THE LONDON MATHEMATICAL SOCIETY NEWSLETTER

No. 269 March 1999

FORTHCOMING SOCIETY MEETINGS

Friday-Sunday 14-16 May 1999 - Brussels
Joint meeting with the Belgian Mathematical Society
Friday 18 June 1999 - London
D. McDuff (Hardy Lecture), D Salamon
Friday-Saturday 15-16 October - London
New Applications of Twistor Theory

COUNCIL DIARY
15 January 1999

At the first Council meeting of the year, we welcomed four new members of Council, Norman Biggs, Bill Bruce, Brian Davies and Sarah Rees. This was the first meeting chaired by the new President, Martin Taylor. He had recently returned from a visit to China where he had represented the Society in discussions with the Morningside Center of Mathematics, and had received a very warm reception. He reported that the Chinese mathematical community was keen to strengthen ties with the West; mathematics in China has recently received a huge impetus, with a several-fold increase of funding under way.

Although the President has only just begun his two year term of office, it is already time to find a successor, and Council greeted with acclaim the nomination of David Crighton as President-designate.

We considered again the question of allocation of EPSRC research studentships. A document was tabled, which has also been circulated to all Heads of Departments, outlining the new quota scheme, to come into operation for studentships beginning in October 2000. Concern was expressed about several aspects of the proposal, particularly relating to prospects for small research groups and departments. Representations are being made by the Society to EPSRC, but Council hopes that all Heads of Departments who are worried by these proposals will write to EPSRC to express their concern.

Council unanimously agreed that the enormous contributions made by G.H. Hardy to the Society should be marked by renaming the council room in De Morgan House the 'Hardy Room'. As well as twice being President, Hardy was a pillar of the Society, serving on Council for over 40 years. The sound financial position of the Society today is in no small measure due to Hardy's generous bequest, from which (through interest on investments and royalties from his published works) we continue to benefit.

We discussed the alarming news of the sale, by Keele University, of the Turner collection of rare mathematical books. This had hit the newspapers during the Christmas holidays. Elsewhere in this *Newsletter* readers can learn more about this potential loss to our national mathematical heritage in an article by the Librarian, Norman Biggs.

Finally, Council agreed on two proposals to be put to the membership at the next

General Meeting. One will be to replace the present voting system for Council elections by the Single Transferable Vote method; the other will be to set up a Nominating Committee, which would find candidates for elections. These were described in detail in an article in the *Newsletter* last July, outlining a number of suggestions to make the Society more democratic in structure. As is only appropriate these resolutions were decided by vote, and carried overwhelmingly.

Tony Scholl

THE TURNER COLLECTION OF HISTORICAL MATHEMATICAL BOOKS

Many members of the Society will have seen the press coverage of the sale of the Turner Collection. This remarkable collection of books was given to Keele University by a retired civil servant, Charles Turner, in 1968. It represented a lifetime of collecting, and it contained many interesting and valuable items, including 16 incunabula, and 8 books from the working library of Isaac Newton. Turner gave the collection to Keele because he wanted it to go to a university that had not had the opportunity to acquire a significant holding of such material.

There has been a regrettable lack of public information about the sale. No academic institution or librarian has come forward to say that they were consulted in advance about the future of the collection, despite its obvious significance as part of the national mathematical heritage. Apparently the collection is now in the hands of a book dealer. The only legal constraint on the manner of its disposal is that individual books valued at over £39,600, and manuscripts, may be subject to an objection to their export. Under an EU regulation an export licence is required for the whole collection, but there is apparently no procedure for an objection to be made. Both the British Library and the Royal Society are pressing the government to remedy this omission. It is believed that export licences have been sought for the collection and for about 18 individual items that could be the subject of an objection, but the civil servants responsible cannot reveal which items are involved, or any details about how and when the decision will be made. Expert advice is obtained, but the names of the experts and the nature of their advice is not made public. Only if there is an objection from the experts, and the advisory committee recommends that licences are deferred, and the Secretary of State for Culture, Media and Sport agrees, will the matter be placed in the public domain.

At the meeting on 15 January, the LMS Council agreed that the President should write on its behalf to Chris Smith, the aforesaid Secretary of State for Culture, Media and Sport, deploring the sale and probable dispersal of the collection. Council also felt that it wished to play a constructive part in finding an alternative solution, in the unlikely event of that becoming possible. So the President has informed the Secretary of State that Council has set aside funds to facilitate any solution that would result in the collection remaining intact, in the UK, and available to scholars. This does not mean that the Society is offering to purchase the collection, although if any member has a million pounds or so to spare, I shall be delighted to hear from them.

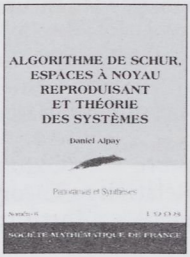
Norman Biggs
Librarian

EPSRC SENIOR FELLOWSHIP

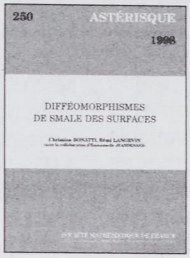
Professor Martin Taylor FRS, President of the Society, has been elected to a five year Senior EPSRC Fellowship. These Fellowships are intended to free their holders from all significant teaching and administrative duties, so that they can devote themselves to research and scholarship. Since the Office of President is not devoid of duties, and since at present he has further onerous duties at the Royal Society, Martin Taylor is deferring taking up his Senior Fellowship until September 1999.

SOCIÉTÉ MATHÉMATIQUE DE FRANCE

PUBLICATIONS



Panoramas et Synthèses
The series Panoramas et Synthèses publishes survey monographs of a high level. The wide spectrum of subjects covered are aimed at mathematicians who are not necessarily specialists.

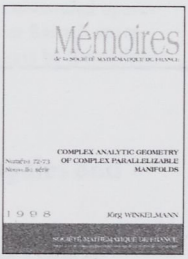


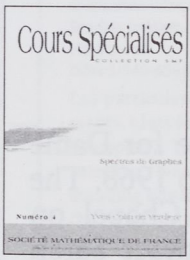
Astérisque
This periodical, created in 1973 on the occasion of the first centenary of the Société Mathématique de France, publishes monographs as well as proceedings of big international conferences and Bourbaki seminars.

The **Revue d'histoire des mathématiques**, publishes original papers in French or in English devoted to the history of mathematics, namely to the full diversity of its practices and issues. Its rubrique "Notes & debates" makes it a forum of critical analysis, of reflection and discussion.

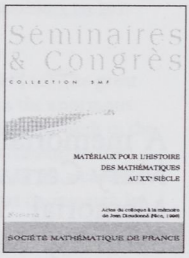
The **Bulletin de la Société Mathématique de France** was founded in 1873. This periodical covers all areas of mathematics by publishing original papers whose results must be proven in full.

