

# THE LONDON MATHEMATICAL SOCIETY NEWSLETTER

No. 284

July 2000

## FORTHCOMING SOCIETY MEETINGS

*Friday 20 October 2000 - London*

G.W. Gibbons, S.W. Hawking

*Friday 24 November 2000 - London*

Annual General Meeting

Presidential Address

## COUNCIL DIARY

12 May 2000

Council began with a period of silence as a mark of respect to the late David Crighton, member of Council and President-designate. His tragic death is a loss for the entire mathematical community. An unwelcome but essential task was to choose a new candidate for president, and Council received with unanimous approval the suggestion from Nominating Committee that Trevor Stuart be proposed for the presidency.

We have noted in the past that there are too many bodies speaking on behalf of mathematics for a coherent message to be heard. Over the last two years there have been discussions on how to create a formal body which can speak with one voice on behalf of all of mathematics. Progress has now been made in establishing a Council for the Mathematical Sciences. This is a formalisation of the group of Presidents of IMA, LMS and RSS (which has already been in existence for some

time), and the involvement of JMC, HoDoMS and the OR Society is also expected.

The President has been invited to visit St Petersburg and Moscow, and we spent some time discussing ways in which the Society could assist the mathematical communities of the fSU and Eastern Europe. A starting point has been the fSU scheme run by Programme Committee, which was established several years ago, at the advent of perestroika. However conditions for academics in the fSU are now even worse than they were then.

This short meeting concluded with an announcement that John Erdos was leaving the Society's Library Committee. He has given ten years of service to the Society, on Council and as Librarian. We thanked him warmly for his generous contributions over the years.

Tony Scholl

## LYNDON M. WOODWARD

Dr Lyndon M. Woodward, who was elected a member of the London Mathematical Society on 19 November 1970, died on 12 June, aged 55.

## ORDER OF MERIT

Sir Roger Penrose FRS has been awarded the Order of Merit. Amongst the current holders is Sir Michael Atiyah. Membership of the order is limited 24 people at any one time.

## LMS PRIZES 2000

### **Polya Prize**

PROFESSOR T.J. LYONS of Oxford is awarded the Polya Prize for his fundamental contributions to analysis and probability, ranging from those of a purely geometric character to applications in financial mathematics. Terry Lyons has made fundamental contributions to the potential theory of Riemannian manifolds. He has also made important contributions to the theory of reversible processes associated with self-adjoint Dirichlet forms, showing (jointly with Zheng, then later with Zheng, Zhang and Stoica) that the process is the sum of a martingale and a martingale in reversed time. An outstanding contribution has been his profound new calculus of differential equations driven by rough signals. The full implications of this theory will take time to evaluate, but it is clear that they will be profound.

### **Senior Berwick Prize**

PROFESSOR J.F. TOLAND FRS of Bath University is awarded the Senior Berwick Prize for the paper 'The index change and global bifurcation for flows with a first integral', Proc. London Math. Soc. (3), 66 (1993) 539-567 written jointly with E.N. Dancer. This paper completes a series of four papers defining and investigating a new degree function for a class of ordinary differential equations with a first integral. It is a homotopy invariant for certain dynamical systems and leads to new global continuation results for fixed-period solutions of parametrised families of Hamiltonian systems. John Toland has established himself as a leading contributor to the rigorous theory of steady water waves and has transformed previously non-rigorous aspects of hydrodynamics into strict mathematical analysis. Toland has the gift of letting a problem lead him to the appropriate mathematics. This is not an effortless or facile process; it means first finding and mastering existing machinery that is relevant, and then adding to it whatever is demanded by the

problem in hand.

### **Naylor Prize**

PROFESSOR A.S. FOKAS of Imperial College, London is awarded the Naylor Prize for 2000. He has made substantial contributions to several aspects of integrable systems. One main theme of Thanasis Fokas' work has been that of integrable systems of partial differential equations, and the role of inverse scattering and other methods for solving such equations. With collaborators, he was in the vanguard with the introduction of the concepts of master symmetry and of bi-Hamiltonian structures, and in the development of the Riemann-Hilbert and so-called  $\bar{d}$ -bar methods for solving partial differential equations. In further joint work, Fokas showed how the famous inverse scattering approach could be exploited to solve other linear and nonlinear problems with nontrivial boundary and initial conditions. This pioneering work is expected to have major ramifications for elucidating the behaviour of partial differential equations.

