THE LONDON MATHEMATICAL SOCIETY

NEWSLETTER

No. 320 November 2003

## Forthcoming Society Meetings

### 2003

**Friday 21 November**
**London**
L.C.G. Rogers
M.H.A. Davis
(Naylor Lecture)
[*page 3*]

### 2004

**Friday 7 January**
**AMS Meeting, Arizona**
G. van der Geer
[*page 4*]

**Friday 20 February**
**London**
D. Schleicher
S.M. Rees
(Mary Cartwright Lecture)

**Wednesday 12 May**
**Nottingham**
Midlands Regional Meeting

**Friday 18 June**
**London**
Hardy Lecture

**Friday 2 July**
**Newcastle**
Northern Regional Meeting

## INTERNATIONAL REVIEW OF MATHEMATICS Report 8

The Chair of the International Panel, Professor Jean-Pierre Bourguignon, visited London on 17 September for a meeting with Martin Taylor (Chair of the Steering Group), Stephen Huggett (Scientific Secretary) and Peter Cooper (representing the Council for Mathematical Sciences).

This was a very fruitful meeting, discussing all aspects of the plans for the Review, and it enabled us to refine the details of the visits to the eight venues, the briefs for the landscape documents, and the involvement of the Steering Group during the Review week.

As a result, the Steering Group meeting on 18 September was an especially useful one.

We considered reports from the various venues, noting with approval the draft programme of presentations at Bristol and the collaboration between Bristol and Durham over the presentation of research in probability. We also responded to several specific questions which had been put to us about these presentations and more generally about the visits.

We reviewed and agreed the plans for the background briefings to be given to the Panel while they are in London.

We considered in more detail than before the data document to be provided to the Panel before the Review week. This will contain background information (largely statistical, but some descriptive) on the structure and funding of the mathematics and statistics community in Britain, and in particular we considered which aspects of a bibliometric analysis would be useful. Here, as elsewhere, contributions from Jean-Pierre Bourguignon were invaluable.

Finally, we considered the landscape documents, endorsing Professor Bourguignon's views on them and agreeing a refinement of the brief. It is a pleasure to be able to report that at the time of writing they are arriving thick and fast, and to thank the authors for their hard work on this difficult task.

Work continues on finalising travel and accommodation arrangements for the Panel.

Please monitor the website (www.cms.ac.uk/irm) for the latest developments; you can email comments to me at irmsissec@lms.ac.uk.

Stephen Huggett
Scientific Secretary to the Review

## EPSRC-FUNDED STUDENTS AND LMS MEMBERSHIP

The LMS is one of several learned societies that are taking part in a pilot scheme with EPSRC to offer 'free' membership to EPSRC-funded students. Under this scheme EPSRC will meet the costs of students' subscriptions (but not journals) for up to five years.

Students will benefit from free membership of the Society and consequently enjoy access to a range of services that will benefit their further professional development. In particular, participation in events (conferences, networks, etc) and keeping more closely in touch with activities in the mathematics community.

The EPSRC hopes this will strengthen links with the students it sponsors and enable it to conduct a long-term evaluation of how its students have developed their careers beyond their first destinations. The LMS and EPSRC will also benefit from closer collaboration.

Further details of the scheme are available on the EPSRC website (www.epsrc.ac.uk). The LMS membership application form can be downloaded from the LMS website (www.lms.ac.uk/contact/membership.html) or is obtainable from the LMS office.

Members are encouraged to make their students aware of, and sign up for, this scheme. Enquiries should be directed to Peter Cooper at the Society (cooper@lms.ac.uk).

## ANNUAL DINNER

The Annual Dinner will be held after the Annual General Meeting on Friday 21 November at 7.30 pm at The Montague on the Gardens Hotel, 15 Montague Street, London WC1. The cost is £32.00 per person and members may book places for guests. The booking form, enclosed with the October *Newsletter*, should be returned together with payment to the London Mathematical Society office by **Monday 17 November**.

## NOVEMBER LMS DEADLINES

| | |
|---|---|
| 1st | Payment of annual subscription |
| 13th | Return of ballot papers for Council Elections and Nominating Committee |
| 17th | Booking for the Annual Dinner |

## LMS Newsletter

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Designed by CHP Design (tel: 020 7240 0466, email: info@chpdesign.com, web:www.chpdesign.com).
Publication dates and deadlines: published monthly, except August.
Items and advertisements by first day of the month prior to publication.
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Charity registration number: 252660.



## LONDON MATHEMATICAL SOCIETY
# Annual General Meeting

### Friday 21 November 2003, University College London

The meeting will be held at the Chemistry Lecture Theatre, Christopher Ingold Building, University College London, 20 Gordon Street, London WC1. Please note early start.

**3.15 – 3.30 Annual General Meeting**

**3.30 – 4.30 Professor L.C.G. Rogers (Cambridge)**

*Monte Carlo valuation of American options*

This paper introduces a 'dual' way to price American options, based on simulating the path of the option payoff, and of a judiciously-chosen Lagrangian martingale. Taking the pathwise maximum of the payoff less the martingale provides an upper bound for the price of the option, and this bound is sharp for the optimal choice of Lagrangian martingale. As a first exploration of this method, three examples are investigated numerically; the accuracy achieved with even very simple-minded choices of Lagrangian martingale is surprising. The method also leads naturally to candidate hedging policies for the option, and estimates of the risk involved in using them.

**4.30 – 5.00 Tea**

**5.00 – 6.00 Professor M.H.A. Davis (Imperial College London)**

2002 Naylor Prize Lecture

*Optimal investment with randomly terminating income*

Theories of optimal investment are generally based on maximizing expected utility of wealth at a fixed time, or of consumption, starting with an initial endowment. Adjusting current theories to allow for income streams is a simple matter if the income is hedgeable – i.e., it is known in advance or, more generally, can be replicated by trading in the market. For unhedgeable income streams the general theory, based on convex duality, is much more complicated and is a subject of current research. Here we solve a specific problem in which income is constant up to an independent termination time. The dual problem turns out to be a deterministic optimal control problem with surprisingly delicate properties.

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).

The meeting will be followed by the Annual Dinner. For further details see the announcement in this *Newsletter* (page 2). All enquiries may be addressed to Susan Oakes (tel: 020 7637 3686, e-mail: oakes@lms.ac.uk).

## LMS AT THE AMS, PHOENIX

The London Mathematical Society will be holding a Meeting and Reception during the American Mathematical Society Meeting at Phoenix, Arizona which runs from 7-10 January 2004.

The Society Meeting will be held at 3.30 pm on Friday 7 January at which Professor Gerard van der Geer (KdV Institute, UWA) will give a lecture on *Curves over finite fields and congruences between modular forms*. The meeting is to celebrate the relaunch of *Compositio Mathematica* under a not-for-profit publishing collaboration, and a consequent drop in the price. Gerard van der Geer is the Managing Editor of *Compositio Mathematica*. LMS members who have not already done so will have the opportunity to sign the Membership Book which dates back to 1865.

The Meeting will then be followed by a reception at 5.00 pm. Members who wish to attend the reception should apply for their free ticket to the Administrator, London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HS (e-mail: oakes@lms.ac.uk) no later than **18 December**. The Society hopes to entertain as many as possible of its members who are attending the AMS Meeting, but numbers are limited by the capacity of the room.

## ROYAL SOCIETY WOLFSON MERIT AWARD

Professor Nick Higham, who is Richardson Professor of Applied Mathematics and Director of the Manchester Centre for Computational Mathematics, has been awarded a Royal Society Wolfson Merit Award. He will receive £175,000 over the next five years to help him further his research.

Professor Higham's work ranges from developing fundamental theory to constructing numerical algorithms and software. One of his current research interests is the analysis and solution of structured matrix problems arising in engineering applications.

