic
- Models group theory
- Applications of algebra to number theory

The invited speakers are:

- Philip Kutzko (Iowa)
- Carlos Julio Moreno (CUNY)
- Cesar Polcino (São Paulo)
- Federico Ardila (San Francisco)
- Ivan P. Shestakov (São Paulo)
- Antonio Giambruno (Palermo)
- Eli Aljadeff (Technion)
- Ualbai Umirbaev (Kazakhstan)
- Vyacheslav Futorny (São Paulo)
- Le Dung Trang (ICTP, Italy)
- Marcelo Aguiar (Texas A&M)
- Vladislav Khartchenko (UNAM, México)
- Zoran Sunic (Texas A&M)
- Angus Macintyre (London)
- Roberto Cignoli (CONICET, Argentina)
- Aron Simis (Pernambuco, Brasil)
- Gerard Gonzalez Sprinberg (Grenoble)
- Daniel Panário (Carleton)

For more information about the Colloquium visit the website http://altenua.udea.edu.co/~claxvii/inglesindex.htm or email: claxvii@matematicas.udea.edu.co or cla.xvii@gmail.com.

BIOMOLECULAR STRUCTURES

The Institute for Mathematical Sciences (Singapore) is organizing a programme on *Computational Methods in Biomolecular Structures and Interaction Networks*. The programme will take place from 9 July – 3 August. This programme will discuss recent progress and facilitate the exchange of new ideas in the development and application of mathematical algorithms and computational methods for studying biomolecular structures, their interactions and networks. It is also intended to promote stronger communication and collaboration among mathematical, computational and biological scientists in order to examine essential and unsolved mathematical problems arising from structural and network biology.

The programme will be structured around two workshops and two tutorials designed to bring together researchers from a wide spectrum of mathematical and computational biology. The main themes to be covered include:

- Computational algorithms for large-scale analysis, classification and predictions of structures, motifs, modules, and biomolecular interactions;
- Mathematical models and computer simulation of structural and evolution dynamics of macromolecules and their interactions;
- Deterministic, probabilistic, and cellular automata models of biomolecular interaction networks and pathways;
- Algorithms for visualization of complex data and networks, as well as other unsolved problems arising from macromolecular imaging research.

For enquiries on scientific aspects of the programme email Vladimir A. Kuznetsov (kuznetsov@gis.a-star.edu.sg). For further information and to register visit the website www.ims.nus.edu.sg/Programs/biomolecular07/index.

INTEGRABLE MODELS, CONFORMAL FIELD THEORY

The 11th Annual UK meeting on *Integrable Models, Conformal Field Theory and Related Topics* will be held at King's College London from 11-12 May. The main aims of the meeting are: the dissemination, explanation and discussion of recent exciting results in this field; to promote communication and collaboration within the UK integrable models and conformal field theory community, and to bring mathematicians and physicists working in this area together; to act as a forum for young researchers to present their work and to become known and integrated into the community. Speakers include:
• A. Konechny (Heriot-Watt)
• M. Zamaklar (Durham)
• H. Saleur (Service de Physique Théorique, Commisariat à l'Energie Atomique)
• S. Fredenhagen (Potsdam)

This is supported by the LMS and the Mathematical and Theoretical Physics group of the Institute of Physics. The website is www.mth.kcl.ac.uk/icft07 and registration is open now.

FLUID DYNAMICS

The European Postgraduate Fluid Dynamics Conference (EPFDC) is a student-organised conference, designed to allow postgraduate student in all areas of fluid dynamics to present their research and learn about other student's research in a 'student oriented' environment. All participants are encouraged to give a short talk; however, this is optional. The conference also presents an excellent opportunity to meet other students through 'networking time' and social activities.

The conference will take place from Wednesday 8 to Friday 10 August at the School of Mathematics, University of Birmingham. In addition to the student talk there will also be three invited lectures cov-ering the broad spectrum of fluid dynamics:
• C.J. Chapman (Keele) *High speed flows*
• M. Griebel (Bonn) *Numerical methods*
• M. Heil (Manchester) *Biofluids*

The registration and conference fee is £80. More information and registration details can be found at www.epfdc.org.uk or email the organisers (info@epfdc.org.uk). This conference is supported by the School of Mathematics, University of Birmingham,and an LMS conference grant.

