

# THE LONDON MATHEMATICAL SOCIETY NEWSLETTER

No. 280

March 2000

## FORTHCOMING SOCIETY MEETINGS

*Saturday 4 March 2000 - Cambridge*

Inaugural Mary Cartwright Lecture

*Friday 31 March-Saturday 1 April 2000 - Oxford*

Modelling Dynamics in the Life Sciences

*Friday 19 May-Saturday 20 May 2000 - Oxford*

Hilbert's Problems: Past and Future

Joint meeting with the

British Society for the History of Mathematics

*Friday 23 June 2000 - London*

M. Buhmann, M.J.D. Powell

## COUNCIL DIARY

21 January 2000

At the first meeting of the year we began by welcoming four new members of Council: Martin Bridson, David Preiss, John Cremona and the President-designate, David Crighton. (Our fifth new member, Trevor Stuart, was a casualty of the flu epidemic.) These were the first entrants to Council under the new system of elections introduced at November's AGM, and we reviewed the electoral process. One reason is that the Society's Statutes and Bye-Laws were not formulated with an eye to the finer points of electoral reform. The election has raised a number of technical issues which although generally unimportant need to be resolved. We received a detailed breakdown of the 7-stage iteration which had been required to obtain a conclusive result under the STV system. To the writer this has some whiff of black magic, and certainly is far from transparent - but probably is fairer in ensuring a proper representation of members' interests.

We had a lengthy report of a meeting between representatives of the LMS and our sister societies (IMA, RSS and ORS) and members of EPSRC, including its Chief Executive and Mathematics Programme staff. A major item on the agenda was the future method of funding PhD studentships. Discussions in the past have been centred on whether to retain the pool system or move to some kind of quota, but the proposed shift from standard studentships to 'Doctoral Training Accounts' could make the difference between practice in mathematics and in other disciplines even greater. The new accounts might permit studentships of longer duration, which would improve our international competitiveness, but to find an appropriate allocation mechanism for the special needs of mathematics remains a challenge.

Another item of discussion was the 'connectivity' of Mathematics, and we welcomed a proposal from EPSRC to



organise a meeting to promote connectivity between the mathematics and engineering communities.

The Librarian reported on the Society's archives. We have some interesting historical material which is currently stored at University College, at De Morgan House and elsewhere. A handlist will be made before making a decision on its future.

We received the Society's submission to the House of Commons Select Committee on Education and Employment, prepared by the Education Committee and President in response to the inquiry into higher education.

We learned of progress so far in setting up a regional structure for the Society; plans in the Midlands are already advanced, and steps are being taken in other regions.

Finally it was reported that preparations are in hand for the visit of the first Hardy Fellow, Professor P. Diaconis.

Tony Scholl

### HARDY FELLOW 2001

As was anticipated in the May 1999 *Newsletter* and confirmed in the June 1999 *Newsletter*, Council has decided to convert the Hardy Lectureship into a Hardy Fellowship. The Hardy Lecturer had an exhausting schedule, visiting the far corners of the United Kingdom, not given enough time in any one place, and it was therefore agreed to replace the Lectureship by a Hardy Fellowship, to be held for three to four months in a single place, with frequent visits to lecture at other institutions.

Council is delighted to announce the election of Persi Diaconis, Professor at Stanford University, to hold the first Hardy Fellowship from May to August 2001 at Queen Mary and Westfield College, London, where his host will be Professor Rosemary Bailey.

The Hardy Fellowship of course commemorates G.H. Hardy, former President and De Morgan Medallist, probably the Society's most loyal and stalwart member and the Society's great benefactor.

### TIES/SPRUCE 2000

For the first time, The International Environmetrics Society (TIES) and Statistics in Public Resources, Utilities and in Care of the Environment (SPRUCE) are holding a joint international meeting TIES/SPRUCE 2000. This will be held on the main campus of the University of Sheffield from 4 - 8 September 2000. The theme of the meeting will be **Current Environmental Issues: Quantitative Methods**.

Contributed papers on any relevant topic will be welcomed, and will be selected on the basis of Abstracts which have to be submitted on or before 15 July 2000. Details of how to submit and register can be found on the conference's web page (<http://www.shef.ac.uk/ties-spruce2000/>), or can be obtained from Mrs Marianna Keray, TIES/SPRUCE 2000, School of Mathematics & Statistics, Hicks Building, Hounsfield Road, Sheffield S3 7RH (tel: +44 (0) 114 222 3732, fax: +44 (0) 114 222 3739, e-mail: [ties.spruce@sheffield.ac.uk](mailto:ties.spruce@sheffield.ac.uk)).

Thanks to the generosity of the London Mathematical Society, financial help for TIES/SPRUCE 2000 may be available for PhD students studying in UK Universities. For details on how to apply please contact Mrs Marianna Keray (address above).

### VISIT OF PROFESSOR J.A. BONET

Professor Jose Antonio Bonet (Valencia) will visit functional analysts in Oxford, Reading and London in early March. He will lecture in the Mathematical Institute, Oxford on Tuesday 7 March at 5 pm; in the Mathematics Department at the University of Reading on the afternoon of Wednesday 8 March; and at Goldsmiths' College, London on Thursday 9 March at 4 pm. For further information e-mail [j.d.m.wright@reading.ac.uk](mailto:j.d.m.wright@reading.ac.uk) or [charles.batty@st-johns.oxford.ac.uk](mailto:charles.batty@st-johns.oxford.ac.uk) or [maa01chc.gold.ac.uk](mailto:maa01chc.gold.ac.uk). This visit is supported by the LMS scheme 2 grant.



# LONDON MATHEMATICAL SOCIETY

Two-day Meeting  
31 March - 1 April 2000, Oxford

## MODELLING SPATIOTEMPORAL DYNAMICS IN INTERACTING SYSTEMS

This meeting of the Society is open to all who are interested. In particular, it is hoped that it will bring together young mathematicians and established senior scientists in the field. Particular topics to be studied include developmental biology, cardiac physiology, neurobiology, ecology and epidemiology.