## THE ABEL PRIZE 2004 Call for Nominations

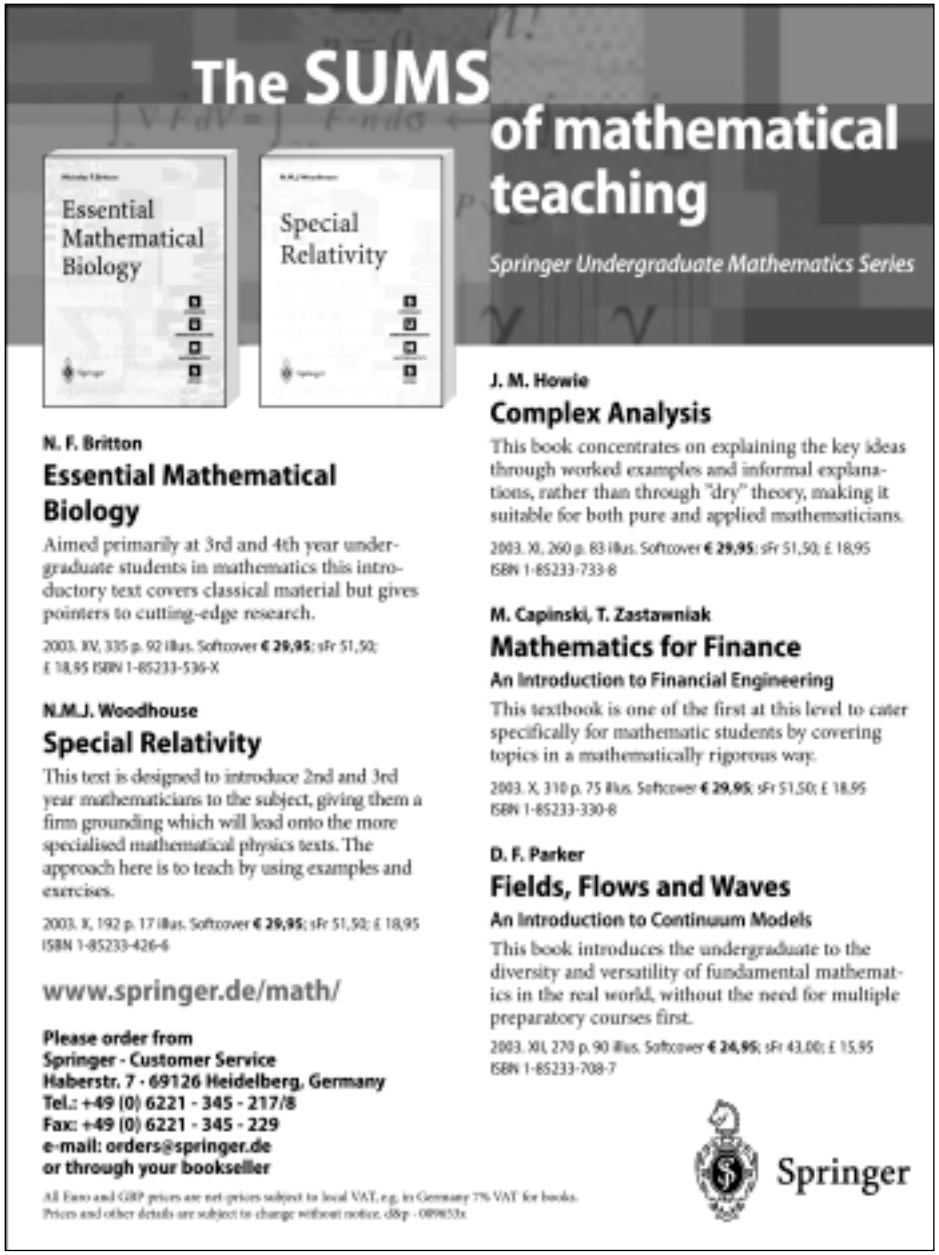
The Norwegian Academy of Science and Letters hereby calls for nominations of candidates for the Abel Prize 2004. The Abel Prize, which was awarded for the first time in 2003, amounts to NOK 6 million (approximately €750,000). It is an international prize for outstanding scientific work in the field of mathematics, including mathematical aspects of computer science, mathematical physics, probability, numerical analysis and scientific computing, statistics, and also applications of mathematics in the sciences.

The prize is to recognize contributions to mathematics and its applications of extraordinary depth and influence. Such work may have resolved fundamental problems, created powerful new techniques, introduced unifying principles or opened up major new areas. The intent is to award prizes over the course of time in a wide range of areas of mathematics and its applications.

The Abel Committee will submit a recommendation of a candidate for the Abel Prize to The Norwegian Academy of Science and Letters, which will select the Abel laureate on the basis of this recommendation. The name of the Abel laureate will be announced in late March 2004.

The nomination letter should contain a CV and a description of the candidate's works together with names of distinguished specialists who can be contacted for independent opinion. The letter should be sent, no later than **15 November 2003**, to The Norwegian Academy of Science and Letters, Drammensveien 78, NO-0271 Oslo, Norway. Visit the website for further information (www.abelprisen.no).





## CRITICAL MASS IN MATHEMATICS

Owing to a recent increase in the EPSRC Mathematics Programme's budget for research grants, significant funding has been provided to support the establishment of centres of multidisciplinary critical mass which connect mathematics to other disciplines. Competition for these grants is high, and only one centre per year is established.

This year's grant, the second in the initiative, had been made to Professor David Rand at the Mathematics Institute, Warwick University. The aim is to develop an integrative approach to the analysis of cellular systems regulation by developing computational and mathematical tools capable of integrating and analysing the diverse sources of cellular data.

The grant, of £1.26 million, is the second largest research grant ever awarded by the Mathematics Programme and includes a £200,000 contribution from BBSRC.

## EPSRC-NERC POSTDOCTORAL FELLOWSHIPS

Two prestigious three-year Fellowships in Environmental Mathematics & Statistics (EMS) are available to enhance collaborations between mathematical/statistical and life science/environmental communities. Applications are invited from either (a) outstanding mathematicians/statisticians to carry out research in an environmentally focused group, or (b) life/environmental scientists to carry out environmental research using cutting edge mathematical or statistical techniques. Proposals must demonstrate a significant interdisciplinary skills transfer element and lie within remit of the EMS Programme. Applicants must hold a PhD or DPhil (final year PhD students may apply), but must not be in a permanent academic position. The closing date for applications is 15 November 2003.

For further information please see website: www.nerc.ac.uk/funding/interdisciplinary/ao-postdoc-rnd2.shtml, or contact Frances Collingborn (NERC), email: frco@nerc.ac.uk, tel: 01793 411737; or Allison McCaig (EPSRC), email: Allison.mccaig@epsrc.ac.uk, tel: 01793 444035.

## GEOFFREY T. KNEEBONE

Dr Geoffrey Thomas Kneebone, who was elected a member of the London Mathematical Society on 4 December 1944, was born on 24 February 1918 and died on 30 September 2003, aged 85. He graduated with BSc (1939), MSc (1941) and PhD (1943) degrees from the University of London. His first academic post was as Assistant Lecturer at Westfield College, University of London, 1943-6, starting during its wartime evacuation to St Peter's Hall, Oxford. He joined Bedford College, University of London in 1947, and stayed there for the rest of his career, becoming Reader in the Foundations of Mathematics (1964) and Mathematics (1976); he retired in 1983.

Kneebone will be best remembered as co-author of the two classic 'Semple and Kneebone' books (with J.G. Semple (1904-85)), *Algebraic Projective Geometry* (OUP, 1952) and *Algebraic Curves* (OUP, 1959). Originally a geometer, his interests changed to logic, through pondering the foundations of geometry (as did Hilbert's). This led to his two later books, *Mathematical Logic and the Foundations of Mathematics* (Van Nostrand, 1963) and (with Brian Rothman) *The Theory of Sets and Transfinite Numbers* (Oldbourne, London, 1966).



## THE 2004 HARDY FELLOW

Professor TERENCE TAO of the University of California Los Angeles has accepted the Society's invitation to be the Hardy Fellow for 2004.