VORTEX DYNAMICS

EUROMECH Colloquium 491 *Vortex Dynamics from Quantum to Geophysical Scales* will be held at the University of Exeter from 11-14 September, supported by an LMS conference grant, with an allocation for UK-based PhD students. The aim of the colloquium is to bring together researchers with interests in vortex dynamics (classical and quantum) and related topics such as mixing and geophysical fluid dynamics. The areas to be highlighted include:
• Vortex dynamics: interaction and motion of vortices
• Vortex stability, linear and nonlinear
• Mixing of vorticity and scalars induced by vortices
• Role of vortices in geophysical fluid dynamical problems
• Vortex dynamics and stability in superfluid helium and atomic Bose-Einstein condensates
• Superfluid turbulence

Invited speakers include:
• David Dritschel (UK)
• Stephane Le Dizes (France)
• Tony Leonard (USA)
• Tomasz Lipniacki (Poland)
• Koji Ohkitani (UK)
• Ladislav Skrbek (Czech Republic).
For more information visit the website www.secam.ex.ac.uk/euromech491.

RECORDS OF PROCEEDINGS AT MEETINGS

ORDINARY MEETING

held on *Friday 9 February* at University College London. About 35 members and visitors were present for all or part of the meeting.

The meeting began at 3.30 pm, with the President, Professor J.F. TOLAND, FRS, FRSE, in the Chair.

Ten people were elected to Ordinary Membership: M.C. French, A. Gorban, U.G. Grimm, A.T. Hill, R. Hollerbach, M.P.J. Jensen, J. Panovska-Griffiths, D. Shkarin, G. Sisoev, A. Sofroniou; five people were elected to Associate Membership: P.B. Chapman, J.J. Miao, D.V. Mintz, I.D. Morris, B.F. Sehba and three people were elected under Reciprocity Agreements: J.C. Murray, W.J. Rieb, V.B.N. Vasilyev (all of the American Mathematical Society).

The Records of the Proceedings of the Society Meetings held on 3 July, 25 August, 11 September and 17 November 2006 were signed as a correct record.

One member signed the book and was admitted to the Society.

Professor H.M. BYRNE introduced a lecture given by Professor Philip Maini on *Emergent Phenomena – Fact or Fiction?*

After tea, Professor Bryne introduced the Mary Cartwright Lecture, given by Professor Angela Stevens on *Interacting Cell Systems: An Example for Mathematical Modelling in the Life-Sciences*.

After the meeting, a reception was held at De Morgan House, followed by a dinner at *Il Fornello Restaurant*.

BOSE-EINSTEIN CONDENSATION

The Institute for Mathematical Sciences (Singapore) is organizing a programme on *Bose-Einstein Condensation and Quantized Vortices in Superfluidity and Superconductivity*. The programme will take place from 1 November to 31 December in Singapore. This two-month programme will bring together leading international applied and pure mathematicians, theoretical and experimental physicists, and computational scientists, and researchers from NUS Departments of Mathematics, Physics, Material Sciences and Mechanical Engineering, and from A*STAR institutes IHPC and IMRE, to review, develop and promote interdisciplinary research on Bose-Einstein condensation and quantized vortex states and dynamics in superfluidity and superconductivity. The programme participants will:

- review the most recent and advanced developments in the research on Bose-Einstein condensation and quantized vortices in superfluidity and superconductivity, from experiment to theory, simulation and application;
- present the recently developed mathematical theories, including modelling, analysis and computational techniques, that are relevant to BEC and quantized vortices;
- discuss and compare different recently proposed scientific models for BEC, especially for BEC at finite temperatures, and fermion condensation;
- identify critical scientific issues in the understanding of BEC and quantized vortices and the difficulties that are common to both disciplines;
- accelerate the interaction of applied and computational mathematics with physics and materials science, and promote this highly interdisciplinary research that has emerging applications;

- develop and foster international collaborations in a new era of scientific research.