### FRIDAY

- 2.00 - 2.05 Opening  
2.05 - 2.50 Kees Weijer (Dundee) *Pattern formation in a biological excitable medium: The morphogenesis of Dictyostelium*  
2.55 - 3.40 Julian Lewis (ICRF, London) *Lateral inhibition, lateral induction, and vector fields: nearest-neighbour interactions and cellular patterning in the inner ear*  
3.45 - 4.30 Neil Ferguson (Oxford) *Modelling viral evolution: HIV, influenza & dengue fever*  
4.30 - 5.00 Tea  
5.00 - 5.45 Hans Othmer (Minnesota) *The mathematical and computational challenges inherent in using micro-scale data to understand macro-scale behaviour in biological systems*

### SATURDAY

- 9.00 - 9.45 Roger Traub (Birmingham) *High-frequency (>100 Hz) neuronal oscillations generated by a novel type of interaction between neurons: axon-axon gap junctions*  
9.50 - 10.35 Sasha Panfilov (Utrecht) *Spatiotemporal chaos in the heart*  
10.35 - 11.00 Coffee  
11.00 - 11.45 John Brindley (Leeds) *Climate, Cod and Calculus; Mathematics at Sea*  
11.50 - 12.35 David Rand (Warwick) *Explaining T cell recognition: how to obtain a timely, effective and safe response from low-affinity receptors*

Accommodation has been booked at Lady Margaret Hall; reservations will be held until **Friday 3 March**. A reception and dinner will be held at Lady Margaret Hall on the Friday evening at 7.00pm for 7.30pm. Those wishing to book accommodation or attend the reception and dinner should contact Miss Susan M. Oakes, London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HP (oakes@lms.ac.uk).

Some funds are available to contribute in part to the expenses of members of the Society or research students who wish to attend the meeting. Requests for support should be addressed to the Meetings and Membership Secretary, London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HP (requests should include an estimate of expenses and a very brief *curriculum vitae*; research students should include brief letters of endorsement from their supervisors).



# Regular & Chaotic Dynamics

**Regular and Chaotic Dynamics** is a quarterly peer-reviewed international scientific journal published in English. The journal was founded in 1996 by the Moscow State University, Moscow Centre for Continuous Mathematical Education, and Udmurt State University. Then in 1999 the Department of Mathematics of the Russian Academy of Sciences became a cofounder of the journal. Starting from the first issue of 2000 the journal is published jointly by Turpion Ltd. and the Department of Mathematics of the Russian Academy of Sciences in close cooperation with Udmurt State University. The journal publishes only original research results in the analysis of regular and stochastic behaviour in determined dynamic systems that arise in classical mechanics, physics and in other areas.

## INDEXED IN

Institute of Scientific Information (ISI). The journal is reviewed, cover-to-cover, by mathematical reviewing journals including Mathematical Reviews and Zentralblatt für Mathematik.

## EDITOR IN CHIEF:

V V Kozlov, Moscow State University

## MANAGING EDITOR:

AV Borisov, Moscow State University

## 2000 SUBSCRIPTION DETAILS

Volume 5, 4 issues per annum	Worldwide
Print	US \$ 350.00
Single issue	US \$ 90.00
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The following three packages are available at a discounted rate of 44% for the journal:

### Package A:

Sbornik: Mathematics, Vol. 191	
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## CONTENTS

In this mathematics journal, special attention is given to:  
Nonlinear Dynamics;  
Integrability and Nonintegrability of Dynamic Systems;  
Determined Chaos;  
Symmetries, Lie Algebras, and Hamiltonian Formalism;  
Fractal Dynamics;  
Selforganization Theory and Synergetics.

## AUDIENCE

Students, Postgraduate students;  
Research fellows;  
Post-doctoral workers;  
Lecturers and researchers across the modern applications of mathematics in mechanics, physics and other areas.

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## VISIT OF PROFESSOR R. MIYAOKA

Professor Reiko Miyaoka from Sophia University in Tokyo will visit the UK under a Scheme 2 grant of the London Mathematical Society. She will give talks as follows:

- Wednesday 29 March: *The homogeneity of isoparametric hypersurfaces*, University of Loughborough (local organiser Dr Eugene Ferapontov, e.v.ferapontov@lboro.ac.uk);
- Thursday 30 March: *The homogeneity of isoparametric hypersurfaces*, University of Hull (local organiser Dr Jurgen Berndt, j.berndt@maths.hull.ac.uk);
- Tuesday 4 April: *On developable hypersurfaces*, University of Durham (local organisers Dr John Bolton, j.bolton@durham.ac.uk, and Dr Lyndon Woodward, l.m.woodward@durham.ac.uk);
- Thursday 6 April: *Stability and other topics on minimal surfaces*, University of Warwick (local organiser Dr Mario Micallef, mm@maths.warwick.ac.uk).

## VISIT OF PROFESSOR A. BOETTCHER

Professor Albrecht Boettcher of the Technical University of Chemnitz, Germany, will be visiting the UK between 13 and 19 March. This visit is supported by the LMS scheme 2 grant. General enquiries to Professor E.B. Davies at KCL. Professor Boettcher will give the following programme of lectures:

- 13 March, Sussex: *The spectrum of the Cauchy singular integral operator* (contact: E.Shargorodsky@sussex.ac.uk);
- 14 March, Oxford: *The spectrum of the Cauchy singular integral operator* (contact: charles.batty@sjc.ox.ac.uk);
- 15 March, Oxford: *C\*-algebras and pseudospectra of large Toeplitz matrices* (contact: lnt@comlab.ox.ac.uk);
- 16 March, King's College London: *Condition numbers of unstable sequences of Toeplitz matrices* (contact: E.Brian.Davies@kcl.ac.uk);
- 17 March, King's College London: *The spectrum of the Cauchy singular integral operator* (contact: E.Brian.Davies@kcl.ac.uk).

## GRANTS FOR ATTENDING THE THIRD EUROPEAN CONGRESS OF MATHEMATICS

Council has set aside a sum of money to be used for making grants to Members of the Society who wish to attend the Third European Congress of Mathematics. Members of the Society who are eligible are expected to make an application to the Royal Society in the first instance. Royal Society grants are made to applicants presenting their own paper or poster or chairing a session. The deadlines for applications to the Royal Society are 1 March 2000 and 1 June 2000. Information and application forms can be found on the website (<http://www.royalsoc.ac.uk>).

Members who apply to the Royal Society and also wish to apply to the London Mathematical Society for a grant

may simply submit copies of their Royal Society applications to the LMS at the address below. Members who are not eligible for a Royal Society grant may apply on forms obtainable from the address below.

Applications should be sent to Miss S.M. Oakes, The Administrator, London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HP, to arrive before **14 April 2000**. They will be considered by a Council Committee and the outcome (if necessary conditional on the outcome of an application to the Royal Society) will be made known to the applicant by 12 May 2000.

J.S. Pym  
Council and General Secretary



## MATHEMATICS FOR LIVING

The Mathematics Education into the 21st Century Project, announce an International Conference on "Mathematics for Living" in Jordan, 18-22 November 2000. The Mathematics Education into the 21st Century Project was founded in 1986 to promote innovative ideas in all branches of Mathematics Education, and is co-ordinated by Dr Alan Rogerson and Professor Fayez Mina. The Project has planned a series of International Conferences to be held throughout the world leading into the next millennium. The first of these was held in Egypt in November 1999 and will be followed by Jordan in November 2000, Australia in August 2001 and Sicily in October 2002.