Professor Tao will visit the UK for about three months between April and June, and will hold his Fellowship at Edinburgh University, where his host will be Professor Tony Carbery. During the tenure of his Fellowship, he will visit other institutions, and will give seven or eight lectures, including the 2004 Hardy Lecture to the Society on Friday 18 June. He has suggested the following lectures:

**Honeycombs and sums of Hermitian matrices** In 1912 Weyl posed the following problem: given the eigenvalues of two n x n Hermitian matrices A and B, what are the possible sets of eigenvalues of A+B? This question has been studied extensively, and is linked with representation theory, symplectic geometry, algebraic geometry, and several other fields. After a long series of work on this problem, the final piece of the solution was put in place in 1999 (though there are now several independent proofs). We describe the original solution, which revolves around a geometric object called a 'honeycomb'.

**The Kakeya problem and arithmetic combinatorics** Define a Besicovitch set to be a subset of R^n which contains a unit line segment in every direction. The Kakeya conjecture asserts that such sets always have Hausdorff dimension n; this conjecture has been proven in two dimensions but one only has partial results in higher dimensions. This problem turns out to have important connections to harmonic analysis, PDE, and even algebraic geometry and the combinatorics of sum sets. We will survey these connections and describe some recent results.

**Low regularity solutions of the KdV equation** The Korteweg de Vries equation (KdV) models shallow waves in a canal, and has both fascinating algebraic structure (in particular, it is completely integrable) and a subtle analytic structure (requiring modern techniques in oscillatory integrals and exponential sums). In this talk we describe recent work in understanding the low regularity behaviour of the KdV equation, in particular in constructing global solutions for data which can be as rough as a Dirac delta mass (and even rougher!). Also we combine this theory with the theory of symplectic capacity to prove a 'symplectic nonsqueezing' result for this equation.

**The global behaviour of nonlinear Schrödinger equations** We discuss some recent progress in understanding the family of PDE known as nonlinear Schrödinger equations, focusing in particular on their asymptotic behaviour at infinity. While there are still many open problems out there, notably the soliton resolution conjecture (in the non-integrable case) and understanding the nature of blowup, there has been much progress in combining both the Fourier-analytic analysis of the equation with the conserved quantities and monotone quantities of the equation, allowing us to derive rigorous results concerning such phenomena as scattering, orbital stability, weak turbulence, blowup, and asymptotic stability.

**The nonlinear Fourier transform** The linear Fourier transform can be used to analyze functions which take values in a vector space. If however the function takes values in a non-abelian group, then one must instead use the non-linear Fourier transform (also known as the scattering transform), which is used in the theory of integrable PDE, the spectral theory of differential operators (or Jacobi matrices), the theory of orthogonal polynomials, of Gaussian processes, inverse scattering theory, Riemann-Hilbert problems, etc. In this talk we discuss this transform and its surprisingly strong analogy with the linear Fourier transform, and discuss some recent results.

Institutions that wish to invite Professor Tao to give a lecture should write to the Programme Secretary, Dr S.A. Huggett (s.huggett@plymouth.ac.uk) by **1 December 2003**. It is expected that more invitations will be received than can be accepted, and neighbouring institutions are therefore encouraged to submit joint invitations. The itinerary and lecture title at each venue will be decided by the Society's Programme Committee, in consultation with Professor Tao, Professor Carbery and with the host institutions.

## VISIT OF PROFESSOR J. XIONG

Professor Jie Xiong (University of Tennessee, USA – currently at WIAS, Berlin) will be visiting the Department of Mathematics, Imperial College London from 18 November – 2 December. During his visit he will give the following talks:

- *A stochastic log-Laplace equation with applications*, Department of Statistics, University of Warwick (19 November)
- *Nonlinear filtering: from Ornstein-Uhlenbeck to white noise*, Department of Mathematics, Imperial College London (27 November)
- *The solutions to a class of non-linear stochastic partial differential equations*, Mathematical Institute, University of Oxford (1 December)

His visit is partially funded by an LMS scheme 2 grant. For further information contact Dan Crisan (d.crisan@imperial.ac.uk).

## SECANTS

SECANTS (South of England Computational and Algorithmic Number Theory Seminars) will hold its 22nd meeting on Saturday 29 November at Royal Holloway. The speakers will be Igor Shparlinski (Macquarie), Simon Blackburn (Royal Holloway), Tim Browning (Oxford) and Richard Brent (Oxford). SECANTS is funded by an LMS Scheme 3 grant. For more details of the programme and venue, as well as general information about SECANTS, and how to be put on the email mailing list, visit the website (www.maths.nott.ac.uk/personal/jec/secants/secants22.html).

## ICM 2006 SPAIN

The next International Congress of Mathematicians (ICM 2006) will take place in Madrid, Spain, 22-30 August 2006. For information visit the website (www.icm2006.org).

Emmanuel College, Cambridge

**MEGGITT FELLOWSHIP IN MATHEMATICS**

Applications are invited from men and women for the Meggitt Fellowship in any area of pure or applied Mathematics, tenable for five years from 1 October 2004. Applicants will be required to pursue their own research and to teach 6 hours per week for the College.

Requests for application forms and further particulars should be directed, in writing, to the Master's Secretary, Emmanuel College, Cambridge CB2 3AP, enclosing a **large** self-addressed envelope or downloaded via the College website at www.emma.cam.ac.uk/meggitt.

Applications close on **21 November 2003**.



## VISIT OF PROFESSOR J.A. KAMINKER

During a visit to the UK supported by an LMS Scheme 2 grant, Professor J.A. Kaminker (IUPUI, Indianapolis) will be giving two lectures on 'Noncommutative geometry and hyperbolic dynamics'. The lectures are on Saturday 1 November at Nottingham University at 2.00 pm and 4.30 pm in C4 of the Math/Physics building (main campus). He will also lecture on related topics on Tuesday 4 November 4.00 pm at the University of Newcastle and later that week at Glasgow University. For further information contact Dr J.P.H. Zacharias Department of Mathematics, University of Nottingham (tel: 0115 951 4943; email: joachim.zacharias@nottingham.ac.uk).

## PANDA

A meeting in the series entitled Patterns, Nonlinear Dynamics and Applications (PANDA) organised under an LMS Scheme 3 grant, will be held in DAMTP, Centre for Mathematical Sciences, University of Cambridge on Friday 12 December. Pedagogical seminars will be given by Chris Budd (Bath) and David Chillingworth (Southampton). There will also be a number of shorter contributions – prospective speakers should contact Jon Dawes (J.H.P.Dawes@damtp.cam.ac.uk). Postdoctoral researchers and PhD students are encouraged to attend and to contribute talks.

## K-THEORY DAY

The 28th K-theory Day will take place at the Mathematical Institute in Oxford on Monday 3 November. The speakers will be G. Segal (Oxford), T. Schick (Göttingen) and R. Plymen (Manchester). For further information contact U. Tillmann (tillmann@maths.ox.ac.uk) or visit the K-theory Days webpage www.maths.soton.ac.uk/staff/Brodzki/Ktheory/index.html. The K-theory Days are sponsored by the LMS under a Scheme 3 grant.

## VISIT OF PROFESSOR J. CONWAY

Professor John Conway (Princeton University) will be visiting the UK at the end of November and early December. During his visit he will give lectures at Warwick University (Thursday 27 and Friday 28 November), the joint BSHM-Greenwich University meeting at Greenwich University on 'von Neumann and Computing' (Saturday 29 November) and at the Open University (Monday 1 December). For further information contact Professor Jeremy Gray, Faculty of Mathematics, Open University (j.j.gray@open.ac.uk) or Professor Miles Reid, Mathematics Institute, University of Warwick (miles@maths.warwick.ac.uk). His visit is supported by an LMS Scheme 2 grant.

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## A SQUEEZE ON GRANTS

Members may already be aware that over the last year Programme Committee has had to be less generous than it would have liked in awarding grants. Sadly, the Society's income is such that we shall have to decrease our budget for 2003/4 substantially.