Its supplement the **Mémoires de la Société Mathématiques de France**, was created in 1964, is devoted to monographs and series of papers focussing on a given subject.





The series **Cours spécialisés** is aimed principally at students, in particular doctoral students. It publishes courses at the graduate level, written in French or in English.
The series **Séminaires et Congrès** publishes texts chosen for their interest, their quality and their scientific openess.



Our catalogue is available on our url :
http://smf.emath.fr/

For any particular information on the sale ask :

Maison de la SMF, avenue de Luminy, BP 67, F-13274 Marseille cedex 9, France
Tél : 33 4 91 83 30 25 • Fax : 33 4 91 41 17 51 • email : smf@smf.univ-mrs.fr

WORKSHOP ON COMPUTATION IN GROUP THEORY AND GEOMETRY

A Workshop on Computation in Group Theory and Geometry will be held from 9 - 17 July 1999 at the Mathematics Institute, University of Warwick, Coventry. This meeting is being organized by David Epstein and Derek Holt, and is supported by the EPSRC. Limited funds are available for travel and accommodation, though there is heavy competition for them.

Invited speakers (not all yet confirmed) include Gilbert Baumslag, John Cannon, Daryl Cooper, George Havas, Mike Newman, Wilhelm Plesken, Mark Sapir and Bill Thurston. For registration/accommodation forms, etc. please contact: Mrs Peta McAllister, Mathematics Research Centre, University of Warwick, Coventry CV4 7AL (tel: 01203 524403, fax: 01203 523548, e-mail: peta@maths.warwick.ac.uk, web: http://www.maths.warwick.ac.uk/~dbae/symposium99.html).

HISTORY OF MODERN MATHEMATICS

Two talks on the History of Modern Mathematics will be held on Friday 19 March at the Mathematics Institute, University of Warwick:

2:00 David Rowe (University of Mainz, Germany) What Einstein learned from Mathematicians - and not just Marcel Grossmann.

4:00 Roger Penrose (Oxford University) General Relativity Theory since 1960 (Mathematics Institute Colloquium)

For further information contact Jeremy Gray (j.j.gray@open.ac.uk).

ANATOLII P. PRUDNIKOV

Professor Anatolii P. Prudnikov, who was elected a member of the London Mathematical Society on 20 October 1989, died on 10 January 1999.

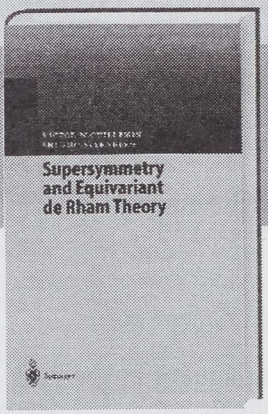
GIRTON COLLEGE

Cambridge

Dame Mary Cartwright Memorial Service

A memorial service will be held at Girton College for Dame Mary Cartwright, Mistress at Girton from 1949 to 1968. The Memorial Service will be held in the College Chapel on Saturday March 13, 1999 at 2.30p.m. Please contact Sarah Pickard, College Secretary, Girton College, Huntingdon Road, Cambridge CB3 0JG (Tel: 01223 338951, Fax: 01223 337021 or E-mail sjp@cam.ac.uk).

Springer for Mathematics



V.W. Guillemin, S. Sternberg

Supersymmetry and Equivariant de Rham Theory

1999. Approx. 260 pp.
Hardcover £ 37.50
ISBN 3-540-64797-X

A textbook of its own, though, presenting the first full treatment of equivariant cohomology in the de Rham setting.

J. Neukirch

Algebraic Number Theory

1999. XV, 565 pp. 16 figs. (Grundlehren der mathematischen Wissenschaften A Series of Comprehensive Studies in Mathematics, Vol. 322)
Hardcover
ISBN 3-540-65399-6

(...) particularly rich in illustrating complements, hints for further study, and concrete examples.... The concluding chapter VII on zeta-functions and L-series is another outstanding advantage of (...) without any doubt, the most up-to-date, systematic, and theoretically comprehensive textbook (...) available."

Z Bl. f. Math.

V. Kozlov, V. Maz'ya

Differential Equations with Operator Coefficients

With Applications to Boundary Value Problems for Partial Differential Equations

1999. XX, 442 pp.
(Springer Monographs in Mathematics)
Hardcover £ 65.00
ISBN 3-540-65119-5

The first systematic and self-contained presentation of a theory of arbitrary order ordinary differential equations with unbounded operator coefficients in a Hilbert or Banach space, developed over the last 10 years by the authors.

D. Revuz, M. Yor

Continuous Martingales and Brownian Motion

3rd ed. 1999. XIII, 602 pp. 8 figs. (Grundlehren der mathematischen Wissenschaften. A Series of Comprehensive Studies in Mathematics, Bd. 293)
Hardcover £ 69.00
ISBN 3-540-64325-7

"This is a magnificent book! (...) The great strength of Revuz and Yor is the enormous variety of calculations carried out both in the main text and also (by implication) in the exercises. ... This is THE book for a capable graduate student starting out on research in probability..."

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NATIONAL UNIVERSITY OF IRELAND, GALWAY

DEPARTMENT OF MATHEMATICS

Junior Lecturerships (2) in Mathematics

Applications are invited for the above full-time permanent posts.

At present the Department runs full degree programmes in the Arts and Science Faculties and is a major contributor to the denominated degree in Computing/Mathematical Science. Service courses in Mathematics are additionally given in the Engineering, Commerce and Medical Faculties. A full degree programme in Financial Mathematics and Economics commenced in September 1998. There are also active and on-going Masters' and PhD programmes.

One vacancy to be filled arises as a result of additional students into the computing area and the other, following the introduction of the new programme in Financial Mathematics and Economics. Preference may be given for one or both posts to applicants with an interest in the interactions between Mathematics and Computer Science and/or in the general area of Analysis.

The Department home page is at http://www.maths.nuigalway.ie

For informal information contact Professor Ted Hurley; tel: +353 91 750442; fax + 353 91 750542; e-mail: Ted.Hurley@nuigalway.ie

The closing date for receipt of applications is **Friday 19th March 1999**.

Further information may be obtained from: Personnel Office, National University of Ireland, Galway, Ireland; tel: +353 91 750360; fax: +353 91 750523; e-mail: Personnel@mis.nuigalway.ie

National University of Ireland, Galway is an equal opportunities employer.

NATIONAL CURRICULUM REVIEW

The National Curriculum is being reviewed and the modifications are intended to take effect from September 2000. The work began late and is being rushed through, and while we anticipate there will be some improvements, we are under no illusions that the new curriculum will be what we would hope for.

A consultation document will be issued shortly. So that as many mathematicians as possible will know what is being planned, we will arrange for a copy of both the old National Curriculum for Mathematics and the Consultation Document to be sent to each university Mathematics Department.