The Jordan 2000 conference theme is *Mathematics for Living* and should attract teachers and researchers in Mathematics Education from around the world. The organisers welcome papers (in English or in Arabic) that deal with all aspects of mathematics education and relate to innovative ways to help students and teachers deal with the problem of making mathematics more "alive", more "realistic" and more "accessible". This could take the form of a paper on

- problem solving
- use of technology
- new ways of assessment
- ways of dealing with cultural differences
- overcoming gender and social barriers
- improving the curriculum
- using the statistics of everyday life
- effectively utilizing new paradigms in teaching and learning

Likely registration fee: US\$250-300. For further details e-mail [arogerson@vsg.edu.au](mailto:arogerson@vsg.edu.au) or write to Mathematics Education into the 21st Century Project, 22 Violet Grove, Hawthorn, Victoria 3122, Australia. Places are limited so apply as soon as possible.

## ISAAC NEWTON INSTITUTE FOR MATHEMATICAL SCIENCES Call For Proposals

The Isaac Newton Institute for Mathematical Sciences invites new proposals for programmes for 2002 onwards. A choice of six-month, four-month or three-week programmes is available. The three-week short programmes, available during July and August each year, are intended for more narrowly focused topics or for subjects that may be at an embryonic stage of development, and for which a longer programme might not be as yet justified.

Proposals should be addressed to the Director, Professor H.K. Moffatt, Isaac Newton Institute for Mathematical Sciences, 20 Clarkson Road, Cambridge CB3 0EH, UK. Proposers should state whether they would prefer a four-month, six-month or three-week programme. The Institute is pleased to receive proposals at any time. The Scientific Steering Committee normally meets in April and October each year; proposals for consideration at the next meeting (October 2000) should be received by 30 June 2000.

Submission guidelines, and information about forthcoming programmes already selected, are available at <http://www.newton.cam.ac.uk/callprop.html>. Further information is also available from the Director (tel: 01223 335999; e-mail: [info@newton.cam.ac.uk](mailto:info@newton.cam.ac.uk)) who will answer any enquiries.

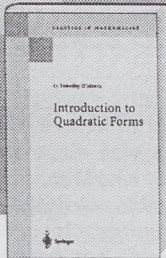
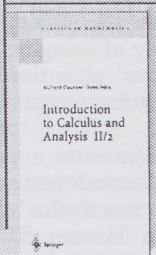
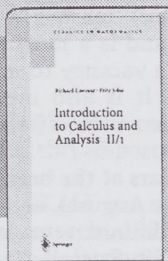
## VISIT OF J.P.N. BISHWAL

J.P.N. Bishwal from the Indian Statistical Institute, Calcutta, India will be visiting the Statistical Laboratory, Cambridge in the period 27 January - 27 March. This visit is supported by the LMS International Short Visits scheme. For further information contact Dr Dan Crisan, Statistical Laboratory, DPMMS, 16 Mill Lane, Cambridge CB2 1SB (tel: 01223 337946, fax: 01223 337956, e-mail: [d.crisan@statslab.cam.ac.uk](mailto:d.crisan@statslab.cam.ac.uk)).



# Back to the Future

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"Anyone who has heard O'Meara lecture will recognize in every page of this book the crispness and lucidity of the author's style... The organization and selection of material is superb... deserves high praise as an excellent example of that too-rare type of mathematical exposition combining conciseness with clarity..."

*Bulletin of the AMS*

Corr. 3rd printing 1999. XIV, 344 pp. 10 figs.  
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## NATHAN JACOBSON

Professor Nathan Jacobson, who was elected an Honorary Member of the London Mathematical Society on 17 February 1972, died on 5 December 1999, aged 89.

## MARY BRADBURN

Dr Mary Bradburn, who was elected a member of the London Mathematical Society on 13 December 1945, died on 31 January 2000, aged 81.

## EDWIN J. REDFERN

Mr Edwin J. Redfern, who was elected a member of the London Mathematical Society on 17 June 1988, died on 8 January 2000, aged 51.

## ADVERTISING IN THE LMS NEWSLETTER

An advertisement in the *Newsletter* for a post (from Postdoctoral Research Associate to Professor) reaches a very selective readership, and is a most effective way of bringing a vacancy to mathematicians' attention. It is also inexpensive - a whole page costs £160, a half page £85.

The *Newsletter* appears at the beginning of each month (except August), and copy should reach the Administrator at De Morgan House, 57-58 Russell Square, London WC1B 4HP (e-mail: [lms@lms.ac.uk](mailto:lms@lms.ac.uk)) by the beginning of the month prior to publication. The advertisement will also appear in the LMS website.

Please bring this opportunity to the attention of your Personnel Offices, or use it yourselves.



## UNIVERSITY OF SUSSEX

SCHOOL OF MATHEMATICAL SCIENCES

### *Lectureship in Pure Mathematics*

Ref 246

The University of Sussex invites applications for a permanent Lectureship in Pure Mathematics. The Lectureship is associated with the Centre for Mathematical Analysis and its Applications in the School of Mathematical Sciences and, in particular, with the Analysis Group whose focus for research is partial differential equations and their applications. The Group is being strengthened by the appointment of Dr K. Zhang to a Chair in Pure Mathematics from 1 August 2000, and by the promotion of Dr A V Sobolev to a personal Chair. An appointee from any branch of Analysis is sought, who will be an enthusiastic and energetic researcher and teacher, able to relate to the existing interests of the Group. The post is tenable from 1 September 2000 or an alternative date to be arranged.

Salary will be on either the Lecturer Grade A (£17,238 - £22,579) or Grade B (£23,521 - £30,065) per annum on the Teaching Faculty scales, according to qualifications and relevant experience.

Informal enquiries about the post may be made to the Dean of the School, Professor C M Goldie (email [C.M.Goldie@sussex.ac.uk](mailto:C.M.Goldie@sussex.ac.uk)). Further details of the post and the School's activities can be found on <http://www.maths.sussex.ac.uk/Posts>

Applications should include a full curriculum vitae and the names and addresses of three referees, and are needed by 31 March 2000 or as soon as possible thereafter.

Application forms and further particulars may be obtained from Liz Showler, Staffing Services Office, Sussex House, University of Sussex, Brighton BN1 9RH, England, tel (+44) 1273 877324, fax (+44) 1273 678335, e-mail [E.S.Showler@sussex.ac.uk](mailto:E.S.Showler@sussex.ac.uk). These documents are also available via the Web site above.

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# United Kingdom Mathematics Trust (UKMT)

## EXECUTIVE DIRECTOR

The UKMT has recently instituted the post of Executive Director, and now seeks to fill this important position.

The UKMT is a registered charity and was incorporated as a company limited by guarantee in 1996 "to advance the education of children and young people in mathematics and in particular . . . by organising and running mathematics competitions". It inherited responsibility for ten national competitions and related activities organised by various bodies and these have progressed since through significant voluntary contributions from school and university mathematicians assisted by a lean administrative function. The UKMT has been particularly successful in its first three years, both demonstrating its potential and creating a sound financial base from which to develop.