### **Whitehead Prizes**

DR M.A.J. CHAPLAIN of Dundee University is awarded a Whitehead Prize for his research in the mathematical modelling of the various stages of tumour growth and cancer invasion. Mark Chaplain has recently helped to develop hybrid deterministic-discrete-stochastic models to study tumour metastasis, the process by which tumour cells break off the main tumour mass, and tumour-induced angiogenesis, the process by which a tumour develops its own blood supply. His research has resulted in the development of a three-dimensional model of angiogenesis and he and colleagues are presently incorporating blood flow into this model, which will enable him to make predictions on how best to target tumours via blood-borne drugs.

DR G.M. STALLARD of the Open University is awarded a Whitehead Prize for her fundamental contributions to complex dynamics. Her work is of very high quality in an area that is intensely competitive internationally: it is characterised by a mastery of hard analytic technique together with a first class grounding in classical analysis. A major part of Gwyneth Stallard's work concerns the Hausdorff dimension of Julia sets  $J(f)$  of transcendental entire and meromorphic functions  $f$ . Her results on the range of possible values of  $J(f)$  are a real *tour de force*: not only does she show that every value  $d$  in the interval  $(1,2]$  may be realised as the Hausdorff dimension of some transcendental entire function, but she also provides the first explicit determination of any non-integral Hausdorff dimension of a Julia set. Her work shows that she has the insight to select the right examples for study, the originality to adapt and invent new techniques, and the ability to carry out calculations of great complexity.

PROFESSOR A.M. STUART of the University of Warwick is awarded a Whitehead Prize for his contributions to numerical analysis and its links with non-linear dynamics. Andrew Stuart is one of the leading numerical analysts of his generation worldwide. In his 1996 book with A.R. Humphries, *Dynamical Systems and Numerical Analysis*, and in subsequent work, he has defined the standards for investigating how the properties of dynamical systems relate to those of numerical discretizations. Aside from his technical contributions, one of Stuart's striking features has been his strong appreciation and knowledge of allied areas of pure mathematics, which has helped to raise the standards and expectations of those who interact with him.

PROFESSOR B.J. TOTARO of Cambridge University is awarded a Whitehead Prize for his striking contributions to algebraic geometry and related subjects. Totaro's work is notable for its originality and

breadth, ranging from modular representation theory to algebraic topology. Many of his results bear on the algebraic subvarieties of a projective variety and the Chow rings that these define. He has introduced novel ideas leading in many cases to deep results on long-standing questions, such as the Hodge problem and the definition of characteristic numbers of singular varieties.

## ANNUAL ELECTIONS TO COUNCIL

The normal way in which nominations to Council are now made is via the Nominating Committee, but there is still provision for any member of the Society to make nominations directly. Anyone who wishes to propose someone for a position as an Officer of the Society or as a member of Council is invited to inform J.H. Coates, who is currently chairing the Nominating Committee ([j.h.coates@dpmms.cam.ac.uk](mailto:j.h.coates@dpmms.cam.ac.uk)) or one of the other members of the Committee (J.M. Ball, A.R. Camina, T.A. Gillespie, A.C. McBride, M.A.H. MacCallum, A.J. Macintyre and C.M. Series). Any direct nominations should be sent to the Council and General Secretary (John Pym, Department of Pure Mathematics, The University, Sheffield S3 7RH; [j.pym@sheffield.ac.uk](mailto:j.pym@sheffield.ac.uk)) to arrive before noon on 1 September 2000; such nominations must bear the signatures of the Nominator and three Seconders (if the By-Laws are changed at the General Meeting on 23 June; otherwise one Secunder only will be required) and of the Nominee.

## A. CYRIL OFFORD

Professor A. Cyril Offord, FRS, FRSE, who was elected a member of the London Mathematical Society on 11 December 1930, *Proceedings* Editor 1949-52, served on Council 1949-53, died on 4 June, aged 93.