Visit www.ims.nus.edu.sg/Programs/bose07/index.htm for updates on the programme and registration. For general enquiries email imssec@nus.edu.sg. For enquiries on scientific aspects of the programme email Weizhu Bao (bao_weizhu@nus.edu.sg).

PARAMETER ESTIMATION FOR DIFFERENTIAL EQUATIONS

Estimating parameters in systems of non-linear differential equations from noisy data is a problem of both practical and theoretical importance, with applications in chemical engineering and neurobiology. J. Ramsay, G. Hooker, D. Campbell and J. Cao will be reading their paper *Parameter estimation for differential equations: A generalised smoothing approach* to the Royal Statistical Society on 9 May. For more information visit the website www.maths.lancs.ac.uk/~wite/RSS/. The preprint will be available two weeks prior to the meeting from the Royal Statistical Society website (www.rss.org.uk) and discussion and authors' replies will follow the presentation of the paper. Discussion contributions (limited to 400 words in print) are invited. Visit the RSS website for details on how to contribute to the discussion.

AARMS

The sixth annual Summer School of the Atlantic Association for Research in the Mathematical Sciences (AARMS) will be held at Dalhousie University, Halifax, Nova Scotia from 15 July to 10 August. The summer school is intended for graduate students and promising undergraduate students from all parts of the world. Each participant is expected to register for two of the courses. Each course consists of five ninety-minute lectures each week. These

are Dalhousie University graduate courses and the university will facilitate transfer credit to the extent possible. As in the previous Schools, four courses will be offered:

- *Polynomials* Ed Barbeau (University of Toronto)
- *Statistical Numerical Integration* Alan Genz (Washington State University)
- *Mathematical Models in Ecology and Evolution* Frithjof Lutscher (University of Ottawa)
- *Introduction to Number Theory* Alf van der Poorten (MacQuarie University)

If your application is accepted, your accommodation and meals will be covered while the School is running. Travel costs are not covered. For more information on course content visit www.aarms.math.ca/summer. To obtain an application form contact the School Director Pat Keast (keast@mathstat. dal.ca) or download a form from the School website.

REVIEWS

Ants, bikes & clocks: problem solving for undergraduates by William Briggs, SIAM, 2005, vi + 168 pp. US$42.00, £22.00, ISBN 0-89871-574-1

This book is presumably intended to be reading matter for American undergraduates. As such the target audience for those in the United Kingdom may be somewhat different, though that is not to say that many undergraduates in this country would not benefit considerably from working through this book. And that is rather the point. After the first, each of the relatively short chapters (there are 11) discusses some types of problem and then sets some problems (Exercises) for the reader to tackle. The benefit from this book comes from the time spent tackling these. There are Hints & Answers after each set of problems. And finally there is Chapter 12 with Solutions to most of the Exercises.

It took me quite a long time to read through this book. Not because it was not easily readable: on the contrary, the text is on

the whole very clear (there are one or two places where I found the American annoying, but we can live with that). No, the problem was the problems. I kept wanting to do them, if only to refresh my memory! Naturally there are, particularly in the early part of the book, some old favourites, such as the three unmarked jugs of capacities 3, 5 and 8, but there are also some more intriguing ones, which occupied me for a little while.

The opening chapter warns the reader against making assumptions and also emphasises the importance of actually reading the problem carefully – something my students in the past have been prone not to do. We move in Chapter 2 to a description of Pólya's paradigm for problem-solving: still the best way, in Briggs' view, of proceeding with a problem: "Understand, plan, execute, check."

In Chapter 3 we proceed from the general to the particular. We may have an overall strategy, but we need problem-specific techniques, so over the next few chapters we are led through Diophantine equations, coin-weighing problems, percentages and small changes. We then tackle problems involving rates of change – in two bites: one chapter dealing with constant rates, the next with variable rates using calculus. Chapter 8 brings us to difference equations and Markov chains and Chapter 9 discusses numerical methods, using a computer for iteration and approximation. Again, the point of checking that your procedure does what you think it does is well made. The examination of probabilistic problems in Chapter 10 is very accessible and finally there is a brief look at the process of modelling in mathematics.