Three members of the Education Committee, Tony Barnard, Tony Gardiner and Chris Robson, have been involved in the review, and have done their best to steer things in the right direction under difficult circumstances. The issues are complex, and it is not always easy for an outsider to see the significance of a proposal. For example, we would all like children to learn how to use and apply mathematics. Unfortunately, to give that as a separate 'attainment target' means that it is often taught and assessed separately — so that children are taught to 'use mathematics' in contexts that don't require them actually to know any.

If you want to know more about any of the proposals or to comment on them, please contact one of the three representatives mentioned above, either directly or via the Education Committee Chairman, Peter Saunders, King's College London (e-mail: peter.saunders@ kcl.ac.uk).

NEWS FROM DE MORGAN HOUSE

Lee-Anne Taylor, our receptionist, has attained the Gold Standard of the Duke of Edinburgh's Award. Her Award Certificate will be presented by the Duke of Edinburgh at St James's Palace on Wednesday 31 March 1999.

CORRESPONDENCE

Dear Madam,

The recent secret sale by an English university of an invaluable national collection of mathematics books raises important general questions which we would all do well to ponder.

Employers increasingly seek to exercise managerial control in a way intended to avoid public discussion of potentially embarrassing or contentious issues. While erstwhile colleagues from a gentler age might not appreciate how much universities have changed, they would rightly be astonished at our failure to recognise that we have a duty to our profession which transcends any duty we may have to our employers.

When a collection, or other national resource, is at risk, even those who no longer believe in "academic freedom" and who accept the imposition of "confidentiality" should feel obliged to alert senior officers of interested national bodies such as the LMS (if necessary "in confidence") so that they can help find a solution which minimises the resulting damage. In the instance referred to above, one suspects that this would not only have led to ways of keeping the materials available to scholars within the UK, but would have alerted the university concerned to the danger of selling at what now looks like a knock-down price!

Yours
Tony Gardiner
School of Mathematics
University of Birmingham

WORLD MATHEMATICAL YEAR 2000 POSTER COMPETITION

As one of the events during the World Mathematical Year 2000, the European Mathematical Society together with local committees in several countries wishes to encourage the idea of posters with a mathematical theme to be displayed in subways, and other public places. These posters

should catch the eye, and be representative of mathematics and its uses. The EMS is convinced that suitable posters will contribute to raising the public awareness of mathematics.

The EMS committee of the WMY 2000 invites mathematicians to submit proposals for posters, in the form of a sketch of the graphics and a suggestion for a short text. There will be prizes for the three best proposals, respectively 200, 150 and 100 ECU, and the name of the proposer will appear on all those posters which are eventually used.

Proposals should be sent before May 1, 1999, to the chairman of the EMS committee for the WMY 2000: Professor Vagn Lundsgaard Hansen, Department of Mathematics, Technical University of Denmark, Building 303, DK-2800 Lyngby, Denmark.

REPRESENTATION OF ALGEBRAS CONFERENCE

An international conference on Representation of Algebras (CRASP) will be held at the University of Sao Paulo from 19 - 24 July 1999. The Scientific Committee consists of: Michael Butler (Liverpool), Flavio U. Coelho (Sao Paulo), Jose Antonio de la Pena (Mexico), Idun Reiten (Trondheim) and Claus Ringel (Bielefeld). The local Organizing Committee comprises of: Flavio U. Coelho, Eduardo N. Marcos, Maria I. R. Martins and Hector A. Merklen. The programme consists of 18 main talks (of 50 minutes each) delivered by invited speakers and contributed short talks (about 20 minutes) on topics related to Representation Theory of Artin Algebras. The following mathematicians have already accepted our invitation for the main lectures:

- M. Barot (UNAM, Mexico)
- R. Bautista (UNAM, Mexico)
- Cibils (Montpellier, France)
- Geiss (UNAM, Mexico)
- Green (Virginia, USA)
- B. Huisgen-Zimmerman (Santa Barbara, USA) to be confirmed
- Krause (Bielefeld, Germany)
- Lenzing (Paderbor, Germany)
- Merklen (Sao Paulo)
- M. I. Platzeck (Bahia Blanca, Argentina)
- Schöorer (Bielefeld, Germany)
- Skowronski (Torun, Poland)
- S. Smalo (Trondheim, Norway)
- Pu Zhang (Beijing, China)

Those wishing to present their work in one of the contributed sessions should submit an abstract by 15 April. The final programme will be arranged on the basis of abstracts provided by participants and it will be available from 15 June on the internet. Registration can be made either by e-mail (crasp@ime.usp.br) or by the webpage (http://www.ime.usp.br/~crasp).

The registration fee for those registering before 15 April is US$80.00 and after that will be US$100.00. Students pay half of these values. The payment can be made on the first day of the conference. The registration fee includes the scientific material to be distributed, coffee breaks, transportations between the hotels and the University and the welcome reception. It is planned to publish the proceedings of the conference consisting of refereed papers submitted by the conference participants.

DEPARTMENTAL NEWS

Nottingham University

Four appointments in pure mathematics, all in arithmetic geometry, have been recently made.

Professor John Cremona (formerly University of Exeter) works in elliptic curves theory and computational number theory;

Professor Michael Spiess (formerly University of Heidelberg) works in higher class field theory, Chow groups, arithmetic dualities, p-adic L-functions;

Dr Katia Consani (formerly MIT) works in degenerations of algebraic varieties, Euler factors of L-functions and recently in Calabi Yau threefolds;

Dr Susan Howson (formerly MIT) works in (noncommutative) Iwasawa theory of elliptic curves without complex multiplication.

THE UNIVERSITY *of York*

Professor of Mathematics

Applications are invited for a Chair of Mathematics to be held from 1 October 1999. The post will include the position of Head of Department for an initial period of five years. The university is looking for a mathematician with a broad view, to lead the department through an imminent period of renewal and expansion. The department at present is well placed to launch a programme of development, having a strong research programme, a thriving graduate school, and a well-qualified and oversubscribed undergraduate entry with steadily rising numbers of applications. It was awarded 22 points out of 24 in the recent QAA Subject Review.

The successful candidate will be a distinguished mathematician in any area of the subject with strong leadership qualities. At York the whole range of mathematics is covered in a single department; there are research groups in algebra, analysis, number theory, optimisation and control, applied analysis, mathematical physics and statistics. In the 1996 RAE it obtained grade 4 in Pure Mathematics and grade 3a in Applied Mathematics. Statistics was entered under Economics and Econometrics, which obtained grade 5.

The salary will be within the professorial range (current minimum £35,170 per annum).