The Executive Director will assume a leadership role with responsibility for the UKMT's day-to-day activities, reporting to its Council through its Chairman. The role is evolutionary and the Council will expect the Executive Director to be energetic and creative in putting forward and implementing proposals to develop further these activities and the required organisational structure in pursuit of the Trust's objectives.

The prime qualification for the role is unbounded enthusiasm for the Trust's objectives. It is therefore most likely that the individual appointed will be well qualified in mathematics and currently teaching mathematics at university or school level but looking for a creative challenge through which to demonstrate other skills. Two other attributes are particularly important: as the UKMT's ambassador to schools, universities, government, potential sponsors and other outside bodies the Executive Director will need to display good marketing skills and, finally, will need the commercial and organisational skills to manage and develop the UKMT, combined with the sensitivity to maintain the goodwill of a large number of volunteers.

In recognising that this is a unique and evolutionary role, the UKMT is prepared to be as flexible as possible in order to attract the right candidate. In particular, in offering a contract for three years, the UKMT is prepared to contemplate a secondment and the possibility of an initial part-time role. Salary will be commensurate with the role and will be negotiable.

Enquiries from individuals on their own behalf, or suggestions of names of potential candidates, should be put in confidence to the Secretary of the UKMT, Dr Roger Bray, The Royal Institution, 21 Albemarle Street, London W1X 4BS, e-mail [brayr@ri.ac.uk](mailto:brayr@ri.ac.uk), telephone 020 7670 2906.



## EUROCONFERENCES IN MATHEMATICS ON CRETE

The Foundation for Research and Technology-Hellas (Institute of Applied and Computational Mathematics) in collaboration with the University of Crete (Department of Mathematics) will continue in 2000 the series Euroconferences in Mathematics on Crete, sponsored mainly by the Training and Mobility of Researchers Programme of the Commission of the European Union, with the following conferences.

**Numerical Methods for Evolution Partial Differential Equations** (24-30 June 2000). Organizers: G. Akrivis (Ioannina, Greece), M. Crouzeix (Rennes, France). Main speakers: T. Gallouet (Marseille, France), R. Nohetto (Maryland, USA), J. Rappaz (Lausanne, Switzerland), V. Thomée (Göteborg, Sweden), L. Wahlbin (Cornell University, USA).

**New Mathematical Methods in Continuum Mechanics** (22-28 July 2000). Organizers: J. Ball (Oxford, UK), S. Müller (Leipzig, Germany). Main speakers: A. Bressan (SISSA Trieste, Italy), G. Francfort (Paris-Nord, France), G. Friesecke (Oxford, UK), R. James (Minnesota, USA), V. Sverak (Minnesota, USA).

**Curves and Abelian Varieties over Finite Fields and their Applications** (29 July - 4 August 2000). Organisers: G. van der Geer (Amsterdam, Holland), R. Schoof (Rome, Italy). Main speakers: N. Elkies (Harvard University, USA), G. van der Geer (Amsterdam, Holland), R. Pellikaan (Eindhoven, Holland), R. Schoof (Rome, Italy), M. Tsfasman (Marseille, France).

**Discrete and Algorithmic Geometry** (19-25 August 2000). Organisers: G.M. Ziegler (Berlin, Germany), E. Welzl (Zürich, Switzerland). Main speakers: G. Kalai (Jerusalem, Israel), R. Seidel (Saarbrücken, Germany), J. Snoeyink (Vancouver, Canada), E. Welzl (Zürich, Switzerland), G.M. Ziegler (Berlin, Germany).

The conferences will take place at the Anogia Academic Village, a conference centre located at the traditional Cretan village of Anogia on the slopes of Mount Ida. Anogia is located at an elevation of 750 m, about 45 minutes by car from Heraklion, the largest city of Crete, and about half an hour from the closest coast. The living expenses (accommodation plus meals) per day for a person are estimated at about 32 Euro in a double room or 40 Euro in a single room. The registration fee amounts to 250 Euro.

The Training and Mobility of Researchers Programme financially supports young researchers from the countries of the European Economic Area and Israel, as well as researchers from certain countries in Central and Eastern Europe, to enable them to attend the conferences. There will be also some limited funds from other sources available to support participants not belonging to the above groups. Support can cover (all or certain) travel, living and registration expenses. For information please contact the local co-ordinator of the conference series indicated below.

The topics of the conferences, which will follow in the next years, will be decided by the international scientific committee consisting of: H. Abels (Bielefeld, Germany), C. Dafermos (Brown University, USA), J.-P. Kahane (Paris-Sud, France), O. Kegel (Freiburg, Germany), S. Papadopoulou (Crete, Greece), V. Thomée (Göteborg, Sweden), A. Wilkie (Oxford, UK).

For additional information contact the local co-ordinator: Susanna Papadopoulou, Department of Mathematics, University of Crete, Heraklion, Crete, Greece (fax: 81-393881, e-mail: souzana@math.ucl.ac.uk) or, for the conferences of 2000:

- G. Akrivis, Department of Computer Science, University of Ioannina, Ioannina 45110, Greece (akrivis@cs.uoi.gr);



- J. Ball, Mathematical Institute, Oxford University, 24-29 St Giles, Oxford OX1 3LB, UK (ball@maths.ox.ac.uk);
- G. van der Geer, Faculty of Mathematics, Universiteit van Amsterdam, 1018 WB Amsterdam, The Netherlands (geer@wins.uva.nl);
- G.M. Ziegler, Fachbereich Mathematik, Technische Universität Berlin Strasse des 17 Juni 135, 0623 Berlin, Germany (ziegler@math.tu-berlin.de).

Plenary Lectures will be given by:

- Sir Michael Atiyah (Edinburgh University, UK)
- Mordechai Feingold (MIT, USA)
- Eberhard Knobloch (Technische U. Berlin, Germany)
- Antoni Malet (U. Pompeu Fabra, Barcelona, Spain)
- Pier Daniele Napolitani (U. Pisa, Italy)
- Roshdi Rashed (U. Paris VII, France)
- George Saliba (Columbia U., USA)

## ALHAMBRA 2000

The Alhambra 2000 Joint Mathematical European-Arabic Conference provides an opportunity for a meeting between mathematicians from every European-Arabic culture. The Spanish Royal Mathematical Society offers support, and heads the organisation of this meeting in Granada from 3-7 July 2000. Alhambra 2000 is an acknowledged satellite activity of the 3rd European Congress of Mathematics, Barcelona.

Symposia on current mathematical subjects will be held in parallel sessions on:

- Computational mathematics
- Geometry of submanifolds and related problems
- Non-linear problems
- Orthogonal polynomials
- Public mathematics
- Representation theory of algebras
- Symmetry

Further information is on the web site (<http://www.ugr.es/local/alhambra2000>).