Programme Committee met in September to discuss how best to use our limited resources. For Scheme 1, conference grants, we decided to focus our support on smaller conferences. Even so, we will not always be able to award the full amount applied for. However, we would hope in this way to maintain the number of conferences we can support.

We also introduced new guidelines for Scheme 4, collaborative small grants. Each application should be for one visit only, normally only one grant will be made per collaboration in any financial year, and a new upper limit of £250 will be imposed for visits between UK institutions, keeping the £500 limit where one of the collaborators is outside the UK.

Please do not let this financial situation deter you from applying for a grant. Unfortunately, fewer applications will be successful than in the recent past, but we shall continue to distribute a considerable sum of money as fairly as we can. To this end it would be helpful if you could adhere closely to the guidelines, which are available on our website (www.lms.ac.uk).



## LONDON MATHEMATICAL SOCIETY
## Popular Lecture Videos

The Popular Lectures aim to present interesting mathematical topics in an attractive way. The intended audience is post-16 level mathematics students and amateur mathematicians, but the videos would also provide good enrichment material for students and lecturers in university mathematics departments. The videos cost £10 each but can be obtained at the reduced price of £7.50 each if you buy two or more.

- ***Mathematics, Magic and the Electric Guitar*** Dr D.J. Acheson
- ***The Music of the Primes*** Professor M. du Sautoy
- ***Our Dynamic Sun*** Dr H.E. Mason
- ***Geometry Ancient and Modern*** Dr J.R. Silvester
- ***Codes*** Professor P.J. Cameron
- ***Simulating the World*** Professor C.J. Budd
- ***Simplicity and Complexity*** Professor J. Barrow
- ***Fractals the New Geometry*** Professor K.J. Falconer
- ***Floating, Spinning Tumbling*** Dr F. Berkshire
- ***Tangent Circles, Patterns and Packings*** Professor C.M. Series
- ***Giraffe Blood Flow and Pattern forming Bacteria*** Professor T.J. Pedley
- ***Marrying, Voting, Choosing*** Dr T.W. Körner

Earlier videos can be hired at £5 per video.

To place an order please contact Lee-Anne Taylor, London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HS (tel: 020 7637 3686 fax: 020 7323 3655, email: taylor@lms.ac.uk) or visit the website www.lms.ac.uk.

## LMS PROGRAMME AND CONFERENCE FUND

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

| Date/Venue | Title | Organizer/e-mail |
|---|---|---|
| 15 December 2003<br>Bath | Folding Patterns in Structural Geology, Theory & Experiments | C.J. Budd, G.W. Hunt<br>cjb@maths.bath.ac.uk<br>ensgwh@bath.ac.uk |
| 19 December 2003<br>Leicester | Will Light Conference on Approximation Theory and Applied Analysis | J. Levesley<br>Jl1@mcs.le.ac.uk |
| 24 – 27 March 2004<br>Swansea | Strings, Gauge Fields & Duality – conference to mark the retirement of David Olive, CBE, FRS | G. M. Shore<br>g.m.shore@swansea.ac.uk |
| 31 March – 2 April 2004<br>Southampton | Applications of K-theory & Cohomology | J. Brodzki<br>j.brodzki@maths.soton.ac.uk |
| 20 – 22 April 2004<br>QMUL | 15th Postgraduate Combinatorial Conference | R. F. Bailey<br>r.f.bailey@qmul.ac.uk |
| Summer 2004<br>Oxford | Three Dimensional Geometry & Topology | M. Lackenby<br>lackenby@maths.ox.ac.uk |
| 14 – 15 June 2004<br>East Anglia | Mathematical Modelling of the Global Ocean | N. Riley<br>n.riley@uea.ac.uk |
| 12 – 16 July 2004<br>Newcastle | Workshop in Operator Theory & its Applications | M. Dritschel<br>m.a.dritschel@ncl.ac.uk |
| 14 – 18 September 2004<br>Reading | 3rd International Conference on Boundary Integral Methods: Theory & Applications | I. Graham<br>i.g.graham@bath.ac.uk |
| 4 – 7 April 2005<br>Liverpool | Joint BAMC/BMC | P.J. Giblin<br>pjgiblin@liverpool.ac.uk |
| 11 – 15 July 2005<br>Cambridge | 5th International Conference on Inverse Problems in Engineering: Theory & Practice | D. Lesnic<br>amt5ld@amsta.leeds.ac.uk |
| 25 – 29 July 2005<br>Gregynog Hall, Powys | 5th Gregynog Workshop on Computational Techniques in Spectral Theory & Related Topics | B.M. Brown<br>Malcolm@cs.cf.ac.uk |

## INVITED LECTURES 2003

### Professor Masatoshi Fukushima

The LMS Invited Lectureship 2003, which was awarded to Professor Masatoshi Fukushima, Osaka, was hosted by the Department of Mathematics of the University of Wales Swansea.

Professor Fukushima is famous for his seminal result that with every (symmetric) L2-sub-Markovian semigroup a Hunt process is associated. The key observation is that we can use the potential theory of Dirichlet forms due to A. Beurling and J. Deny in order to control exceptional sets. Moreover, Professor Fukushima's theory allows the development of a stochastic calculus based on analysis in Hilbert spaces. Professor Fukushima was invited for a talk at the ICM 1978, Helsinki, and for his most recent work he was awarded the prestigious Analysis Prize of the Mathematical Society of Japan in 2003.

His LMS lecture series 'Time changes of symmetric Markov processes and related analysis' was in fact devoted to his latest, prize-winning work, and Professor Fukushima has already decided to publish an extended version of his lectures in the LMS Lecture Notes Series.

Professor Masatoshi Fukushima

Our intention in Swansea was to attract many PhD students and postdocs working in the field (and related areas) and we succeeded in welcoming about 20 of them, thanks to the support of the LMS. While most of them were from the UK, there were also younger participants from Canada, Germany, Norway, Poland, Ukraine and the USA. In addition 10 more senior colleagues participated in the lectures.

Some of the participants enriched the programme by giving additional lectures in the afternoon. In particular Professor Krzysztof Bogdan, Wroclaw, was invited to give two lectures on his recent research which is close to the topic of Professor Fukushima's recent investigations.

Niels Jacob
Swansea

University of East Anglia
School of Mathematics

**Chair in Pure Mathematics**

Vice-Chancellor David Eastwood and the academic leadership of UEA have created 16 new full professorships as part of their drive to maintain and enhance the University's reputation as one of Britain's premier research-led institutions. One of these posts is the Chair in Pure Mathematics.

We are seeking to appoint a Professor of Pure Mathematics. The School of Mathematics has a strong research reputation in Logic, Algebra & Combinatorics, Number Theory & Ergodic Theory, and obtained a 5A rating in the last two RAEs. Candidates should have an established record of internationally leading research activity. Preference may be given to candidates whose research interests are compatible with existing strengths in the School.

Further particulars and an application form can be obtained from the Personnel Office, University of East Anglia, Norwich NR4 7TJ (web: www.uea.ac.uk/personnel/jobs/ or email: personnel@uea.ac.uk or answerphone: 01603 593493) to be returned by **1 December 2003**. Please quote reference **AC488**.

## EUROPEAN MATHEMATICAL SOCIETY NEWS

Although the European Mathematical Society (EMS) was successful in influencing the shape of the 6th Framework Programme, it was not successful in its four applications for funding from the Programme. Only one looks as if it will have a reasonable chance in the second round. That is the one for Summer Schools and Meetings, so if it succeeds the EMS will be able to stimulate an expanded programme of events in the next few years.

Despite its lack of success with other applications, the EMS is determined to press ahead with as many activities as it can, using its own funds and what other sources it can find. For example, in the past UNESCO has helped to defray the expenses of mathematicians from Eastern Europe who attend our

LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

**Department of Mathematics**
**Two Lectureships in Mathematics**

**Salary range**
**£25,430 – £35,813 pa inc**
**(pay award pending)**

The Department of Mathematics is seeking to appoint two Lecturers in Mathematics, to start on or before 1 September 2004. The Department is launching an MSc in Applicable Mathematics in 2004, and these are new posts associated with that initiative.