There are one or two minor typos, but they do not detract from the general feel. And I was very pleased to find the marginal historical notes (there are some quotations from authors as diverse as Ogden Nash and Louis Pasteur).

So, what use could be made of this book? It would certainly make useful reading for any sixth-former intending to study mathe-

matics after leaving school. I would have found it useful as a means of provoking discussion when giving my students practice interviews for university entrance. Although quite a lot of the mathematics involved is very accessible – there are certainly some problems here which it would be possible to present to a Masterclass of interested, intelligent 14-year-olds – to my mind the best thing about this book, for those who are interested, is that problem-solving is fun! It's good to 'get stuck in' and have a go!

M.L. Perkins

Arthur Cayley, Mathematician Laureate of the Victorian Age by Tony Crilly, John Hopkins University Press, 2006, 784 pp, £46.50, ISBN 0-8018-8011-4

Arthur Cayley was born on 16 August 1821 in Richmond, Surrey. His father was a merchant who spent much time in St Petersburg, and Arthur spent the first seven years of his life there. After attending prep school, Arthur went to King's College on the Strand where his father paid 18 pounds 17 shillings per annum. This was less than the well-known public schools such as Eton and Harrow. It is probably lucky that the Cayleys did not afford these more expensive schools for there was an excellent mathematical education at King's, whereas the public schools would devote themselves more to the Classics.

In 1838 he entered Trinity College, Cambridge, and in 1842 he entered for the tripos. This was a notoriously difficult examination and the position of Senior Wrangler (the leading candidate in the exam) was of interest to the middle and upper classes and was placed on a par with horse racing in Ascot week. Later in the 19th century the tripos system achieved some level of notoriety. Bertrand Russell, who was seventh Wrangler in 1893, said of the tripos that it "led me to think of Mathematics as consisting of artful dodges and ingenious devices altogether too much like a crossword puzzle." The tripos

even tempted G. H. Hardy, who said that "I cannot remember ever having wanted to be anything but a mathematician", to give up mathematics. The most creative mathematical minds would not always achieve the position of Senior Wrangler but Cayley did and this led to the path by which he became Britain's leading mathematician.

He made many stunning discoveries at the forefront of 19th century mathematics. One such, which has had a profound influence on mathematics and is known to all undergraduates, is Matrix Theory. Crilly tells us of the famous Cayley-Hamilton Theorem that apparently Cayley discovered this (Hamilton's version was only for quaternions) but supplied a proof only for the 2x2 and 3x3 cases. However, Cayley worked on many areas of pure mathematics, such as Invariant Theory, Group Theory, non-Euclidean Geometry, and many of the links between Algebra and Geometry. He was not put off by abstraction (at a time when n-dimensional space was viewed as an obscure topic) and he reinvented octonions (a year after John Graves discovered them) feeling quite confident at working with non-commutative and non-associative algebras.

One of the interests of Crilly's book is that it tells us a lot about British mathematics in the 19th century. Not only does Cayley appear but also Boole, Hamilton, Salmon, De Morgan, Sylvester, Clifford and others. Cayley also had contact with many important European mathematicians such as Hermite, Klein and, towards the end of his life, Poincaré.

A telling passage of the book is Cayley's Presidential address at the British Association. *The Times* expressed an ambivalence at

having a mathematician as President. "That the mathematics would be unintelligible to the general public is not surprising but it would be of only marginal interest to the practical Scientist". *The Times* reported the ominous rumour that the president insisted on a blackboard and a supply of chalk being provided! Many mathematicians of today would sympathise with the speaker. Cayley observed when talking of mathematics in his presidential address to the British Association "The advances have been enormous, the actual field is boundless, the future full of hope." It is this attitude that maintained Cayley as such a formidable mathematician. He died in 1895.