## NUMERICAL ANALYSIS OF RANDOM DYNAMICAL SYSTEMS

### LMS WORKSHOP

Wednesday 15th March 2000

Mathematics Institute, University of Warwick

- Tim Hunt (Cambridge)  
*The triple linkage: a nice example of an Anosov system*
- Luca Dieci (Georgia Institute of Technology)  
*Computation of Lyapunov exponents of linear systems: an overview*
- Andrew Stuart (Warwick)  
*Under-resolved simulations of heat baths*
- Ben Leimkuhler (Leicester)  
*Splitting methods for constant temperature and pressure calculations*
- Sebastian Reich (Surrey)  
*Resonance induced stochastic behaviour in molecular systems*

Organizers: Sebastian Reich and Andrew Stuart. Registration free. Some limited financial assistance may be available to graduate students. For further information please see: <http://www.maths.warwick.ac.uk/miraw> or contact: Elaine Greaves-Coehlo (elaine@maths.warwick.ac.uk).



## 2000 EDINBURGH INTERNATIONAL SCIENCE FESTIVAL

### Maths for the Millennium

This year, the Edinburgh International Science Festival is celebrating Maths Year 2000 with a short series of events looking at numbers in all their guises. The Edinburgh Science Festival is not the same as other science-based events in that it attracts a different type of audience - the public. They come not to learn about science *per se*, but to meet real life scientists and about how science and technology influence their lives.

The maths events in this year's programme range from the infinitesimally small, with a look at the maths gene, to the out-of-this-world calculations that help space speculators decide the best patch of sky to buy. For those who like to do things rather than sit back and listen, there's an assortment of workshops looking at numbers in nature, calculating risks and even how maths is involved in architecture.

#### **The Maths Gene by Professor Keith Devlin**

The message of The Maths Gene is simple but provocative: everyone has it, but most people can't use it! Why?

Monday 17 April, 8 pm, David Hume Tower (Theatre B), George Square.

#### **Celestial Real Estate by Professor Ian Stewart**

Just like buying a house, if you're launching a space probe, some locations in space are considered far more desirable than others. Take a look at the world of celestial real estate, of hypothetical space missions and the ideas that make these missions possible. No equations, no sums - just ideas and examples.

Monday 10 April, 6 pm, Royal Museum, Chambers Street.

#### **Nature and Numbers Workshop**

How do seashells grow? How many fish are there in the sea? Find out how we can use simple mathematics to understand more about the natural world.

8, 10 and 12 April, 3.45 pm, Technopolis, Adam House, Chambers Street.

#### **Take A Chance Workshop**

If you fancy your luck in the Lottery but want to know more about playing the odds, find out what your chances really are at this workshop and discover more about the strange world of probability.

7, 9, 11 and 13 April, 3.45 pm, Technopolis, Adam House, Chambers Street.

#### **Old Bones and New Maths Workshop**

Over 400 years ago, John Napier developed new methods to make maths easier. The technology has changed but Napier's ideas are still used in modern mathematics. Find out about his inventions and make your own set of his famous Bones.

8, 10 and 12 April, 10.30 am, Technopolis, Adam House, Chambers Street.

#### **Royal Mile Maths Trail**

A conducted tour of Edinburgh's Royal Mile, from the Castle to Holyrood Palace, which points out how maths has contributed to the architecture of this unique street.

7, 9, 11 and 13 April, 12.30 pm, meet at Technopolis, Adam House, Chambers Street.

The Science Festival as a whole is a collection of over 150 innovative and extraordinary events designed to introduce science and technology - in the broadest sense - to a non-scientific audience. Each year, the Science Festival attracts an audience of over 160,000 adults, teenagers and children who come to the city to explore, discuss and discover how science and technology influence their lives, through a huge assortment of shows, workshops, talks, exhibitions, activities and tours.

The Edinburgh International Science Festival runs at various venues throughout Edinburgh from 7 - 18 April 2000. To order a copy of the Science Festival Programme, call the Science Festival Hotline on 09067 303001. (Calls charged at £1 per minute to cover p & p. Calls should not last longer than one minute.) Alternatively, check out the website ([www.edinburghfestivals.co.uk](http://www.edinburghfestivals.co.uk)). To book tickets call the Box Office on 0131 473 2070.



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# Mistake

## and How to Find Them before the Teacher Does:

A Calculus Supplement, 3<sup>rd</sup> edition

Barry Cipra

ISBN: 1-56881-122-5

Paperback; \$5.95; £4.00; 80 pp.

An unusual supplement to every calculus textbook, *Mistake and How to Find Them before the Teacher Does* is popular with students and teachers alike. Teachers love the way it encourages students to truly *think* about mathematics rather than simply plugging numbers into equations to crank out answers, and students love the author's straightforward, tongue-in-cheek style.

Calculus teachers will be thrilled to learn that this favorite book is now back in print for the first time in a decade.

Reviews of the previous editions:



"Barry Cipra has written one of the most entertaining pieces I have read in a long while. Whether you are in the process of learning calculus or teaching it, using calculus regularly or revisiting it, you will find this book a sheer delight. You will also find a lot of good advice about how to tell when your calculations have gone wrong."

—Ross L. Finney, coauthor of *Calculus and Analytic Geometry*

"How I wish that something like this had been available when I was a student!"

—Ralph P. Boas, former editor of *The American Mathematical Monthly*



"The title of this light-hearted and amusing book might well have been 'Going Gray in Elementary Calculus and How to Avoid it.' Changing the metaphor, Barry has hit the nail on the finger in hundreds of fine examples."

—Philip J. Davis, coauthor of *The Mathematical Experience*

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## BOOK REVIEW

**Proofs and Confirmations: The Story of the Alternating Sign Matrix Conjecture**, David M. Bressoud, Cambridge University Press, 1999, 274 pp, £17.95, US\$29.95, ISBN 0-521-66646-5.

Not so long ago, the mathematical community celebrated the proof of Fermat's Last Theorem, a conjecture of very long standing. Although its statement is very easily understood, even by a layman, its proof in its entirety would only be accessible to the select few.

This book relates the marvelous story of the proof of another conjecture - the Alternating Sign Matrix (ASM) Conjecture. The statement of this conjecture is also easily understood. However, the real difference is that in this case the eventual proof is within reach of a far larger audience. The conjecture arises from a narrow area of combinatorics; its proof however takes us into some very unexpected directions not only in combinatorics but more widely in mathematics and physics. Furthermore, the characters involved in its proof include some of the most brilliant minds in combinatorics. The unexpected twists and turns will hardly be matched in any novel - this book allows us all to share in the excitement.