## LMS 2000 HONORARY MEMBER

Freeman J. Dyson has been elected as an Honorary Member of the London Mathematical Society in recognition of his distinguished and pioneering work on the application of mathematics to the physical sciences, including quantum theory. Dyson's style as mathematician and physicist was formed by his mentors Besicovitch in Cambridge and Davenport in London. Following work in mathematics, including the theory of partitions and number theory during the early 1940's in England, Dyson moved to the United States and moved into theoretical and mathematical physics. His earliest work there was a substantial calculation of the Lamb shift of energy levels between states of the hydrogen atom.

In the late 1940's, the radiation theories in quantum electrodynamics of Tomonaga and Schwinger on the one hand, and of Feynman on the other, had appeared so different as to be incompati-

ble. Dyson showed that they were in fact mathematically equivalent. He followed this with papers on the S-matrix of Heisenberg and on the renormalization method in quantum electrodynamics, work of immense significance.

In the 1960's and 1970's, Dyson became interested in the statistical theory of the energy levels of complex systems. He generalized the concept of a random matrix, an entity that may be regarded as a novel statistical-mechanical ensemble.

Freeman Dyson, who has been a distinguished member of the London Mathematical Society for nearly 60 years, is a Fellow of the Royal Society and of the United States Academy of Sciences. He has been awarded prizes by the Royal Society, the Royal Netherlands Academy of Sciences and the German Physical Society, and has recently received the prestigious Templeton Prize.

## FELLOWS OF THE ROYAL SOCIETY

Amongst those elected to Fellowship of the Royal Society in May 2000 were: Robert Sinclair MacKay, Professor of Mathematics, University of Warwick and Paul Kingsley Townsend, Professor of Applied Mathematics and Theoretical Physics, University of Cambridge. Grigory Isaakovich Barneblatt, Professor in Residence, Department of Mathematics, University of California at Berkeley, USA was elected a Foreign Member.

## AUSTRALIA DAY HONOURS

In the 2000 Australia Day Honours, Professor Joseph Mark Gani, a member of the London Mathematical Society was awarded Membership in the General Division of the Order of Australia, for services to mathematics.

## ISSAC 2000

The 2000 International Symposium on Symbolic and Algebraic Computation (ISSAC) will take place at St Andrews University from 7-9 August 2000, preceded by a day of workshops on 6 August. ISSAC is an annual conference for researchers in, and users of, all forms of algebraic and symbolic computation. The conference is supported by the London Mathematical Society, the Edinburgh Mathematical Society, Texas Instruments, NAG Ltd and Waterloo Maple Incorporated. Some support is available for British postgraduate students wishing to attend. Two related meetings are taking place the same week: Calculemus 2000, which explores links between computer algebra and automated theorem proving, and the 13th OpenMath workshop. Full details and on-line registration forms can be found on the web (<http://www-gap.dcs.st-and.ac.uk/issac2000>).

# LONDON MATHEMATICAL SOCIETY

## Spitalfields Day

Thursday 12 October 2000

Isaac Newton Institute for Mathematical Sciences  
Seminar Room 1, 20 Clarkson Road, Cambridge

### IN SEARCH OF THE IDEAL KNOT

**Organiser:** Renzo L Ricca (UCL)

**Programme Theme:**

Six world specialists will present results and latest discoveries on mathematical and physical knots. From soliton knots to electromagnetic knots, from elastic knots to chemical and biological knots, we shall follow our experts in a fascinating search for the ideal knot.