Applications are invited from candidates with proven research ability in Mathematics. We particularly encourage applicants whose research relates to the LSE's focus on the Social Sciences, including Economics, and/or with expertise in Mathematics related to Algorithms and Computation.

For further details please see www.maths.lse.ac.uk/lectureship.html. Alternatively, please phone 020 7955 6183 or email recruitment@lse.ac.uk quoting reference 07/03/AC.

Further information about the Department can be found at www.maths.lse.ac.uk.

**Closing date for completed applications: 24 November 2003.**

Summer Schools, and we very much hope this will continue. In that light, the EMS has just issued a call for proposals for EMS Lectures, Joint Mathematical Weekends, and Summer Schools (see EMS Newsletter 49 or www.emis.de/tmp2.html).

The first Joint Mathematical Weekend was held at Lisbon in September. Run by the Portuguese Mathematical Society, it brought together mathematicians from many countries working in five particular areas of mathematics, with a mix of plenary and parallel specialist lectures. Since the Executive Committee held its own meeting immediately afterwards, I went to part of the Mathematical Weekend and can vouch for its success.

For these, and our other activities, we need the moral support of individual members (now about 2,400) as well as national societies. So do take the opportunity to join when renewing your LMS subscription.

David Salinger
EMS Publicity Secretary

## BOOK REVIEW

**Imagining numbers (particularly the square root of minus 15)** Barry Mazur, 2003, Allen Lane, ISBN 0 713 99630 7, xvi + 270 pp, £9.99.

In *Imagining numbers* Barry Mazur sets out to explore how the act of imagining in reading and understanding poetry relates to imagining in mathematics, and as his example of the latter he looks at the concept of complex numbers, as they first appeared in the sixteenth century and as they were represented geometrically by Argand and others some two hundred and fifty years later.

The book is written, Mazur claims, for those with no training in mathematics. Therein lies his greatest difficulty. Mathematicians are likely to find the book frustrating because there are just too many pages of elementary calculation to skim through before one gets to the heart of the story. I cannot speak for non-mathematicians, except that the one I

(cont'd)



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The Honors Class:
Hilbert's Problems and Their Solvers
Ben Yandell
January 2004; ISBN 1-56881-216-7
Paperback; 496 pp.; £13.50
"Yandell writes well and has done a good job of researching these stories, supplementing the standard written sources with interviews and photographs. The resulting profiles are interesting, readable, and insightful. Along the way, the reader gets some of the actual mathematics, but the most important message is really about the people: how brilliant they were, how passionate about mathematics, and sometimes how strange and eccentric, as well."
– SCIENCE Vol. 296; May 3 2002



Susanne Schmitt / Horst G. Zimmer
Elliptic Curves
A Computational Approach
2003. Approx. x, 361 pages. Hardcover.
€ 78.00 [D] / sFr 125.00 / US$ 79.95
ISBN 3-11-016808-1
(de Gruyter Studies in Mathematics 31)
The basics of the theory of elliptic curves should be known to everybody, be he (or she) a mathematician or a computer scientist. Especially everybody concerned with cryptography should know the elements of this theory.
The purpose of the present textbook is to give an elementary introduction to elliptic curves. Since this branch of number theory is particularly accessible to computer-assisted calculations, the authors make use of it by approaching the theory under a computational point of view. Specifically, the computer-algebra package SIMATH can be applied on several occasions.
The contents is kept as elementary as possible. In this way it becomes obvious in which respect the book differs from the numerous textbooks on elliptic curves nowadays available.

Herbert Heyer, Niels Jacob and Ivan Netuka
Heinz Bauer: Selecta
2003. xiv, 597 pages.
1 frontispiece. Hardcover.
€ 128.00 [D] / sFr 205.00 / US$ 118.95
ISBN 3-11-017350-6
Heinz Bauer (*1928) is one of the prominent figures in Convex Analysis and Potential Theory in the second half of the 20th century. The Bauer minimum principle and Bauer's work on Silov's boundary and the Dirichlet problem are milestones in convex analysis; axiomatic potential theory owes him what is known by now as Bauer harmonic spaces.
From the contents:
Twenty-two research papers and five surveys on Measure and Integration Theory, Convex Analysis, and Potential Theory, including: Minimalstellen von Funktionen und Extremalpunkte, Silovscher Rand und Dirichletsches Problem, Axiomatische Behandlung der Potentialtheorie (Theorie der harmonischen Räume), Theorems of Korovkin type, Heat Balls and Fulks Measure, Fine Boundary Limits of Harmonic and Caloric Functions, Simplices in Potential Theory.

de Gruyter Mathematics

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am married to thought the idea was potentially interesting but found the text immediately too difficult. He admitted that he was probably being lazy, but I wonder how many non-mathematicians really want to know how to solve cubic equations – why should they? – or care about the numbers needed for the solution.

I write here from a third standpoint, that of a historian of mathematics, deeply interested in the question of how mathematical concepts arise, how they seemed and what they signified to those who first struggled with them. Here I would take issue with two underlying assumptions in Mazur's book. The first is that those who first worked with complex numbers were somehow baffled by them; Mazur writes of a 'continued mistrust', which he seems to think lasted for most of the three centuries of the time span of his book. The second is that a few mathematicians in the early nineteenth century at last cast light into the darkness and enabled mathematicians to work with $\sqrt{-1}$ with ease and confidence, and that the efforts of earlier mathematicians were no more than groping towards this final leap of imagination.

Mazur emphasizes that he is not writing a historical account. This is a pity because from a historical perspective a rather different picture emerges. To begin with, it is clear that Raffaele Bombelli in Italy by 1572 and Thomas Harriot in England by about 1600 recognized the need for complex numbers, and operated with them using the simple fact that $(\sqrt{-1})^2 = -1$, without concerning themselves too much with questions of existence and meaning. Students meeting complex numbers for the first time today do exactly the same thing. The 'meaning' of complex or any other numbers is a difficulty for those who know rather a lot of mathematics, not for those who do not.

By the mid seventeenth-century John Pell had investigated the solutions of $x^2 - 6x + N = 0$ for different values of N and noted that as N passed through 9 and upward, the roots become more and more 'impossible' (though that did not prevent him from cheerfully writing them down). A few years later John Wallis also saw complex roots as the 'measure of impossibility' of an equation, and the imaginary part as an indication of how far the roots must be moved away from the real number line and out into the plane. Wallis also gave a construction for $\sqrt{-ab}$ as the geometric mean of $a$ and $-b$, leading him to see real numbers in terms of sines (and cosines), imaginary numbers in terms of tangents (and secants), and thus the hyperbola as a kind of imaginary ellipse. This, it seems to me, is a wonderfully rich piece of mathematical imagining, and not impossible to present to a lay reader.

Wallis's treatment laid the groundwork for later representation, but Mazur flies over all this with barely a downward glance. Instead he beams us like Star Trek characters straight from the sixteenth century to the nineteenth, leaving us wondering how Argand's 'solution' resolves what he calls Bombelli's 'puzzle'. The answer is that it does not, for Mazur is not following Bombelli's agenda but his own. And once he has arrived at Wessel's and Argand's representation of complex numbers he comes to an abrupt halt, as though any later and different representation was not part of the same imaginative story.

The redeeming feature of Mazur's book is that it is not just about mathematics but about poetry, and here mathematician and non-mathematician alike can engage with it. And here Mazur offers much that is delightful, surprising and entertaining, so much so that I frequently wished he would stop labouring the mathematics and just write about poetry. This is clearly an area in which he is an enthusiast and has much to say. To bring mathematics and poetry together was a courageous aim, and Mazur is to be commended for trying. If he has not succeeded it is perhaps because he has not paid as much attention to the inner perceptions and struggles of mathematicians as he has to those of writers and poets.

Jackie Stedall
The Queen's College, Oxford



The Open University

# CALLING ALL MATHEMATICIANS

At the Open University Department of Psychology, we are carrying out a research study on the personality, lifestyle and health of people with different vocations and interests. One group of special interest is mathematicians, and we are currently seeking participants. Anyone is welcome, as long as they are a mathematician or have a strong interest in mathematics.