The closing date for applications is **19 March 1999.**

Informal enquiries may be made to the current Head of Department, Professor Tony Sudbery (telephone 01904-433081; e-mail as2@york.ac.uk). Further information and details of application procedures may be obtained from the Personnel Office, University of York, Heslington, York YO10 5DD, quoting reference number 4/1000.

RAMIFICATION THEORY ON ARITHMETIC SCHEMES

A conference on Ramification Theory on Arithmetic Schemes will be held from 11 - 16 April 1999 at CIRM Luminy, France. The organizers are: Boas Erez (Bordeaux) and Ivan Fesenko (Nottingham). The conference is aimed to review progress in ramification theory over the past fifteen years and clarify current trends in the development of ramification theory, with focus on:

- the study of ramification cycles;
- relations between the irregularity of D-modules and the ramification of Galois representations;
- infinite ramification theory and applications.

Key Speakers:

- Ahmed Abbes (Paris)
- John Coates (Cambridge)
- Jean-Marc Fontaine (Paris)
- Roland Huber (Wuppertal)
- Zogham Mebkhout (Paris)
- Kazuya Kato (Tokyo)
- Takeshi Saito (Tokyo)
- Igor Zhukov (St. Petersburg)

Unfortunately, the organizers cannot provide travel or subsistence support. Further information is available from: ram@math.u-bordeaux.fr.

SKEW-PRODUCTS AND SYNCHRONIZATION OF COUPLED SYSTEMS

First Announcement

There will be a two-day workshop at the Department of Mathematics and Statistics, University of Surrey from 12 - 13 July 1999 to examine the theory of Skew-Product systems and applications to synchronization and other effects in coupled dynamical systems. These arise in a variety of areas, including physical, chemical and electrical systems. Invited speakers include:

- Professor Gian-Italo Bischi (Urbino)
- Professor George Sell (Minnesota)
- Professor Rajarshi Roy (Georgia Institute of Technology) (to be confirmed)
- Professor Paul Glendinning (QMW)
- Dr Florian Wagener (Warwick)

The workshop will consist of a mix of talks aimed at postgraduate level as well as more general research lectures. There will be time available for informal discussions and a number of slots for contributed talks over the two days. If you are interested in further information or would like to contribute a talk, please send details along with a title and brief abstract to the organizers, John Terry (map1jt@mcs.surrey.ac.uk) or Peter Ashwin (P.Ashwin@surrey.ac.uk). Overnight accommodation on campus can be provided; the workshop is partially supported from the LMS Scheme 3 'Skew products' joint research group and the Centre for Interdisciplinary Nonlinear Mathematics at the University of Surrey. The latest information is available on the web (http://www.mcs.surrey.ac.uk/Personal /J.Terry/sync.html).

BCTCS 15

The 15th British Colloquium for Theoretical Computer Science (BCTCS 15) will take place at Keele University from 14th to 16th April 1999. The invited speakers will be Dr Wan Fokkink (Swansea), Dr Martin Hofmann (Edinburgh), Professor Bill McColl (Oxford), Dr Ian Pratt (Manchester), Dr David Pym (QMW, London), Professor Glynn Winskel (Aarhus, Denmark), and Professor Mike Worboys (Keele). The colloquium welcomes anyone with an interest in theoretical and mathematical topics related to computer science. Contributions are sought on any aspect of theoretical computer science, including concurrency, types, semantics, formal methods, computational complexity, algorithms, discrete mathematics, proof theory and logic, artificial intelligence, automated reasoning, and

symbolic computation. Authors of contributed papers will have the option to submit them after the meeting for publication in a special issue of the Journal of Universal Computer Science.

Some financial assistance is available to postgraduate students for attending the meeting. Further details, including abstracts and registration forms, can be found on the web at http://www.keele.ac.uk/depts/cs/Announcements/bctcs/ or by contacting John Stell (john@cs.keele.ac.uk). BCTCS 15 is supported by a grant from the LMS and also by EPSRC.

VISIT OF PROFESSOR VLADIMIR EIDERMAN

Professor Vladimir Eiderman from Moscow State Civil Engineering University will visit the UK from 26 April to 10 May 1999, under the auspices of the London Mathematical Society's fSU Visitor Scheme. He will give the following talks: 28 April at 2.30 pm at University College, London, on "Hausdorff measures and capacities", 30 April at 2.00 pm at Imperial College, London, on "Estimates of subharmonic functions outside exceptional sets", and 5 May at 2.00 pm at Cambridge University on "Decrease of analytic functions on a sequence of points and uniqueness theorems". Further information can be obtained from the Mathematics Department, University College, London WC1E 6BT (tel: 0171 504-2844 or by e-mail: ros@math.ucl.ac.uk).

DAME MARY CARTWRIGHT FRS

A memorial service for Dame Mary Cartwright FRS will be held in the chapel of Girton College, Cambridge, at 2.30 pm on Saturday, March 13, 1999, and this will be followed by tea. All are welcome. Dame Mary joined the London Mathematical Society in 1928. She served as President of the Society from 1961 to 1963, and was awarded the De Morgan Medal in 1968.

MAFELAP 1999

The tenth conference on the Mathematics of Finite Elements and Applications (MAFELAP) will be held at Brunel University fom 22 - 25 June 1999 and will be focused on the following themes:

- Theory and practice in finite elements
- Finite volume methods
- Engineering and scientific applications of FEM
- Boundary element methods
- Adaptivity
- Singularities
- Parallel and vector processing
- CFD and structural mechanics
- Flow in porous media
- Financial mathematics

The 1999 Zienkiewicz Lecture will be given by Roland Glowinski (University of Houston), and the invited speakers are:

- Ulrich Langer (Linz University)
- Roland Lewis (University of Wales, Swansea)
- J Tinsley Oden (University of Texas at Austin)
- Roger Owen (University of Wales, Swansea)
- Rolf Rannacher (University of Heidelberg)
- Christof Schwab (Technical University of Darmstadt)
- Endre Suli (University of Oxford)
- Mary Wheeler (University of Texas at Austin)
- John Whiteman (Brunel University)
- Peter Wriggers (Technical University of Hannover)
- Luiz Wrobel (Brunel University)

The programme will also include mini-symposia, lectures in parallel sessions and poster papers. More information is available from either the web site (http://www.brunel.ac.uk/~icsrbicm/maflap99) or the e-mail address (mafelap@brunel.ac.uk) or by writing to: The Secretary, MAFELAP 1999, BICOM, Brunel University, Uxbridge UB8 3PH.

25% off LMS books to LMS members

A Primer of Infinitesimal Analysis

John L. Bell

This book provides an approach to the calculus and its applications to physical problems using a concept of the infinitesimal. This is the first elementary book to employ the so-called 'zero-square' infinitesimals.

£19.95 HB 0 521 62401 0 136pp 1998

Multiplicities and Chern Classes in Local Algebra

Paul C. Roberts

In recent years there have been several new proofs in the field of commutative algebra. This book describes the mathematical background necessary to prove these results and sets them in their algebraic context.