09.30 - 10.00	Coffee & Registration
10.00 - 11.00	<b>Dr Andrzej Stasiak</b> (Lausanne) <i>Ideal knots and physical knots</i>
11.00 - 12.00	<b>Professor Antti Niemi</b> (Uppsala) <i>Field theory realizations of knots and links</i>
12.00 - 13.00	<b>Professor Art Winfree</b> (Arizona) <i>Knotted phase singularities in motionless media</i>
13.00 - 14.00	Lunch at the Institute
14.00 - 15.00	<b>Professor Antonio Fernandez-Ranada</b> (Complutense) <i>Electromagnetic knots</i>
15.00 - 16.00	<b>Professor John Maddocks</b> (EPFL) <i>Global curvature, thickness, ideal shapes and self-contact</i>
16.00 - 16.30	Tea
16.30 - 17.30	<b>Professor De Witt Sumners</b> (Florida State) <i>Knots in DNA</i>
17.30 - 18.00	Wine Reception

These lectures are linked to the Isaac Newton Institute Programme on  
*Geometry and Topology of Fluid Flows*

Anyone interested is welcome to attend. Lunch will be provided at a nominal charge; please let Tracey Andrew at the Institute know by **22 September 2000** if you intend to come, to help us plan for lunch: tel: (01223) 335984; fax: (01223) 330508; e-mail: t.andrew@newton.cam.ac.uk. There are limited funds available to assist research students to attend: please apply by **22 September 2000** to Tracey Andrew at the Institute. Scientific enquiries may be addressed to Dr Renzo L Ricca, Isaac Newton Institute, 20 Clarkson Road, Cambridge CB3 0EH (e-mail: r.ricca@newton.cam.ac.uk).

## SEVEN PROBLEMS

In order to celebrate mathematics in the new millennium, The Clay Mathematics Institute of Cambridge, Massachusetts (CMI) has named seven "Millennium Prize Problems." The Scientific Advisory Board of CMI selected these problems, focusing on important classic questions that have resisted solution over the years. The Board of Directors of CMI designated a \$7 million prize fund for the solution to these problems, with \$1 million allocated to each. During the Millennium meeting held on 24 May 2000 at the Collège de France, Timothy Gowers presented a lecture entitled "The Importance of Mathematics," aimed for the general public, while John Tate and Michael Atiyah spoke on the problems. The CMI invited specialists to formulate each problem.

One hundred years earlier, on 8 August 1900, David Hilbert delivered his famous lecture about open mathematical problems at the second International Congress of Mathematicians in Paris. This influenced the decision to announce the millennium problems as the central theme of the Paris meeting.

The rules that follow for the award of the prize have the endorsement of the CMI Scientific Advisory Board (Alain Connes, Arthur Jaffe, Andrew Wiles and Edward Witten) and the approval of the Directors. The members of these boards have the responsibility to preserve the nature, the integrity, and the spirit of this prize.

The seven problems are:

- \* P versus NP
- \* The Hodge Conjecture
- \* The Poincaré Conjecture
- \* The Riemann Hypothesis
- \* Yang-Mills Existence and Mass Gap
- \* Navier-Stokes Existence and Smoothness
- \* The Birch and Swinnerton-Dyer Conjecture

Further details can be found on the Clay Mathematics Institute web site (<http://www.claymath.org>).

## RAE 2001 GUIDELINES

The LMS Women in Mathematics Committee would like to draw the attention of the mathematics community to a new feature of the RAE 2001 guidelines. The position of members of staff who have had a break from research during the current RAE period, for example because of maternity leave, is now explicitly mentioned in the main guidelines and in the subject-specific guidelines. The main guidelines now state that:

"The situation of staff who have taken maternity leave or other career breaks, who hold part-time contracts, who are disabled, or who have been absent for long periods through illness (where this is indicated by HEIs) will be taken into account in reaching overall judgements of quality where it is indicated in submissions."

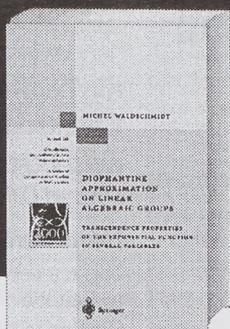
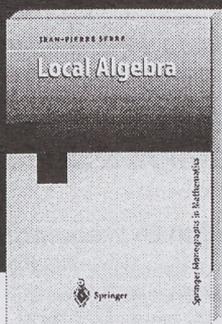
Thus if you employ staff who have taken maternity leave or any other career break during the current RAE period, or if you are considering employing such a person, this may be indicated on the RAE returns and will be taken into account by the RAE panels in reaching their judgements.