Crilly's book is a beautifully written account of Cayley's life and of British mathematics in the 19th century. It is very well-researched. Just note the 145 pages of additional appendices and notes, including a useful glossary of mathematical terms, some of which have fallen out of use. Every university library should have a copy of this book as well as all those with an interest in mathematical history.

David Singerman
University of Southampton
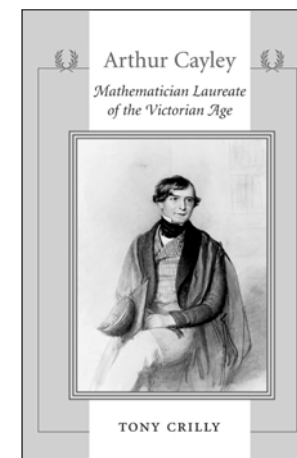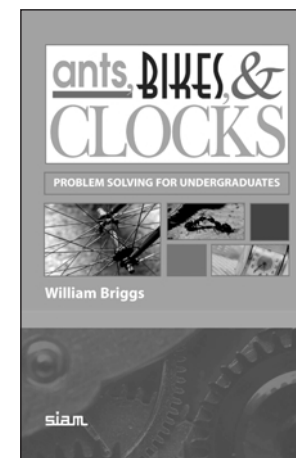
EPSRC

The London Mathematical Society

Homological Algebra and Equivariant Homology Theory

LMS-EPSRC Short Course

University of Southampton, 9 – 13 July 2007
Organisers: Peter H. Kropholler and Brita E.A. Nucinkis

The aim of the short course is to provide an introduction to homological algebra. More precisely, the goal is to provide a general understanding of the basic concepts involved and give an introduction to some applications in cohomology of groups, algebraic topology and equivariant homology theory. The course consists of three lecture courses of 6 lectures each:

- **Peter H. Kropholler** (Glasgow)
  Classical cohomology of groups and spaces
- **Brita E.A. Nucinkis** (Southampton)
  Bredon cohomology and classifying spaces for proper actions
- **Holger Reich** (Düsseldorf)
  Equivariant homology theories
- **Guest lecturer: Ian J. Leary** (Ohio State University)
  Classifying spaces and curvature

In addition there will be tutorial sessions run by postdoctoral researchers working in the field.

The course is aimed primarily at graduate students from all areas of pure mathematics. Furthermore, postdoctoral and young researchers are also encouraged to attend. The Course website is at: www.maths.soton.ac.uk/~bean/HomologicalAlgebra/index.html.

All research students registered at a UK university will be charged a registration fee of £100 (in the case of EPSRC funded research students, this fee should be paid by their departments from their DTA, for non-EPSRC research students, their department might be prepared to pay the fee). Overseas students, Postdocs and those working in industry must pay the full subsistence costs of £379, plus a registration fee of £250, making a total of £629 for this course. All participants must pay their own travel costs.

Applications should be made using the registration form available on the Society's website at: www.lms.ac.uk/activities/rmc/sc/35poster.html.

Numbers will be limited and those interested are advised to make an early application. The closing date for applications is **Friday 18 May**. All applicants will be contacted by the London Mathematical Society approximately one week after this deadline; we will not be able to give information about individual applications before then.

About the Short Courses
The principal aim of the courses is to provide training for postgraduate students in core areas of mathematics. The courses are intended to provide high quality courses for graduate students from around the country in an effective and efficient manner. Part of their success is the opportunity for students to meet other students working in related areas as well as the chance to meet a number of leading experts in the topic.