£37.50 HB 0 521 47316 0 304pp 1998

Cambridge Tracts in Mathematics, 133

Holomorphic Spaces

Sheldon Axler, John E. McCarthy and Donald Sarason

This volume contains expository articles describing the role Hardy spaces, Bergman spaces, Dirichlet spaces, and Hankel and Toeplitz operators play in modern analysis.

£35.00 HB 0 521 63193 9 486pp 1998

Mathematical Sciences Research Institute Publications, 33

Cohen-Macaulay Rings

Second edition

New edition in paperback

Winfried Bruns and H. Jürgen Herzog

This book meets the need for a thorough, self-contained introduction to the homological and combinatorial aspects of the theory of Cohen-Macaulay rings, Gorenstein rings, local cohomology, and canonical modules.

£24.95 PB 0 521 56674 6 468pp 1998

Cambridge Studies in Advanced Mathematics, 39

Cambridge books are available from good bookshops, alternatively phone UK +44 (0)1223 325588 to order direct using your credit card, or fax UK +44 (0)1223 325152. For further information, please email Giulia Williams on science@cup.cam.ac.uk or browse our Worldwide Web server http://www.cup.cam.ac.uk

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Jean Pierre Bourguignon, P

Featuring contributions r covers the most recent a partial differential equa

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Geometry and Coh

Peter H. Kropholler, Graham

This volume reflects the i contains articles on coho group theory.

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London Mathematical Society

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Volume 2: Cohomology o

D. J. Benson

These two volumes are a f modern development in algebras. Much of the

Volume 1: £18.95 P

Volume 2: £18.95 P

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Cake-Cutting Algorithms Jack Robertson and William Webb, A.K. Peters, 1998, pp 181, ISBN 1-5 6881-076-8, US$38, £26.
Fair Division Steven J. Brams and Alan D. Taylor, Cambridge University Press, 1996, reprinted 1998, pp 272, ISBN 0-521-556 44-9, £14.95.

How do you divide a cake fairly? Of course, the answer depends on the definition of 'fair': any reasonable definition of fairness must take account of the fact that different people see things differently. In other words, my assessment of the value of a piece of cake may not be the same as yours.

Suppose we define 'fair' to mean that if there are n people, then each person gets at least 1/n of the cake according to that person's measure of value. When there are only two people, a simple 'cut and choose' method works: Alice cuts the cake into two halves, according to her measure, and Bob chooses one that is at least half according to his measure. In the 1940s Steinhaus, Banach, and Knaster devised a generalisation of this method, which works when there are n people. Their algorithm requires $O(n^2)$ cuts, so it is good in the sense of complexity theory, although not much use for dividing a wedding cake. The existence of an O(n) algorithm is still open, the best known result being O(n log n).

This simple question leads to a number of fascinating problems, ranging from philosophical arguments about fairness and justice, through issues of politics and economics, to very specific mathematical problems. One of the most important insights was mentioned by Steinhaus in his original paper: if everyone has a different measure of value, then everyone can get strictly more than 1/n according to that measure of value. A simple algorithm for achieving this 'strongly fair' division, if we are given a piece about which there is known to be disagreement, is due to Douglas Woodall (1986). Woodall's algorithm is finite, but we cannot estimate the number of cuts needed in advance.

Another variant, which has been studied intensively in recent years, introduces the concept of envy. It may be true that, although I get a piece that is at least 1/n, someone may get a piece that is bigger than mine, according to my measure. A division that avoids this situation is said to be 'envy-free'. When n = 3 there is an algorithm for envy-free division that uses only 5 cuts, but for larger values of n no corresponding bound is known as yet. Brams and Taylor (1995) have found an algorithm that will terminate, but we cannot say when.

The book by Robertson and Webb is an excellent introduction to this field. It is clearly written and would be suitable as a text for an undergraduate course. Brams and Taylor cover much of the same ground in a more discursive fashion, and they discuss applications to many practical problems. They also cover the related topics of auctions and elections, both of which are the subject of intense interest at this time. Their book would be ideal for a course designed to broaden the horizons of undergraduate mathematicians. Both books contain material that could be easily incorporated into courses on the algorithms or games.

Norman Biggs
London School of Economics

Graph connections: relationships between Graph Theory and other areas of Mathematics (ed. Lowell W. Beineke and Robin J. Wilson), Clarendon Press, Oxford, 1997, ISBN 0-19-851497-2. Price £35.00 hbk.

The origin of this book was a one-day conference held at the Open University in Milton Keynes in 1994. Several chapters are based on talks given there but to extend the scope of the work some additional chapters have been added. The conference was designed primarily for postgraduate students to learn about "graph theory across the field of mathematics".

Generally speaking the chapters are independent of one another but, in order to give the book coherence, uniform notation

and terminology is generally used throughout and this, together with other background material, is provided in an introductory chapter by Robin Wilson. Each of the remaining sixteen chapters deals with a single area of mathematics: Enumeration (Ronald C. Read), Number theory (Roger Cook), Partial orders (Graham Brightwell), First-order logic (Peter J. Cameron), Linear algebra (Peter Rowlinson), Matroids (James Oxley), Codes (Robert T. Curtis & Tony R. Morris), Groups (Peter J. Cameron), Geometry (Edward R. Scheinerman), Topology (Lowell W. Beineke), Knots (Dominic Welsh), Probability (Colin McDiarmid), Statistics (Peter Wild), Computing (Robin Whitty), Artificial neural networks (Martin Anthony) and International finance (Norman Biggs). Most of the book is concerned with finite graphs but the chapter on First-order logic is an exception.

Sometimes the relationships are two-way between graph theory and the other area; sometimes they are not. For example, the Matroids chapter, dealing mainly with connectivity, provides examples of how the interplay between the two subjects has led to new results for both graphs and matroids. The chapter on codes, however, uses adjacency matrices of graphs to generate binary codes, so the new results are in coding theory; in particular all binary self-dual doubly-even codes of length not exceeding 24 are explicitly constructed. By contrast the Partial orders chapter defines various graphs and digraphs associated with a partial order and then explores how the partial ordering properties are reflected in the graphs.

The Probability chapter looks at "random graphs" and "typical" properties of a graph, as well as random functions defined on graphs. A connected graph G might have a random length defined on the edges which is uniformly distributed on [0, 1] and independently distributed on each edge. One result here considers such a length for the complete graph K_n and states that as $n \to \infty$, the expected value of the minimum total length of a spanning tree in K_n tends to $\zeta(3)$. This is an intriguing result even to those of us much more interested in those highly non-typical graphs, comparatively few in number, which have many symmetries. Such graphs tend to have special eigenvalues and these are considered not only in the Linear algebra chapter but also in the Statistics chapter (which looks at the close connection between statistical designs and graph theory).