C.A. Hobbs  
Chair of the LMS Women in  
Mathematics Committee

## HONORARY DEGREE

Professor Jean-Pierre Serre, Honorary Member of the London Mathematical Society, will be receiving an Honorary Doctorate from the University of Durham on 7 July 2000. He will be giving a lecture in the Department of Mathematical Sciences, University of Durham, at 4 pm on the same day. For more information contact: Professor A.J. Scholl ([a.j.scholl@durham.ac.uk](mailto:a.j.scholl@durham.ac.uk)).

# Hot off the press



**J.-P. Serre**

## Local Algebra

This is an English translation of the now classic "Algèbre Locale - Multiplicités". It gives a short account of the main theorems of commutative algebra, with emphasis on modules, homological methods and intersection multiplicities ("Tor-formula"). Many modifications to the original French text have been made by the author for this English edition: They make the text easier to read, without changing its intended informal character".

2000. XIII, 129 pp. (Springer Monographs in Mathematics) Hardcover  
\* DM 79,-; FF 298,-; £ 27,-; Lit. 87.250  
ISBN 3-540-66641-9

**F. Lemmermeyer**

## Reciprocity Laws

### From Euler to Eisenstein

2000. XIX, 487 pp.  
(Springer Monographs in Mathematics) Hardcover  
\* DM 129,-; FF 486,-; £ 44,50;  
Lit. 142.460 ISBN 3-540-66957-4

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\* Recommended retail prices. Prices and other details are subject to change without notice. In EU countries the local VAT is effective. -dtp- 06/00/INT/ST

**M. Waldschmidt**

## Diophantine Approximation on Linear Algebraic Groups

### Transcendence Properties of the Exponential Function in Several Variables

This book deals with values of the usual exponential function  $e^z$ ; a central open problem is the conjecture on algebraic independence of logarithms of algebraic numbers. It includes proofs of the main basic results, an introduction to height functions and Lehmer's problem, several proofs of Baker's theorem as well as explicit measures of linear independence of logarithms.

2000. XXVII, 633 pp. (Grundlehren der mathematischen Wissenschaften, Vol. 326) Hardcover  
\* DM 169,-; FF 637,-; £ 58,50;  
Lit. 186.640 ISBN 3-540-66785-7

**Z. Mei**

## Numerical Bifurcation Analysis for Reaction-Diffusion Equations

2000. XIV, 414 pp. (Springer Series in Computational Mathematics, Vol. 28)  
Hardcover \* DM 159,-; FF 599,-; £ 55,-;  
Lit. 175.600 ISBN 3-540-67296-6

**R. Liptser, A.N. Shiryayev**  
**Statistics of Random Processes I**  
**General Theory**

2nd rev. and exp. ed. 2000. XII, 421 pp. (Applications of Mathematics, Vol. 5) Hardcover  
\* DM 129,-; FF 486,-; £ 44,50;  
Lit. 142.460 ISBN 3-540-63929-2

**R. Liptser, A.N. Shiryayev**  
**Statistics of Random Processes II**  
**Applications**

2nd, rev. and exp. ed. 2000. X, 402 pp. (Applications of Mathematics, Vol. 6) Hardcover  
\* DM 129,-; FF 486,-; £ 44,50;  
Lit. 142.460 ISBN 3-540-63928-4

**T.A. Springer, F.D. Veldkamp**  
**Octonions, Jordan Algebras, and Exceptional Groups**

2000. VIII, 208 pp. (Springer Monographs in Mathematics) Hardcover  
\* DM 139,-; FF 524,-; £ 48,-;  
Lit. 153.520 ISBN 3-540-66337-1

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# London Mathematical Society Monographs

## New books for 2000

OXFORD  
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### Introduction to Local Spectral Theory

*Kjeld Laursen and Michael Neumann*

An exposition and synthesis of the spectral theory of bounded linear operators. There are many new results, including exciting work of Albrecht and Eschmeier, and substantial new applications.