EPSRC

The London Mathematical Society

Fusion Systems

LMS-EPSRC Short Course

University of Birmingham, 30 July – 3 August 2007
Organisers: Chris Parker & Sergey Shpectorov

Fusion systems are mathematical objects that bring together groups and their representations and algebraic topology. This course aims to introduce students to the general theory behind Fusion Systems by presenting them simultaneously from a Group Theoretic, Representation Theoretic and Topological point of view. The course consists of three series of five lectures as follows:

- Michael Aschbacher (Caltech) *Local theory of saturated fusion systems and p-local finite groups*
- Radha Kessar (Aberdeen) *Modular representation theory, blocks and fusion system*
- Bob Oliver (Paris) *Topological aspects of fusion systems*

Two guest lectures will be given on Friday 3 August:

- Carles Broto (Barcelona) *Homotopy theory and p-local groups*
- Markus Linckelmann (Aberdeen) *On control of fusion*

The course will be particularly valuable to postgraduate students studying group theory, representation theory or algebraic topology. More specific details about the course including the registration fees and the content of the lectures can be found at our website:

http://web.mat.bham.ac.uk/C.W.Parker/Fusion/lmsfusion.htm.

The number of people admitted to the course will be limited and so applications should be made using the online registration form available on the London Mathematical Society's website at:

www.lms.ac.uk/activities/rmc/sc/36poster.html.

The closing date for online registration is **Friday 25 May 2007**.

About the Short Courses
The principal aim of the courses is to provide training for postgraduate students in core areas of mathematics. The courses are intended to provide high quality courses for graduate students from around the country in an effective and efficient manner. Part of their success is the opportunity for students to meet other students working in related areas as well as the chance to meet a number of leading experts in the topic.

ISAAC NEWTON INSTITUTE FOR MATHEMATICAL SCIENCES

GAUGE FIELDS AND STRINGS

17 – 27 September

in association with the Newton Institute programme entitled
Strong Fields, Integrability and Strings (23 July to 21 December 2007)

School organiser: David Tong (Cambridge).

Theme of school: The past decade has seen an explosion of activity in the interface between gauge theory and string theory, spurred by the celebrated AdS/CFT correspondence. Gravitational techniques now play a key role in our understanding of strongly coupled phenomena in four dimensional quantum field theories. The applications to QCD are becoming increasingly broad and now include aspects of hadron spectroscopy and matter at high densities.

This school is aimed at graduate students and young researchers. It will include both introductory and advanced lectures. Each speaker will give a course of 3-4 lectures.

Lecture topics include: Supersymmetric Gauge Theories, Supersymmetry Breaking, Introduction to AdS/CFT, QCD Strings from the Lattice, String Theory and QCD, Relativistic Heavy Ion Collisions, Black Holes in Yang-Mills Theories, D-Brane Dynamics and Gauge Theories, Integrability in N=4 Super Yang Mills.

Speakers: Niklas Beisert (MPI), David Kutasov (U. Chicago), David Mateos (Santa Barbara), Shiraz Minwalla (TIFR, Mumbai), Carlos Nunez (Swansea), Nathan Seiberg (IAS), Mike Teper (Oxford), Brian Wecht (MIT), Larry Yaffe (U. Washington, Seattle), Konstantin Zarembo (Uppsala).

Location and cost: The school will take place at the Newton Institute and accommodation for participants will be provided in a single study bedroom with shared bathroom at Churchill College. The full package, costing £750, includes accommodation, breakfast and dinner from dinner on Sunday 16 September to breakfast on Friday 28 September, and lunch and refreshments during the days that lectures take place. Participants who wish to attend but do not require the full package will be charged a registration fee of £150. Self-supporting participants are very welcome to apply.

Limited financial support is available for students. To be considered for financial support, please send a CV and a supporting letter.

Further information and application forms are available from the web at: www.newton.cam.ac.uk/programmes/SIS/sisw02.html. Completed application forms should be sent to Tracey Andrew, Programme & Conference Secretary, Isaac Newton Institute, 20 Clarkson Road, Cambridge CB3 0EH or via email to: t.andrew@newton.cam.ac.uk.

Closing date for the receipt of applications is **31 May**.

ISAAC NEWTON INSTITUTE FOR MATHEMATICAL SCIENCES

INTEGRABILITY AND THE GAUGE/ STRING CORRESPONDENCE

10 – 14 December

in association with the Newton Institute programme entitled
Strong Fields, Integrability and Strings (23 July to 21 December 2007)

Scientific organising committee: Nick Dorey (Cambridge), Niall MacKay (York), Arkady Tseytlin (Imperial College London) and Konstantin Zarembo (Uppsala).