Many of the topics in the book are ones which long-standing graph-theorists would expect to be included, but the final chapter considers a more unexpected topic: International finance. Directed graphs are introduced the edges of which are labelled with exchange rates and the matrix-tree technique is applied to show that the balance of payments determines a unique system of exchange rates. As this review was being written euro exchange rates were being fixed, but probably not by using graph theory and it remains to be seen whether such theory will prove of lasting value in finance.

Like many areas of mathematics, graph theory is now a vast subject with an absurdly large number of published papers. Volumes summarising some of the more important results are, therefore, essential especially for those researching in other fields who wish to learn how graph theory has been or might be used in their own ares. The choice of topics covers a broad range and the book is a useful addition to the literature.

E. Keith Lloyd
University of Southampton

TITCHMARSH CENTENARY MEETING

A meeting to mark the centenary of the birth of E.C. Titchmarsh will be held in the Mathematical Institute, 24-29 St Giles', Oxford OX1 3LB, on Tuesday 1 June 1999, 2.30 - 5.40 pm. The speakers will be D.A. Edwards (Oxford), W.N. Everitt (Birmingham), D.R. Heath-Brown (Oxford) and R.J. Wilson (Open). Professor N.J. Hitchin will chair the meeting. Further particulars will be announced in due course. Enquiries should be sent to Dr D.A. Edwards at the above address or by e-mail (edwardsd@maths.ox.ac.uk).

ISAAC NEWTON INSTITUTE FOR MATHEMATICAL SCIENCES
EC Summer School
Connecting Fundamental Physics and Cosmology

Organisers: T Banks, V A Rubakov, P J Steinhardt and N G Turok

16 - 27 August 1999

Programme Theme Throughout this century, physicists have recognized the profound relationship between fundamental physics and cosmology. Understanding events in the first instants after the big bang requires knowledge of the nature's elementary constituents and their interactions. In recent years, as particle/string theory has pushed the frontier to energy scales beyond the reach of accelerators, cosmology has emerged as one of the most effective ways of probing theoretical proposals. In the last few years, however, this connection has been less in evidence. Cosmologists have been focusing on the impending breakthroughs in observations, including high resolution measurements of the cosmic microwave background anistropy, three dimensional surveys of the galaxy distribution, and observations of the mass distribution via gravitational lensing. String theorists have been focusing on new developments in string theory, M-theory, and its application to black holes. During this period new discoveries and puzzles have emerged in both subfields which hint at possible connections.

This programme is a combination of School and Workshop designed to explore new research areas at the cosmology/fundamental physics interface. The first week will be a School in which leaders in cosmology and fundamental physics will give pedagogical reviews focusing on the key unsolved problems that may benefit from cross-interaction. Talks by particle/string theorists, will include fundamentals of string theory, M-theory, Horava-Witten cosmology, large and small dimensions, moduli and other light fields, and the cosmological constant. Talks by cosmologists will highlight outstanding problems regarding inflationary cosmology, dark matter, missing energy, baryogenesis, ultra-high energy cosmic rays, and cosmic defects, along with a prospectus on forthcoming developments in observation.

The second week will be a Workshop of more specialized talks with extensive time for small-group interaction and informal discussion with the aim of initiating new research and collaborations. Applicants should contact the organizers if they wish to make a presentation at the Workshop.

Speakers for School Tom Banks, Keith Dienes, Savas Dimopoulos, Michael Duff, Alan Guth*, T Kibble, Juan Maldacena, Burt Ovrut, Lisa Randall*, Valery Rubakov, David Spergel*, Paul Steinhardt, Leonard Susskind, Michael Turner*, Neil Turok, Gabriele Veneziano, Alex Vilenkin (*tentative)

This Summer School is supported by the European Community and funding is available to support some young researchers. This is intended for nationals of EC Member States and of Iceland, Lichtenstein, Norway and Israel, who must all be under 35 years of age. Limited funds exist for other participants. Self-supporting participants of any age and nationality are welcome to apply.

Location and Costs The workshop will take place at the Newton Institute and accommodation for participants will be provided at Wolfson Court, adjacent to the Institute. The conference package costs £300, which includes registration fees, accommodation, breakfast and evening meals plus lunch and refreshments during the days that the workshop takes place.

Further information and application forms are available from the WWW at http://www.newton.cam.ac.uk/programs/sfu.html where information about the main programme can be found. Completed application forms should be sent to Heather Hughes at the above address, or via e-mail to h.hughes@newton.cam.ac.uk

Closing date for the receipt of applications is 30 April 1999

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 1999 the series Euroconferences in Mathematics on Crete, sponsored by the Training and Mobility of Researchers Programme of the Commission of the European Union, with the following conferences.

Dynamics of Patterns 19 - 25 June 1999
Organizers: N. Alikakos (Athens, Greece), J. Ockendon (Oxford, UK) G. Papanicolaou (Stanford, USA). Main speakers: G. Fusco (L'Aquila, Italy), W. Jaeger (Heidelberg, Germany), J. Ockendon (Oxford, UK), E. Presutti (Roma II, Italy), M. Soner (Princeton, USA), M. Struwe (Zurich, Switzerland).

Holomorphic Dynamics 26 June - 2 July 1999
Organizers: K. Athanassopoulos (Crete, Greece), S. Bullett (London, UK), A. Douady (Paris-Sud, France), B. Harvey (London, UK). Main speakers: K. Astala (Jyvaskyla, Finland), B. Branner (Lyngby, Denmark), A. Douady (Paris-Sud, France), J. Hubbard (Cornell University, USA), M.Lyubich (Stony Brook, USA).

Computer Vision and Speech Recognition: Statistical Foundations and Applications 3 - 9 July 1999
Organisers: B. Gidas (Brown University, USA), D. Mumford (Brown University, USA). Main speakers: Y. Amit (Chicago, USA), O. Catoni (Paris VI, France), P. Diakonis (Stanford, USA), O. Faugeras (INRIA Sophia Antipolis, France), D. Geman (Ecole Polytechnique, Palaiseau, France), S. Geman (Brown University, USA), I. Johnstone (Stanford, USA), C. Regazzoni (Genoa, Italy), S. Ullmann (Weizman Institute, Israel), J. Zerubia (INRIA Sophia Antipolis, France).

Groups of Tree Automorphisms and Lattices 24 - 30 July 1999
Organisers: H. Bass (Columbia University, USA), A. Lubotzky (Hebrew University, Israel), S. Mozes (Hebrew University, Israel), M. Picardello (Roma II, Italy). Main speakers: H. Bass (Columbia University, USA), M. Burger (Zurich, Switzerland), P. de la Harpe (Geneva, Switzerland), A. Lubotzky (Hebrew University, Israel), S. Mozes (Hebrew University, Israel), F. Paulin (Paris-Sud, France).