In a sense, the story starts with Lewis Carroll or the Reverend Charles Lutwidge Dodgson's late nineteenth century algorithm in terms of ASM's for evaluating determinants. An ASM is a generalisation of a permutation matrix, a square matrix with elements 0,1,-1 where the sum of the entries in each row and column is 1 and the non-zero entries in each row and column alternate in sign. An example is

$$\begin{pmatrix} 0 & 1 & 0 \\ 1 & -1 & 1 \\ 0 & 1 & 0 \end{pmatrix},$$

the only  $3 \times 3$  ASM which is not a permutation matrix. But, there are 429  $5 \times 5$  ASM's in comparison with the 120 permutation matrices. If  $A_n$  denotes the number of  $n \times n$  ASM's, Howard Rumsey and David Robbins looked for a closed formula for  $A_n$ , having calculated the first terms 1, 2, 7, 42, 429, 7436, ..... Ultimately in 1983, by now in collaboration with William Mills, they conjectured (the ASM Conjecture) that

$$A_n = \prod_{j=0}^{n-1} \frac{(3j+1)!}{(n+j)!}.$$

However, having made little progress with its proof, in desperation they contacted Richard Stanley. Within a few days he startled them, not with a proof, but with the revelation that he had seen the same sequence of numbers in slightly earlier work by George Andrews in 1979 in an enumeration problem involving unrelated combinatorial objects, descending plane partitions.

This was only the start with a number of new conjectures arising in turn, some succumbing quickly but never without a great deal of ingenuity. Plane partitions go back over a hundred years to the great British mathematician Major Percy A. MacMahon. He was a master of generating functions, he produced one for plane partitions and conjectured others for special types, in particular, symmetric plane partitions. There were failed attempts at its proof but, having first given a new interpretation in the early seventies, Ian Macdonald proved it in 1979. Andrews however had produced a proof a year earlier using a totally different approach involving hypergeometric series. Macdonald's proof involved symmetric functions and the many other tools of



combinatorics involved in the representation theory of symmetric groups such as Young tableaux and Hall-Littlewood polynomials.

This led in turn to further conjectures for enumerating totally symmetric plane partitions - proved by John Stembridge in 1995 - and one by Macdonald for cylindrically symmetric plane partitions. This was far more of a challenge but was ultimately proved by Mills, Robbins and Rumsey basically in their attempt to understand its relationship with their own ASM Conjecture. Although Andrews had failed to prove Macdonald's conjecture, he had developed powerful techniques which he realised were applicable to other problems and which resulted in his conjectured generating function for descending plane partitions. This is the work which Stanley knew when he responded to the initial approach.

There is no space to relate all that occurred before the ultimate first proof in 1992 by Doron Zeilberger - there are superb fuller expositions in survey articles in the *Mathematics Intelligencer* (1991) and *Notices of the AMS* (1999). But, far more satisfactory is the full story as presented in this stimulating book. There was an additional unique feature to the proof, the direct involvement of 89 referees who each had been allocated a different part of the verification. That however was not the end of the story - a final twist was that the ideas had already materialised in physics - in statistical mechanics. There ASM's had been studied as 'square ice'. It was a mathematical physicist, Gregory Kuperberg, who produced a second proof using techniques of statistical mechanics, in particular on the Yang-Baxter equations for the 6-vertex lattice model. This in turn was developed by Zeilberger to give a new proof of an even more general result.

This may sound like the end of the story - but as the author states, like all good mathematics, it's really just a beginning. A brilliant book.

Alun O. Morris  
Aberystwyth

## TWENTIETH EUROPEAN DYNAMICS DAYS

The 'Twentieth European Dynamics Days' will be held at the University of Surrey, Guildford from Sunday 25 to Thursday 29 June 2000. Topics considered at the conference include:

- Fluid dynamics, turbulence and wave mechanics.
- Pattern formation in physics and mathematical biology.
- Applications in electronic and mechanical engineering.
- Differential equations and iterated mappings.
- Ergodic theory and numerical approximation.

Invited speakers:

- V. Babitsky (Loughborough),
- P. Bressloff (Loughborough),
- T. Bridges (Surrey),
- J. Brindley (Leeds),
- A. Champneys (Bristol),
- M. Dellnitz (Paderborn),
- B. Eckhardt (Marburg),
- M. Hasler (Lausanne),
- P. Holmes (Princeton),
- S. Luzzatto (UMIST),
- R. Murray (Waikato),
- D. Sauzin (Paris),
- A. Scheel (Berlin),
- W. Schiehlen (Stuttgart),
- M. Silber (Northwestern),
- L. Tuckerman (Orsay),
- J. Yorke (Maryland).

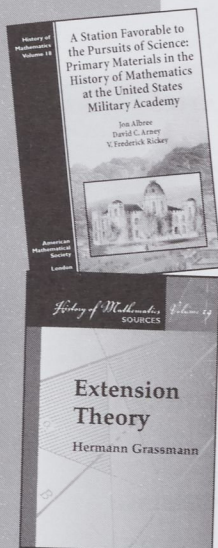
Details, deadlines and on-line registration are available on the web site (<http://www.maths.surrey.ac.uk/announce/DDAYS00/>). The talks commence on Monday morning and run until late Thursday afternoon, with a break on Wednesday afternoon. You can contact the organisers by writing to: 'Dynamics Days 2000', Department of Mathematics and Statistics, University of Surrey, Guildford GU2 5XH, or by e-mail ([dd2000@surrey.ac.uk](mailto:dd2000@surrey.ac.uk)).



# AMERICAN MATHEMATICAL SOCIETY

## History of Mathematics Series

These titles offer interesting historical perspectives on the people, communities, and events that have profoundly influenced the development of mathematics. Beginning with Volume 4, the History of Mathematics series is co-published with the London Mathematical Society. The LMS is registered with the Charity Commissioners.



### A Station Favorable to the Pursuits of Science: Primary Materials in the History of Mathematics at the United States Military Academy

Joe Albree, David C. Arney and V. Frederick Rickey

This book reveals the rich collection of mathematical works located at the nation's first military school, the U.S. Military Academy at West Point. It outlines the relevant history of the Academy, discusses the mathematics department and curriculum, and describes the development of the library during the nineteenth century. A major part of this book is an annotated catalog of the more than 1300 works published between 1496 and 1915 found in the West Point library.

Mathematics and its instruction greatly influenced the development of the Academy, the technological growth of America's army, and the standards of the military profession. These events, in turn, were crucial to the overall development of mathematics, mechanics, and engineering during the nineteenth century in the U.S. Three individuals played a prominent role in this chronicle: S. Thayer, C. Davies, and A. Church.

Listed are rare and historically valuable works in a broad range of mathematical subjects. The collection clearly shows the strong European influence on the early Academy. Also listed are numerous textbooks, in which significant contributions were made by Academy faculty and graduates to algebra, geometry, calculus,

descriptive geometry, mechanics, surveying, and education.