**London Mathematical Society Monographs No. 20**  
0-19-852381-5 Hardback £75.00 £52.50  
591 pp February 2000

### Characters of Finite Coxeter Groups and Iwahori-Hecke Algebras

*Meinolf Geck and Götz Pfeiffer*

This is the first book which systematically develops the subjects of conjugacy classes and irreducible characters, both from a theoretical and an algorithmic point of view. All types of finite Coxeter groups are covered, as are classical results and more recent developments.

**London Mathematical Society Monographs No. 21**  
0-19-850250-8 Hardback £65.00 £45.50  
304 pp June 2000

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### Classical Harmonic Analysis and Locally Compact Groups

*Second Edition*

*Hans Reiter and Jan D. Stegeman*

This is a new edition of the classic 1968 work by Reiter on harmonic analysis on locally compact groups. It has been carefully revised and brought up to date by Jan Stegeman; much new work is included. The volume centres on the work of Beurling, Wiener, Carleman, and Weil, and expounds the relations between classical analysis and group theory.

**London Mathematical Society Monographs No. 22**  
0-19-851189-2 Hardback £60.00 £42.00  
320 pp July 2000

### Operator Spaces

*Edward Effros and Zhong-jin Ruan*

This book, written by two leading experts, is an exposition of an exciting new area in functional analysis, that of "quantized Banach spaces". It lays down the foundations of the subject, using basic ideas of functional analysis, and then develops many new results. It will interest researchers in operator theory, mathematical physics, and quantum computation.

**London Mathematical Society Monographs No. 23**  
0-19-853482-5 Hardback £60.00 £42.00  
368 pp June 2000

### Banach Algebras and Automatic Continuity

*H. G. Dales*

A substantial new account of the algebraic and analytic theory of Banach algebras, and of their homomorphisms and derivations; many examples are considered.

**London Mathematical Society Monographs No. 24**  
0-19-850013-0 Hardback £65.00 £45.50  
July 2000

## LONDON MATHEMATICAL SOCIETY BOOK SERIES REPORTS

### Lecture Note Series

Since last year's report 11 proposals have been approved by Cambridge University Press, 5 have been rejected by the Editor and 5 are awaiting referees' reports, modification or a decision by CUP.

The volumes actually published in 1999 are:

- 255 Clarkson/Nijhoff - Symmetries & Integrability
- 256 Voelklein et al - Aspects of Galois Theory
- 257 Madore - Noncommutative Differential Geometry, 2 edn
- 258 Cooper/Truss - Sets and Proofs
- 259 Cooper/Truss - Models & Computability
- 260 Campbell et al - Groups St Andrews 1
- 261 Campbell et al - Groups St Andrews 2
- 263 Bruce/Mond - Singularity Theory
- 264 Hulek et al - Trends in Algebraic Geometry
- 265 Blake/Seroussi/Smart - Elliptic Curves in Cryptography
- 267 Lamb/Preece - Surveys in Combinatorics, 99
- 268 Dimassi/Sjostrand - Asymptotics in the Classical Limit
- 273 Davies/Safarov - Spectral Theory and Geometry.

Those currently in production are:

- 269 Bekka/Mayer - Ergodic Theory and Group Actions
- 271 Alberverio/Kurasov - Singular Perturbations of Differential Operators
- 272 Peterfalvi - Character Theory for the Odd Order Theorem
- 274 Tan Lei - The Mandelbrot Set - Theme and Variations
- 275 Howie - Computational Geometric Aspects of Modern Algebra
- 276 Casas-Alvero - Singularities of Plane Curves
- 277 Kechris - Dynamical Systems and Descriptive Set Theory.

One notable aspect is the acceptance of Applied Mathematics proposals by Cholewa/Dlotko and Ogden/Fu. In the past there have been various titles on the Pure/Applied borderline, but it seems appropriate to open our doors a bit more widely, provided that there is a serious interface between the two disciplines.

Of those titles accepted in 1999, a number of multi-author compilations have been altered to make them more acceptable to our general readership, with an emphasis to include more survey material.

For the new millennium, there is a new board of Editorial Advisers: Stephen Donkin (QMW), Ivan Fesenko (Nottingham), John Roe (Penn State) and Endre Süli (Oxford).