All you have to do is fill in a questionnaire, which we post to you and takes about half an hour. We will we send you a £5 Marks & Spencer token to thank you for your time. The questionnaire is anonymous and confidential. Your name and address will not be stored and you will not be recontacted.

If you would like a questionnaire pack, please email
socsci-leq-study@open.ac.uk
or visit the study website at
http://www.open.ac.uk/socialsciences/les/

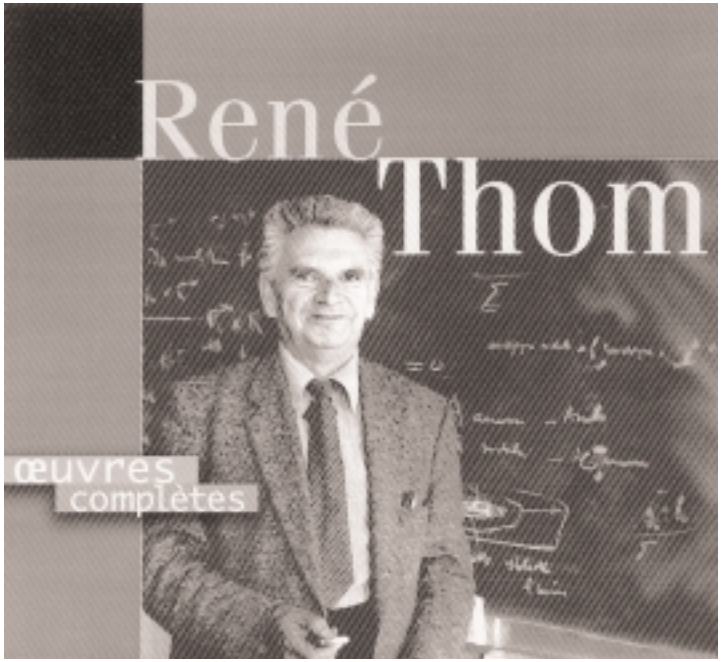
## *LES ŒUVRES COMPLÈTES DE RENÉ THOM*

On 25 October 2002, René Thom passed away. In his lifetime he produced major scientific works covering many different subjects. The first edition of René Thom's Complete Works is now available on the CD-ROM *Les Œuvres Complètes de René Thom* which includes 370 articles and prefaces, six books, a lot of unpublished material, scientific letters, thesis reports, reports on famous mathematicians written on the occasion of prize reports and annual scientific reports written by René Thom.

To make it possible for the largest number of people to acquire it, a subscription limited to individuals has been launched, offering the CD-ROM at the price of €60. Only 1000 copies are available at this price.

If you are interested in subscribing to the 'Complete Works', or if you know someone who is, we suggest that you download the subscription form (a pdf file) from the IHÉS site at the following address: www.ihes.fr/~cdthom. (There you will also find a presentation of the CD-ROM written by the IHÉS director, Jean-Pierre Bourguignon.) Orders will be delivered within one week upon receipt of the subscription form and the payment. Please use electronic means of transmission if possible.

If you would like further information, you can send an email to Souscription-cdthom@ihes.fr or get in touch with Sylvie Grare at +33 1 60 92 66 71 (Tuesday to Thursday only) or with Élisabeth Jasserand at +33 1 60 92 66 04.




We hope that these *Œuvres Complètes* will give you an opportunity to discover, or rediscover, the creative spirit and the manifold dimension of René Thom.

Jean-Pierre Bourguignon
Director, IHÉS



## INSTITUT DES HAUTES ÉTUDES SCIENTIFIQUES

The Institut des Hautes Études Scientifiques, located in Bures-sur-Yvette (France), welcomes each year 200 to 250 mathematicians and theoretical physicists from all over the world and for various periods (2 or 3 weeks up to 1 or 2 years).

Created in 1958, the IHÉS is a private foundation of international standing with the purpose of supporting and developing theoretical research in pure mathematics, theoretical physics and more recently, molecular biology. The IHÉS is financed by the French Ministère de la Recherche, some European research agencies such as the Engineering and Physical Sciences Research Council (EPSRC) in the United Kingdom, the US National Science Foundation, the European Union, and several French and foreign foundations and companies. In February 2000, the European Commission acknowledged the IHÉS as a Large European Research Infrastructure centre.

**Director:** Jean-Pierre Bourguignon
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**Louis Michel Chairs:** Michael Douglas, Jürg Fröhlich, Samson Shatashvili
**Long-term CNRS visitors:** Ofer Gabber, Dirk Kreimer, Christophe Soulé
**External Members of the Scientific Committee:** Alain Connes, Bernard Derrida, Curtis Callan, Michael Green, Stanislas Leibler, George Papanicolaou, Michael Rapoport

### WILLIAM HODGE FELLOWSHIPS: 2004/2005

EPSRC has now been supporting the IHÉS for a number of years and decided in 2000 to foster closer links between British institutions and French mathematical research centres of excellence. British mathematicians and theoretical physicists are invited to apply to the IHÉS to visit and additionally to use the opportunity to visit research groups in the Paris region. More information is given on the IHÉS website. In addition, the EPSRC and the IHÉS are offering annually two 1-year fellowships under the name of Sir William Hodge, the eminent British mathematician whose main interests were in algebraic and differential geometry. The fellowships will enable outstanding young mathematicians and theoretical physicists to spend time at the IHÉS.

#### Conditions for application

PhD in Mathematics or Theoretical Physics obtained in 2001 or later. One of the two grants will be exclusively awarded to an applicant who has received his/her PhD from a UK University or has spent the last year in a UK university.

#### Selection of applicants

Applications will be reviewed and selection made based only on the criterion of excellence by the IHÉS Scientific Committee on 17 January 2004. This Committee consists of the permanent professors, the Director, and some external members (names are listed above).

#### Starting date of the fellowships

Autumn 2004.

#### How to apply

The application file should be sent through the IHÉS website (www.ihes.fr) and should include: a motivation letter, a CV, a publication list, a research project and two or three letters of recommendation. The deadline is **31 December 2003**.

#### Information

IHÉS, 35 route de Chartres, F-91440 Bures-sur-Yvette, France.
Tel: +33 1 6092 6600, fax: +33 1 6092 6669, email: hodge@ihes.fr, website: www.ihes.fr

# LONDON MATHEMATICAL SOCIETY CECIL KING TRAVEL SCHOLARSHIP

The London Mathematical Society annually awards a Cecil King Travel Scholarship in Mathematics to the value of £5000, to a young mathematician of outstanding promise, to support a period of study or research abroad for a typical period of three months. Many mathematicians have found that such a visit has benefited both their mathematics and their career; the Society urges young mathematicians and their supervisors to consider seriously this opportunity.

The award is competitive and based on a written proposal describing the intended programme of study or research abroad and the benefits to be gained from such a visit.

Applicants should normally be nationals of the UK or Republic of Ireland, under the age of 25 years, either registered for or having recently completed a doctoral degree at a UK University.

The initial application should include:

1. A completed application form.
2. A short proposal (4 pages maximum) indicating the proposed programme of study abroad, the benefit of such an opportunity in advancing the candidate's studies, and the Institution that the candidate wishes to visit.
3. A letter of support from the applicant's Head of Department, or from his or her Research Supervisor.

Candidates selected for interview will be asked to approach the intended research institution or research leader to be visited, to confirm that a visit would indeed be welcomed if an award were made.

At the end of the Scholarship, the student will be expected to write a short report indicating the activities and benefits gained from the visit.

The Cecil King Travel Scholarship was established in 2001 by the Cecil King Memorial Fund. The award is made by the Council of the London Mathematical Society on the recommendation of the Cecil King Prize Committee, nominated by the Society's Education Committee.

Application forms for the 2004 Scholarship are available on the Society's website (www.lms.ac.uk/activities/cecil_king/index.html) or from the Society. Closing date for applications: **4 February 2004**.