Volume 18; 2000; 272 pages; Hardcover; ISBN 0-8218-2059-1; List \$59; Individual member \$35; Order code HMATH/18LMS

### Extension Theory Hermann Grassmann

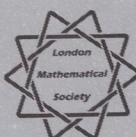
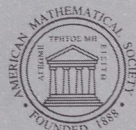
The *Ausdehnungslehre* of 1862 is Grassmann's most mature presentation of his "extension theory". The work captured the full sweep of his mathematical achievements.

Compared to Grassmann's first book, *Lineale Ausdehnungslehre*, this book contains an enormous amount of new material, including a detailed development of the inner product and its relation to the concept of angle, the "theory of functions" from the point of view of extension theory, and Grassmann's contribution to the Pfaff problem. In many ways, this book is the version of Grassmann's system most accessible to contemporary readers.

This translation is based on the material in Grassmann's "Gesammelte Werke", published by B. G. Teubner (Stuttgart and Leipzig, Germany). It includes nearly all the Editorial Notes from that edition, but the "improved" proofs are relocated, and Grassmann's original proofs are restored to their proper places. The original Editorial Notes are augmented by Supplemental Notes, elucidating Grassmann's achievement in modern terms.

This is the third in an informal sequence of works to be included within the History of Mathematics series. Volumes in this subset are classical mathematical works that served as cornerstones for modern mathematical thought.

2000; approximately 403 pages; Softcover; ISBN 0-8218-2031-1; List \$75; Individual member \$45; Order code HMATH-KANNENBERGLMS



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## FORTHCOMING CONFERENCES

### **THIRD MATHEMATICAL EDUCATION OF ENGINEERS**

*Loughborough University 26 – 28 April 2000*

### **MILLENNIUM EVENT IN CONJUNCTION WITH WORLD MATHEMATICS YEAR**

*UCL, London May 2000*

### **COMPUTATIONAL CHALLENGES FOR THE MILLENNIUM**

*Cambridge 13-14 July 2000*

### **NINTH MATHEMATICS OF SURFACES**

*Cambridge 4 – 6 September 2000*

### **THIRD QUANTITATIVE MODELLING IN THE MANAGEMENT OF HEALTH CARE**

*University of Salford, 5 – 7 September 2000*

### **SECOND INTERNATIONAL BOUNDARY INTEGRAL METHODS: THEORY AND APPLICATIONS**

*University of Bath 12 – 16 September 2000*

### **SHORT COURSE AND THIRD IMAGING AND DIGITAL IMAGE PROCESSING: MATHEMATICAL METHODS, ALGORITHMS AND APPLICATIONS**

*De Montfort University, Leicester 12-15 September 2000*

### **SHORT COURSE AND FIRST FRACTAL GEOMETRY: MATHEMATICAL TECHNIQUES, ALGORITHMS AND APPLICATIONS**

*De Montfort University, Leicester 19-22 September 2000*

### **FIFTH MATHEMATICS IN SIGNAL PROCESSING**

*University of Warwick 18 - 20 December 2000*

### **THIRD SPATIAL PATTERNS IN PERMEABLE ROCKS**

*Churchill College, Cambridge 27 - 29 March 2000*

### **FOURTH MODELLING IN INDUSTRIAL MAINTENANCE AND RELIABILITY**

*University of Salford 9-11 April 2001*

### **ADVANCED SIMULATION AND CONTROL FOR AUTOMOTIVE APPLICATIONS**

*Keble College, Oxford 24 - 26 September 2001*

### **FURTHER DETAILS FROM:**

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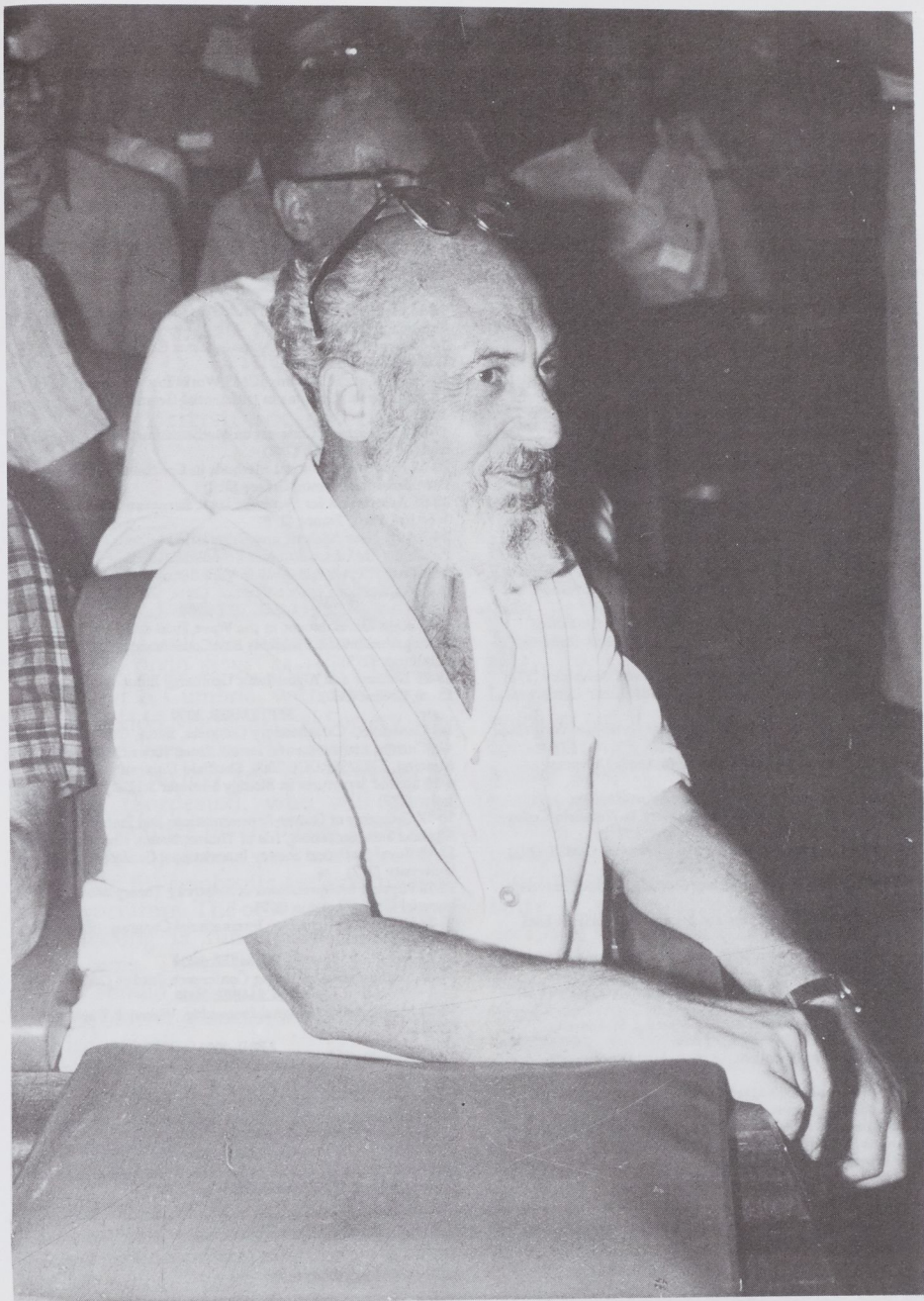
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## DIARY

The diary lists Society meetings and other events publicized 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 in the Society's web site (<http://www.lms.ac.uk/meetings/diary.html>).