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 the mountain 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 is estimated at about 30 ECU in a double room or 38 ECU in a single room. The registration fee amounts to 250 ECU.

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 conference series will continue in summer 2000 with the following conferences: Numerical methods for evolution partial differential equations (M. Crouzeix, Rennes, France), Curves and Abelian varieties over finite fields and their applications (G. van der Geer, Amsterdam, Netherlands), New mathematical methods in continuum mechanics (J. Ball, Oxford, UK), Discrete and algorithmic geometry (G. Ziegler, Berlin, Germany).

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. Thomee (Goeteborg, Sweden), A. Wilkie (Oxford, UK).

For additional information please contact the local co-ordinator: Susanna Papadopoulou, Department of Mathem atics, University of Crete, Heraklion, Crete, Greece (fax: 81-393881, e-mail: souzana@math.uch.gr) or, for the conferences of 1999: N. Alikakos, Mathematics Department, University of Athens, Panepistimiopolis, 15784 Zografou, Athens, Greece (e-mail: nalikako@cc.uoa.gr), S. Bullett, School of Mathematical Sciences, Queen Mary & Westfield College, University of London, Mile End Road, London E1 4NS, UK (e-mail: s.r.bullett@qmw.ac.uk), B. Gidas, Division of Applied Mathematics, Brown University, Providence, RI 02912, USA (e-mail: gidas@dam.brown.edu), S. Mozes, Department of Mathematics, Hebrew University of Jerusalem, Givat Ram, 91904 Jerusalem, Israel (e-mail: mozes@math.huji.ac.il).

ESGI 34

The 34th European Study Group with Industry (ESGI 34) will take place at the University of Edinburgh, from 6th to 9th April 1999. This meeting will, as usual, bring academics and industrialists together to look at problems of mutual interest. The meeting starts with problem presentations by the industrialists. These are followed by intensive workshop discussions. The meeting concludes with presentations, by the academics, of the progress made on the problems. A training course of lectures applicable to industrial problems is planned for the meeting. Anyone interested should contact Professor Andrew Lacey, Department of Mathematics, Heriot-Watt University, Riccarton, Edinburgh EH14 4AS; tel: 0131-451 3228; e-mail: A.A.Lacey@ma.hw.ac.uk; or see http://www.ma.hw.ac.uk/~andrewl/ESGI/SG34A.html.

INTERFACES IN MATHEMATICS

A two-day meeting to coincide with Sir Michael Atiyah's 70th birthday will take place on Wednesday 21st and Thursday 22nd April 1999 at The Royal Society, Carlton House Terrace, London SW1Y 5AG. The speakers are: E. Witten, I.M. Singer, D. Zagier, J.-M. Bismut, I.G. Macdonald, N.S. Manton, S.K. Donaldson and P.B. Kronheimer. All interested are welcome. The meeting is supported by the London Mathematical Society and the Society has also made provision for funds to help graduate students attend the meeting. Those wishing to come to the meeting, or apply for graduate student support, should inform The Administrator, Mathematical Institute, 24-29 St Giles, Oxford OX1 3LB (drake@maths.ox.ac.uk). There will be a £25 registration fee (to include a light buffet lunch) payable on entry. Further details may be found on http://www. maths.ox.ac.uk/mfa70.

BMC SCIENTIFIC COMMITTEE

The scientific committee of the BMC will meet in the course of the next BMC in Southampton. The committee will consider future sites of the BMC, from 2003 onwards. If anyone wishes to make a proposal, please contact the Chairman of the Committee, H.G. Dales at Leeds (e-mail: pmt6hgd@leeds.ac.uk).

GROUPS IN GALWAY

A conference will take place from Friday 21st to Saturday 22nd May at the Department of Mathematics, National University of Ireland, Galway. Among the invited speakers are Professor E. Khukhro (Novosibirsk/Cardiff) and Dr S. Linton (St Andrews). For further information please contact the organisers who are Dane Flannery (e-mail: Dane. Flannery@nuigalway.ie) and James Ward (e-mail: James.Ward@nuigalway.ie) at the Department of Mathematics, NUI, Galway, Ireland (tel: +353 91-750442, fax: +353 91-750542).

ICMS WORKSHOPS DURING MAY 1999

Model Theory of Henselian Valued Fields (16 - 22 May)

Organisers: Deirdre Haskell (College of the Holy Cross, Worcester. Massachusetts)
Dugald Macpherson (Department of Pure Mathematics, University of Leeds)

The meeting will focus on those areas in the model theory of valued fields in which there have been important recent developments. It is expected that there will be about two scheduled lectures per day, together with informal talks for smaller groups. The aim of the workshop is to encourage discussion and collaboration among the participants. The following themes will be discussed in the main lectures, with the emphasis on new topics and open problems.

Quantifier-elimination and rigid subanalytic geometry.
Motivic integration.
Application of minimality to VC-dimension.
Imaginaries in valued fields.
Valuations, derivations, automorphisms.

Hamiltonian Mechanics and Small Divisors in PDEs (23 May - 4 June)