Theme of workshop: In the last few years integrability has been central to some significant progress in the gauge/string correspondence. On the string side, classical strings have been described using integrable systems, while the quantum implications of the symmetries of the full $AdS5 \times S5$ string are only beginning to be understood. On the gauge side, the correspondence between operator dimensions and spin chains is proving to be enormously powerful. Integrability has also been of increasing importance in gauge theories with less supersymmetry. This workshop brings together experts both in integrable models and techniques and in their applications to gauge fields and strings, to survey recent progress and explore likely future directions.

Speakers: G. Arutyunov (Utrecht), N. Beisert (MPI), A. Belitsky (Arizona), N. Berkovits (IFT-UNESP), H. Braden (Edinburgh), E. Corrigan (York), P. Dorey* (Durham), P. Fendley (Virginia), G. Ferretti* (Chalmers), S. Frolov (MPI), R. Janik (Jagellonian U.), V. Kazakov (ENS), G. Korchemsky (Paris XI), C. Kristjansen (NORDITA), M. Kruczenski (Princeton), J.-M. Maillet* (ENS Lyon), A. Mikhailov (CalTech), J. Minahan (Uppsala), J. Plefka (MPI), N. Reshetikhin (Berkeley), R. Roiban (Penn State), H. Saleur (USC/CEA Saclay), D. Serban (CEA), M. Staudacher (MPI) and M. Zamaklar (Durham).
* to be confirmed

Location and cost: The workshop will take place at the Newton Institute and accommodation for participants will be provided in a single study bedroom with shared bathroom at Wolfson Court. The workshop package, costing £450, includes accommodation, breakfast and dinner from dinner on Sunday 9 December to breakfast on Saturday 15 December, and lunch and refreshments during the days that lectures take place. Participants who wish to attend but do not require the workshop package will be charged a registration fee of £90. Self-supporting participants are very welcome to apply.

Further information and application forms are available from the web at: www.newton.cam.ac.uk/programmes/SIS/sisw03.html. Completed application forms should be sent to Tracey Andrew, Programme & Conference Secretary, Isaac Newton Institute, 20 Clarkson Road, Cambridge CB3 0EH or via email to: t.andrew@newton.cam.ac.uk.

Closing date for the receipt of applications is **31 July**.

ISAAC NEWTON INSTITUTE FOR MATHEMATICAL SCIENCES

FUTURE DIRECTIONS IN PHYLOGENETIC METHODS AND MODELS

17 – 21 December

in association with: Newton Institute programme
Phylogenetics (3 September to 21 December)

Sponsored by: Allan Wilson Centre for Molecular Ecology and Evolution

Organisers: Vincent Moulton (University of East Anglia) and Katharina Huber (University of East Anglia).

Theme of workshop: This workshop will showcase the leading edge of phylogenetic theory – from questions and challenges posed by biologists, to novel approaches for dealing with new types of data, and an outline of outstanding mathematical problems to be resolved. The workshop will be based around the following themes (one for each day):

- Challenges for tree reconstruction from molecular data
- Population genetic aspects of phylogenetics
- Phylogenetic combinatorics and algebra
- Speciation, extinction and tree shape
- The tree of life

Keynote speakers: David Aldous (Berkeley), Andreas Dress (PICB Shanghai, Andrew Roger (Dahlhousie), Noah Rosenberg (Michigan) and Tandy Warnow (Texas).

Participant presentations: Participants are welcome to submit an abstract to give a short talk (25 mins) and a selection of these will be made for the meeting; remaining participants will be given the opportunity to present a poster. Participants wishing to apply to give a short presentation (or poster) should indicate this on their workshop application form, and also provide a brief abstract consisting of at most 250 words together their name, affiliation, current position and proposed presentation title.