The London Mathematical Society (ref: Cecil King/FS), De Morgan House, 57-58 Russell Square, London WC1B 4HS (tel: 020 7637 3686; email: spoor@lms.ac.uk).



# BRITISH APPLIED MATHEMATICS COLLOQUIUM 2004

## School of Mathematics, University of East Anglia, Norwich

## 19 - 22 April 2004

The mathematicians at UEA welcome BAMC delegates to our Norwich campus. The compact conference venue is set in beautiful grounds. The programme covers all aspects of applied mathematics research. PhD students are especially welcome to contribute and there are prizes for the best student talks.

### Plenary speakers

- F. Dias (Ecole Normale Supérieure)
- P. Haynes (Cambridge)
- S. Howison (Oxford)
- G.A. Maugin (Paris VI)
- D.T. Papageorgiou (New Jersey Institute of Technology) [Stewartson Memorial Lecture]
- E. Tuck (Adelaide) [IMA Lighthill Lecture]

### Minisymposia

- Geophysical fluid dynamics
- Free boundary problems
- Waves in solids
- Biomechanics
- Waves and flow stability
- Diffraction

There is ensuite accommodation on campus. The banquet will be held in the medieval splendour of St Andrew's Hall in central Norwich.

### Registration

The closing date for registration is **Friday 27 February 2004**. The website, electronic registration and further details are at: www:mth.uea.ac.uk/BAMC or contact: BAMC2004, School of Mathematics, UEA, Norwich NR4 7TJ (fax +44 (0) 1603 593 868, email bamc@mth.uea.ac.uk).

### Organising Committee BAMC2004

Jean Marc Vanden Broeck (Chair), Nigel Scott (Treasurer), David Stevens, Paul Hammerton, Mark Blyth, Mark Cooker (Secretary).

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# 44TH INTERNATIONAL MATHEMATICAL OLYMPIAD 2003 IN JAPAN

This annual competition was held in Tokyo in July. Each nation may send up to six students, and almost all nations send full teams. Students must be under 20 years old and not have entered full-time tertiary education in order to participate. A total of 82 nations took part this year.

Students sit two examinations on consecutive days. Each exam lasts 4 hours 30 minutes, and contains three questions. Each question is marked out of 7, so the maximum mark for a student is 42 and for a nation is 252. The jury attempts to set questions in order of increasing difficulty on each day. An incomplete answer will rarely secure more than 2 marks (for substantial progress).

The top half of the students receive medals of colour gold, silver and bronze in the ratios 1:2:3. The United Kingdom Team delivered its best performance since 1996. All six students obtained medals, and Paul Jefferys (Berkhamsted Collegiate School) secured our first gold medal since 1997 with a score of 29. Paul is now entering his final school year. Only one mark behind came Jenny Gardner (Tiffin Girls' School). She just fell below the borderline and obtained a silver medal. Her score was the 5th best among the girls of the world. Martin Orr (Methodist College, Belfast) clawed his way to a silver medal with 19 marks. He is about to enter the sixth form, so we have strong hopes for Martin over the next couple of years. His medal is the best ever from any resident of Ireland, whether playing for the UK or for the Republic. Gavin Johnstone of Dame Alice Owen's School just missed a silver by scoring 18, and both Nathan Bowler (Knutsford High School) and David Fidler (Haberdashers Askes) obtained bronze medals with 17. Bronze medals were awarded to all students who scored more than 12.

The UK's results are the more remarkable when one considers the differences between the participating countries. Some nations have elite boarding schools where the most academically talented students are given an education tailored to their abilities; such students clearly have an edge. When the IMO is viewed as a competition between nations (which officially it is not) then one must recognise the wildly differing sizes of the nations, which is not taken into account in the scoring. Brazil, China, India, Indonesia, Russia and the United States all have vast populations, and when such countries can efficiently locate their most talented young mathematicians, one would expect them to perform very well.

Here is the unofficial IMO ranking of the nations in 2003, together with their total scores.

1 Bulgaria (227)
2 China (211)
3 USA (188)
4 Vietnam (172)
5 Russia (167)
6 South Korea (157)
7 Romania (143)
8 Turkey (133)
9 Japan (131)
10=Hungary, United Kingdom (128)
12=Canada, Kazakhstan (119)
14 Ukraine (118)
15 India (115)
16 Taiwan (114)
17=Germany, Iran (112)
19=Belarus, Thailand (111)
21 Israel (103)
22 Poland (102)
23 Serbia and Montenegro (101)
24 France (95)
25 Mongolia (93)
26=Australia, Brazil (92)
28=Argentina, Hong Kong (91)
30=Greece, Moldova (88),
32 Georgia (86)
33 Croatia (80)

34 Czech Republic (79)
35 Slovakia (77)
36 Singapore (71)
37=Belgium, Indonesia (70)
39 Colombia (67)
40 Azerbaijan (66)
41 Mexico (64)
42 Norway (62)
43=Armenia, Bosnia-Herzegovina (61)
45 South Africa (60)
46 Spain (59)
47 Macedonia (54)
48 Sweden (52)
49=Italy, Kyrgyzstan, Latvia (50)
52=Lithuania (49), Uzbekistan (49)
54 Estonia (47)
55=Finland, Morocco, New Zealand (43)
58 Macau (40)
59 Austria (38)
60=Peru, Turkmenistan (37)
62=Iceland, Trinidad and Tobago (33)
64 Netherlands (30)
65 Uruguay (29)
66 Denmark (27)
67=Malaysia, Switzerland (26)
69 Luxembourg (25)
70=Albania, Cyprus, Puerto Rico (23)
73 Portugal (22)
74 Ireland (21)
75 Slovenia (18)
76 Cuba (14)
77 Ecuador (11)
78 Venezuela (10)
79 Philippines (9)
80 Kuwait (8)
81 Sri Lanka (4)
82 Paraguay (0)

In recent years, China has usually been ranked first, and the achievement of Bulgaria (population 7.6 million) in climbing to first position in 2003 is remarkable.

The contest between the large economies of the European Union is a fair fight. France, Germany, Italy and the UK have comparable populations, GDPs and social attitudes. None of these nations provides a separate education for its best young mathematicians. The UK team managed to knock Germany off its perch as leading EU nation for the first time since 1996 (when the UK ranked an amazing 5th, one point behind Russia and one point ahead of China). When Hungary enters the EU in 2004, this competition will cease to be a two horse race.

In the period strictly between 1997 and 2003 the UK performance did not match the impressive results of earlier years. We have addressed this problem by introducing a UK IMO squad training system, with training camps, regular practice examinations and problem sheets. In 2003 this included a camp in Australia just prior to the IMO (longitude training). The UK team flew to Japan free of jet lag, unlike most of its rivals.

Students are invited into this squad on the basis of their performance in national mathematics competitions, especially the British Mathematical Olympiad. We must gratefully acknowledge the support of various sponsors, including the Department for Education and Skills, ARM, Trinity College Cambridge, the University of Bath, Springer Verlag and our parent bodies the BMOS and UKMT. I thank my retiring deputy, Mr Richard Atkins (Oundle School) for his tremendous work.

The next four IMOs will be held in Greece, Mexico, Slovenia and Vietnam respectively.

Geoff Smith, UK IMO Team Leader
University of Bath
www.bath.ac.uk/~masgcs/ukimo2003/

## FROM THE OBSERVER

In 'Romping all over the world' (Review, 14 Sept) we attributed a national sex survey to the International Congress of Mathematicians. We meant the polling body ICM (Independent Communication and Marketing Research). Apologies to both organisations.





# 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 Society urges readers to consider suitable applicants and to bring this advertisement to their attention.