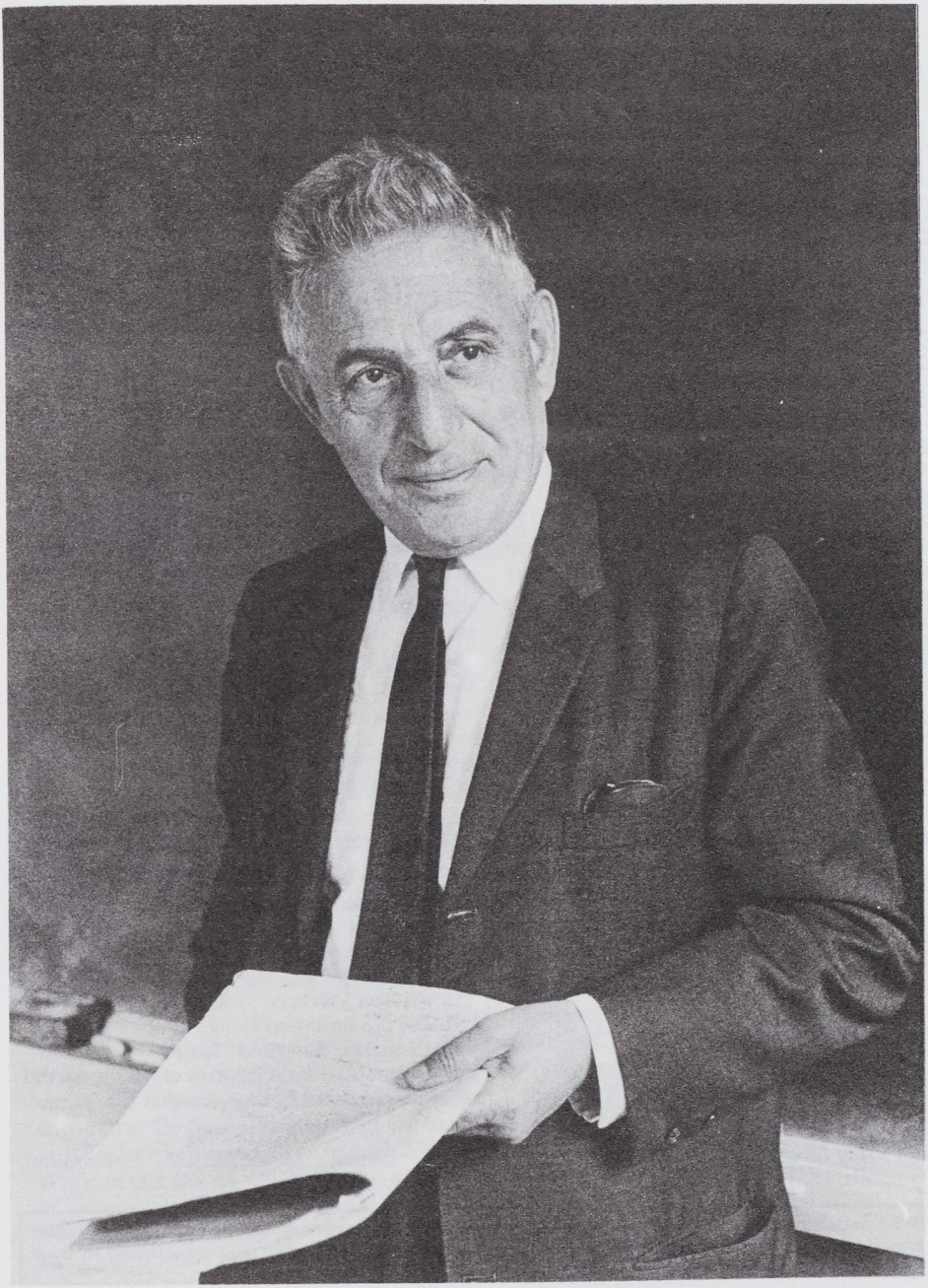
Organisers: Walter Craig (Brown University), Jack Carr (Heriot-Watt University), Konstantin Khanin (Heriot-Watt University), Sergey Kuksin (Heriot-Watt University), Eugene Wayne (Boston University)

This workshop aims to bring together for a two-week meeting a number of the leading experts in Hamiltonian systems. The workshop will concentrate on analytical techniques for Hamiltonian mechanics and dynamical systems, and their applications to Hamiltonian PDEs. Topics to be discussed include

KAM theory for PDEs
Infinite dimensional Birkhoff normal forms
Invariant Gibbs measures for PDEs and Poincare recurrence
Gromov's symplectic capacity in infinite dimensional phase space
Nekhoroshev's theory of metastability of quasi-periodic orbits

There are likely to be a number of colloquium lectures associated with this meeting. They will be advertised later.

Both meetings will be held at 14 India Street, Edinburgh EH3 6EZ. Further information on the Workshops is available on the ICMS web pages (http://www.ma.hw.ac.uk/icms/1999/ index.html). Places on the workshops are limited and anyone interested in attending should contact the organisers or Tracey Dart at ICMS (tracey@maths.ed.ac.uk; tel 0131 220 1777).



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DIARY

The diary lists Society meetings and other events publicized in the Newsletter. For further information, refer to the figure in brackets, which is a cross reference to the LMS Newsletter number.

MARCH 1999

5 Geometric Measure Theory, Spitalfields Day, Isaac Newton Institute, Cambridge (267)
8 North British Functional Analysis Seminar, University of Newcastle (267)
12 Edinburgh Mathematical Society Meeting, Abertay (263)
22-25 Single Cells to Continua Workshop, ICMS Edinburgh (267)
22-25 Probability and Statistics Research Students' Conference, Bristol University (268)
29 - 1 Apr British Mathematical Colloquium, Southampton University (265)

APRIL 1999

6-8 British Topology Meeting, University of Wales Swansea (267)
6-9 LMS Invited Lectures - Professor A. Mielke, University of Bath (262)
6-10 Homological Algebra, EPSRC-LMS Short Course (266)
6-15 Analysis on Lie Groups and Partial Differential Equations ICMS Instructional Conference, Edinburgh (265)
12-15 British Applied Mathematics Colloquium 1999, Bath University (266)
14 - 15 Combinatorics and Communications Applications, EPSRC/LMS MathFit Workshop, Royal Holloway University (268)
29 Non-Secret Encryption and Public Key Cryptography Lecture, University College, London (268)

MAY 1999

7 Edinburgh Mathematical Society Meeting, Stirling (263)
14-16 Belgian Mathematical Society and London Mathematical Society Joint Meeting, Université de Bruxelles (260)(261)(268)

JUNE 1999

4 Edinburgh Mathematical Society Meeting, Aberdeen (263)
18 LMS Meeting, Hardy Lecture, London
28 - 2 July Nonlinear Partial Differential Equations Conference, Besançon, France (268)
29 - 9 July Stochastic Analysis LMS Durham Symposia, Durham University (268)

JULY 1999

5-9 International Congress of Industrial and Applied Mathematics (ICIAM 99), Edinburgh University (252)
5 - 9 Quadratic Forms and Their Applications Conference, University College, Dublin (268)
12-16 British Combinatorial Conference, Kent University (254)(268)
12-16 American Mathematical Society and Australian Mathematical Society Joint Meeting, University of Melbourne (260)
12-16 System Modelling and Optimization Conference, IFIP TC7, Cambridge (267)
19 - 29 Quantum Groups LMS Durham Symposia, Durham University (268)
25 - 7 Aug Banach Algebras International Conference, Pomona College, California (268)
26 – 6 Aug Integrable Systems Seminar, University of Montreal (267)
26 - 6 Aug Structure Formation in the Universe, Isaac Newton Institute, Cambridge (268)

AUGUST 1999

22-29 Hall Algebras Summer School, Hesselberg, Germany (263)

OCTOBER 1999

15-16 Two-day LMS Meeting, New Applications of Twistor Theory, London

NOVEMBER 1999

19 LMS Meeting - Annual General Meeting

APRIL 2000

17-20 British Mathematical Colloquium, Leeds University

JULY 2000

3-7 Functional Analysis Meeting, Technical University, Valencia, Spain (265)
10 - 14 3rd European Congress of Mathematics, Barcelona, Spain
17-22 International Congress of Mathematical Physics, Imperial College, London (257)

APRIL 2001

9-12 British Mathematical Colloquium, Glasgow University

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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