Location and cost: The workshop will take place at the Newton Institute and accommodation for participants will be provided in a single study bedroom with shared bathroom in Wolfson Court. The workshop package, costing £450, includes accommodation, breakfast and dinner from dinner on Sunday 16 December to breakfast on Saturday 22 December, and lunch and refreshments during the days that lectures take place. Participants who wish to attend but do not require the workshop package will be charged a registration fee of £90. Self-supporting participants are very welcome to apply.

Further information and application forms are available from the web at: www.newton.cam.ac.uk/programmes/PLG/plgw03.html. Completed application forms should be sent to Tracey Andrew, Programme & Conference Secretary, Isaac Newton Institute, 20 Clarkson Road, Cambridge CB3 0EH or via email to: t.andrew@newton.cam.ac.uk.

Closing date for the receipt of applications is **31 July**.

CALENDAR OF EVENTS

This calendar lists Society meetings and other events publicised in the *Newsletter*. Further information can be obtained from the appropriate LMS *Newsletter* whose number is given in brackets. A fuller list of meetings and events is given on the Society's website (www.lms.ac.uk/meetings/calendar.html).

APRIL

10-14 LMS Invited Lectures, The Geometric Langlands Correspondence, Oxford (355)
11-13 Postgraduate Group Theory Conference, Cambridge (355)
15-20 An Introduction to Multiscale Methods, LMS-EPSRC Short Course, Warwick (356)
16-19 BMC, Swansea (357)
16-21 Geometry and Algorithms ICMS Workshop, Edinburgh (358)
17-19 BAMC, Bristol (354)
20 LMS Midlands Regional Meeting, Loughborough (358)
21-23 Tropical Geometry Workshop, Loughborough (358)
24 David Crighton Lecture, London (358)
24-27 Applying Geometric Integrators ICMS Workshop, Edinburgh (358)
27 Edinburgh Mathematical Society Meeting, Stirling (350)
27 Women in Mathematics Day, De Morgan House, London (358)

MAY

7-11 Statistical Methods for Genetic Epidemiology ICMS Workshop, Edinburgh (358)
11 Yorkshire and Durham Geometry Day, Leeds (358)
11-12 Integrable Models, Conformal Field Theory Meeting, King's College London (358)
17-18 Ergodic Theory Meeting, Warwick (358)
18-19 Groups in Galway Conference, Galway (357)

18-20 Midwest Geometry Conference, Iowa, USA (350)
22 Multiplying and Dividing Whole Numbers, Gresham College London (355)
25 Edinburgh Mathematical Society Meeting, Aberdeen (350)
26-28 Mathematical Theories of Abstraction, Substitution and Naming in Computer Science ICMS Workshop, Edinburgh (358)
29-1 Jun Applied Stochastic Models and Data Analysis Conference, Crete, Greece (355).
29-1 Jun Analysis on Graphs and its Applications Workshop, Cardiff (358)
30 LMS South West & South Wales Regional Meeting, Cardiff (358)
31-2 Jun Recent Advances in Probability, Statistics & Financial Stochastics Workshop, London (358)

JUNE

2-9 Symmetry and Perturbation Theory Conference, Otranto, Italy (356)
6-8 Representation Theory of *p*-adic Groups, King's College London (358)
18-19 Hamiltonian Dynamical Systems and Applications Seminar, Montreal (355)
18-22 Cherednik Algebras ICMS Workshop, Edinburgh (358)
22 LMS Meeting, London
25-30 Number Theory and Computability ICMS Workshop, Edinburgh (358)
30 Euler's Mathematical Legacy Meeting, Oxford (356)
30-4 Jul Geometry of Riemann Surfaces Conference, Crete (356)

JULY

2-6 Journées Arithmétiques Meeting, Edinburgh (357)
2-6 Effective Computational Methods for Highly Oscillatory Problems Workshop, INI, Cambridge (353)
2-6 Applications of Multiscale Methods and Statistical Inference Course, London (357)
4-6 Singularity Theory Conference, Liverpool (358)

A.B. BASSET
LMS member 1883-1899

Alfred Barnard Basset, MA Trinity College Cambridge, FRS, FCPS
United University Club
LMS Council 1888-1894, Vice-President 1892-1893