### MARCH 2000

- 4 Inaugural Mary Cartwright Lecture, LMS Meeting, Cambridge (279)
- 8 Global Dynamics in Symmetric Systems Workshops, DAMTP, Cambridge (279)
- 10 Edinburgh Mathematical Society Meeting, Dundee University (275)
- 15 Numerical Analysis of Random Dynamical Systems, LMS Workshop, Warwick University (280)
- 20-24 LMS Invited Lectures: The Geometry of Isomonodromic Deformations (B. Dubrovin), Oxford (277) (278)
- 20-24 Stochastic Analysis, LMS/EPSC Short Course, Oxford (276) (277)
- 27-31 Quantum Computing Instructional Course, ICMS Edinburgh (276)
- 27-31 Rigidity in Dynamics and Geometry Euroworkshop, Isaac Newton Institute, Cambridge (279)
- 31-1 Apr Modelling Spatiotemporal Dynamics in Interacting Systems, LMS Meeting, Oxford (276) (278)

### APRIL 2000

- 3 - 7 Workshop on Ergodic Theory of  $Z^d$ -actions, Warwick University (277) (279)
- 5-14 Operator Algebras and Operator Spaces Instructional Conference, ICMS, Edinburgh (276)
- 8-15 Topology, Geometry & Physics Workshop, Warwick University (277)
- 10-14 Algebraic and Co-algebraic Methods in the Mathematics of Program Construction Summer School and Workshop, Oxford (278)
- 10-20 New Theoretical Approaches to Strongly Correlated Systems NATO/EC Summer School, Isaac Newton Institute, Cambridge (276)
- 11-14 Differential Geometry Workshop, Leeds University (274)
- 11-14 Probability and Statistics Research Students' Conference, University of Wales (277)
- 12-15 Mathematical Methods of Regular Dynamics Workshop, Leeds University (279)
- 17-20 British Mathematical Colloquium, Leeds University (274) (279)
- 25-27 Postgraduate Group Theory and Postgraduate Combinatorics Conferences, Queen Mary & Westfield College, London (279)
- 25-29 British Applied Mathematical Colloquium, UMIST (277)

### MAY 2000

- 5 Edinburgh Mathematical Society Meeting, Stirling University (275)
- 19-20 Hilbert's Problems: Past and Future, 2-day BSHM-LMS Meeting, Oxford (278)
- 26-27 Groups in Galway 2000 Conference, National University of Ireland, Galway (279)
- 28-3 Jun Combinatorics 2000 Conference, Gaeta, Italy (278)

### JUNE 2000

- 2 Edinburgh Mathematical Society Meeting, St Andrews University (275)
- 3-7 Association for Symbolic Logic Annual Meeting, Illinois, USA (278)
- 13-16 AMS Scand 2000 Meeting, Odense, Denmark (278)
- 23 LMS Meeting, London
- 24-30 Numerical Methods for Evolution Partial Differential Equations Euroconference, Crete, Greece (280)
- 25-29 Twentieth European Dynamics Days, Surrey University (280)

### JULY 2000

- 3-7 Functional Analysis Meeting, Technical University, Valencia, Spain (265)
- 3-7 Alhambra 2000 Joint Mathematical European-Arabic Conference, Granada, Spain (280)
- 3-14 Approximation, Complex Analysis & Potential Theory Seminar, Montreal University (276)
- 9 - 22 Geometry & Topology Workshop, Warwick University (277)
- 10-14 3rd European Congress of Mathematics, Barcelona, Spain (272) (279)
- 10-14 Free Surface Flows IUTAM Symposium, Birmingham University (272)
- 10-14 Disordered and Complex Systems Conference, King's College, London (278)
- 10-14 Dynamical Systems ICMS Workshop, Edinburgh (279)
- 17-21 Integrable Systems in Differential Geometry, Tokyo, Japan (275)
- 17-22 International Congress on Mathematical Physics, Imperial College, London (257) (278)
- 22-28 New Mathematical Methods in Continuum Mechanics Euroconference, Crete, Greece (280)
- 23-31 Association for Symbolic Logic European Summer Meeting, Paris, France (278)
- 24-2 Aug New Analytic and Geometric Methods in Inverse Problems, EMS Euro Summer School, ICMS Edinburgh (279)
- 29 - 4 Aug Curves and Abelian Varieties over Finite Fields and their Applications Euroconference, Crete, Greece (280)

### AUGUST 2000

- 3-5 Recent Development in the Wave Field and Diffuse Tomographic Inverse Problems EuroConference, ICMS Edinburgh (279)
- 19-25 Discrete and Algorithmic Geometry Euroconference, Crete, Greece (280)

### SEPTEMBER 2000

- 1-4 Constantin Caratheodory Congress, Evros, Greece (279)
- 4-8 Current Environmental Issues: Quantitative Methods Meeting, TIES/SPRUC 2000, Sheffield University (280)
- 4-15 Spatial Structures in Biology Summer School, Taranto, Italy (279)
- 10-17 Geometry of Quiver-Representations and Preprojective Algebras Summer School, Isle of Thorns, Sussex University (275)
- 13-15 Royal Statistical Society International Conference, Reading University (277)
- 15-18 Physical Interpretations of Relativity Theory Meeting, Imperial College London (277)
- 18-23 Differential Geometry International Congress, Bilbao, Spain (275)

### NOVEMBER 2000

- 18-22 Mathematics for Living Conference, Jordan (280)

### DECEMBER 2000

- 18-20 Mathematics in Signal Processing, Warwick University (279)

### APRIL 2001

- 9-12 British Mathematical Colloquium, Glasgow University

### JULY 2001

- 1-6 British Combinatorial Conference, Sussex University (276)
- 9-13 Stochastic Processes and their Applications Conference, Cambridge (275)

### AUGUST 2001

- 12-19 Homological Conjectures for Finite-Dimensional Algebras Summer School, Nordfjordeid, Norway (275)

*The Newsletter is published monthly except in August. Items and advertisements for inclusion in the Newsletter should be sent to the Editor, Susan Oakes, by e-mail, fax or post to the LMS office (addresses below), to arrive before the first day of the month prior to publication.*

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