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

# WARWICK MATHEMATICS INSTITUTE

## SYMPOSIUM 2003/2004

**Noncommutative Algebra and its Applications**
Organisers: C. R. Hajarnavis & D. Rumynin

**Symposium Workshops**
8-13 December 2003 *Representations of Finite Dimensional Algebras*
Organisers: S. Konig & D. Rumynin

29 March-3 April 2004 *Representations of Finite Dimensional Algebras*
Organisers: K. Brown & D. Rumynin

May or June 2004 (dates to be confirmed) *Ring Theory and Algebraic Geometry*
Organisers: C. Ingalls & M. Reid

24-26 June 2004 (to be held at the University of Wales at Swansea) *Hopf Algebras*
Organiser: T. Brzezinski

5-16 July 2004 *Noncommutative Algebra*
Organisers: C. R. Hajarnavis & D. Rumynin

**Workshop 2003/2004**
18-21 May 2004 *Random Matrices and Probability*
Local Organiser: Neil O'Connell
This is a satellite workshop of the Isaac Newton Institute programme on 'Random Matrix Approaches in Number Theory'.

**Interdisciplinary Programme for Cellular Regulation (IPCR)**
This major new interdisciplinary research initiative at Warwick, funded by EPSRC and BBSRC, includes a series of seminars and conferences at the interface of mathematics, statistics and biology. Programme organisers: N.J. Burroughs, D. Rand (Mathematics) and A.J. Millar (Biology). See the website www.maths.warwick.ac.uk/ipcr for details.

## SYMPOSIUM 2004/2005

**Mathematics of Quantum Systems**
Organiser: Gero Friesecke

There will be introductory workshops in September 2004 followed by other events throughout the year. See our website for details.

For further information contact:
Mathematics Research Centre, University of Warwick, Coventry, CV4 7AL.
E-mail: peta@maths.warwick.ac.uk
Phone: +44 (0)24 7652 4403
Fax: +44 (0)24 7652 3548
Web: www.maths.warwick.ac.uk/events.html



# 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).

## NOVEMBER 2003
**1** North British Functional Analysis Seminar, Nottingham University (319)
**3** K-Theory Day, Oxford University (320)
12 Sharing of Projects Practice Workshop, York University (319)
**15** Belfast Functional Analysis Day, Queen's University Belfast (315)
**15** History in the Undergraduate Mathematics Curriculum Workshop, Oxford (319)
**21** LMS Annual General Meeting and Naylor Lecture, London (320)
**23-27** Remarkable Delta '03 Conference, Queenstown, New Zealand (314)
**29** SECANTS, Royal Holloway (320)

## DECEMBER 2003
**8-12** Stochastic Methods in Coagulation and Fragmentation EuroWorkshop, INI, Cambridge (314)
**12** Patterns, Nonlinear Dynamics and Applications Meeting, Cambridge University (320)
**16-18** Cryptography and Coding IX, IMA Conference, Cirencester (319)

## JANUARY 2004
**7** LMS Meeting at the AMS, Arizona, USA (430)
**9** UK & Republic of Ireland SIAM Section Annual Meeting, Sheffield University (316)
**10-11** New Frontiers in Computational Mathematics Workshop, Manchester University (318)
**20** 400 Years of British Mathematics Meeting, Open University (319)
**20-23** Towards a Predictive Biology Conference, INI, Cambridge (316)

## FEBRUARY 2004
**20** LMS Mary Cartwright Lecture, London

## MARCH 2004
**29-1 Apr** Modelling Permeable Rocks IV, IMA Conference, Southampton University (319)
**31-2 Apr** Quantitative Modelling in the Management of Healthcare IV, IMA Conference, Salford University (319)

## APRIL 2004
**5-7** Modelling in Industrial Maintenance and Reliability V, IMA Conference, Salford University (319)
**5-8** BMC, Queen's University, Belfast (315)
**19-22** BAMC, East Anglia University (320)

## MAY 2004
**12** LMS Midlands Regional Meeting, Nottingham
**28-31** Meeting in Honour of Professor Wong, City University, Hong Kong (319)

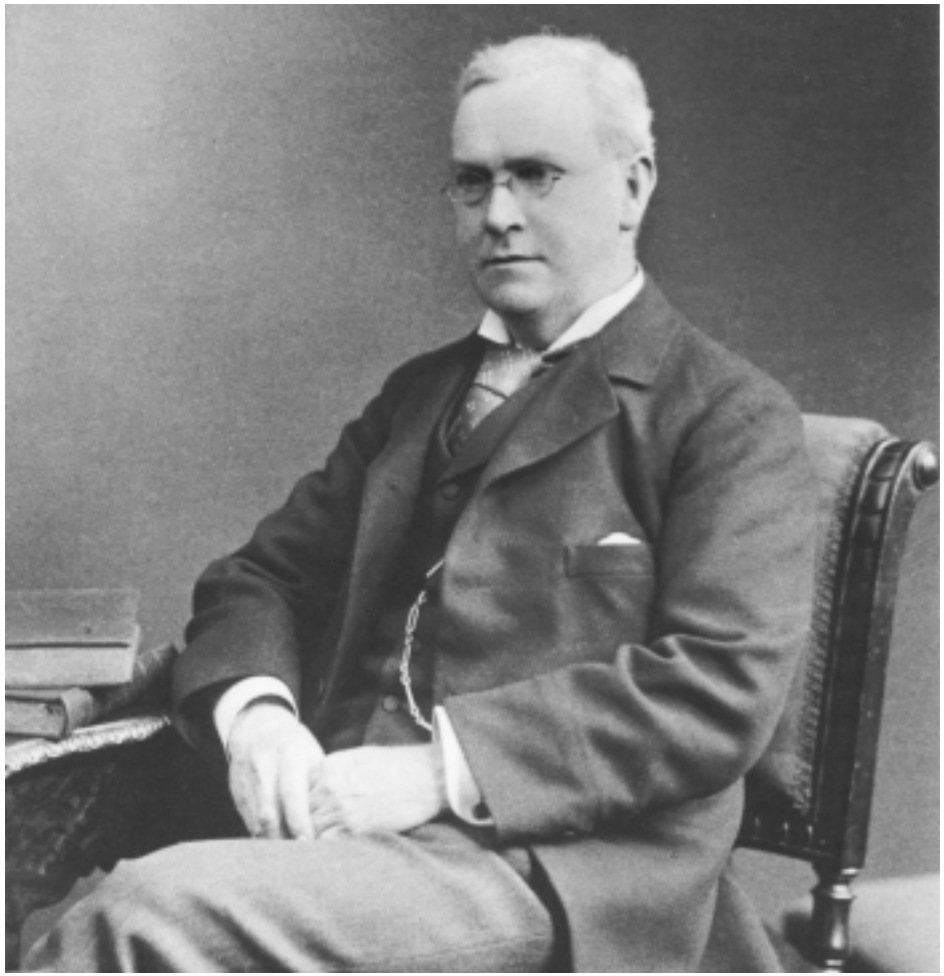
## JUNE 2004
**18** LMS Meeting, Hardy Lecture, London
**27-2 Jul** Fourth European Congress of Mathematics, Stockholm (315)
**28-30** Analysing Conflict and its Resolution, IMA Conference, Oxford (319)

## JULY 2004
**2** LMS Northern Regional Meeting, Newcastle University
**4-11** ICME 10, Denmark (308)
**12-16** IWOTA, Newcastle University

## SEPTEMBER 2004
**1-6** Pan-African Congress of Mathematics, Tunisia (308)
**14-18** Boundary Integral Methods III: Theory and Applications, IMA Conference, Reading University (319)

## DECEMBER 2004
**14-16** Mathematics in Signal Processing VI, IMA Conference, Cirencester (319)

# HORACE LAMB
# DE MORGAN MEDALLIST
# 1911



Professor Lamb received the De Morgan Medal on 9 November 1911. His major work was his book on hydrodynamics, which was first published in 1879 as a volume of 258 pages entitled *Treatise on the Motion of Fluids*, was transformed in 1895 into a volume of more than 600 pages with a new title *Hydrodynamics*, and was further expanded in 1906. *Hydrodynamics* incorporated versions of original papers by its author and unpublished work which complemented his account of the published work of others. In the 1895 edition he made a fundamental contribution to the dynamical theory of tides.