Nigel Hitchin  
Oxford

### Student Texts

The LMS Student Texts Series now contains almost 50 volumes. Established in 1983, it complements the LMS Lecture Notes Series by publishing textbooks of an expository nature aimed at advanced undergraduates and beginning graduate students. The series aims to offer introductions to areas in which there is an absence of well-established and standardised exposition, providing students with access to new and exciting ideas as they emerge.

Ideally, a Student Text should be accessible to a first year research student reading alone. Texts are frequently based on graduate courses given by the authors; translations of successful books at the right level are also considered. Printing is usually done from camera ready copy or Tex files produced by the author, providing a rapid and relatively informal and low cost mode of publication. Volumes appear in hardback and paperback and should be between 150 and 400 pages in length.

In the general spirit of greater interaction between pure and applied mathematics both the LMS and CUP have hoped for some time to expand the series in the applied direction. To further this aim, we are pleased that John Gibbon (Imperial) has agreed to become the Applied Series Advisor, and we are now looking forward to the arrival of the first suitable manuscripts. We are also hoping to extend in the direction of publishing more lecture notes from Instructional Conferences. On the model of the very successful notes of Carter-Macdonald-Segal on Lie groups and Lie algebras, such collections will have to form a coherent whole, be well thought out and edited, and will probably have no more than 3-4 authors.

The terms of the editorial team came to an end with the close of the century and a new team has been appointed with effect from January 2000. Besides John Gibbon, we are pleased that Martin Liebeck (Imperial) and Peter Olver (Minnesota) will be joining Van Strien, Elmer Rees and myself.

Manuscripts or proposals for consideration are always welcome and should be sent either to one of the editors or to R. Astley at Cambridge University Press (rastley@cup.cam.ac.uk), any of whom will also be happy to answer enquiries about the series.

Caroline Series  
Warwick

### Monographs

The LMS Monographs are published for the Society by Oxford University Press, and they are edited by H.G. Dales (Leeds) and P.M. Neumann (Oxford); the advisers are J.H. Coates, E.B. Davies, S.K. Donaldson, J.F. Toland and W.S. Kendall. We are very pleased to report that Brian Davies will become an Editor of the Series from 1 January 2002.

The aim of this Series is to publish authoritative accounts of current research in mathematics, and high-quality expository works bringing the reader to the frontiers of research. They are designed to

be accessible to graduate students.

The volumes are produced in an attractive hard-back style, and are published under the imprint of "Clarendon Press, Oxford". We are pleased to say that it has now been agreed that LMS members can purchase individual copies at the increased discount rate of 30%.

Recently we have published "An Introduction to Local Spectral Theory" by Kjeld B. Laursen and Michael M. Neumann (volume 20). This is a very fine and careful exposition of an important topic, and includes many new results.

Four further volumes are with the publishers, and will appear soon in 2000. These are:

- \* Characters of Finite Coxeter Groups and Iwahori-Hecke Algebras by M. Geck and G. Pfeiffer (volume 21);
- \* Classical Harmonic Analysis and Locally Compact Groups by H. Reiter and J.D. Stegeman (volume 22);
- \* Operator Spaces by E.G. Effros and Z.-J. Ruan (volume 23);
- \* Banach Algebras and Automatic Continuity by H.G. Dales (volume 24).

Several more volumes are in preparation, and will appear in the coming years. However, the editors are always happy to receive proposals or suggestions about possible future Monographs. Please note that we are pleased to have informal discussions, and to give advice and assistance, at an early stage of the development of a Monograph; we are aware that the writing of a Monograph is a substantial task, and we stand ready to give considerable assistance.

Please contact H.G. Dales (pmt6hgd@leeds.ac.uk) or Elizabeth Johnston of OUP (johnstoe@oup.co.uk) for further information.

Garth Dales  
Leeds

### AMS/LMS History of Mathematics Series

The following books have been published this year:

- \* *Pioneers of Representation Theory: Frobenius, Burnside, Schur, and Brauer* by Charles W. Curtis (volume 15).
- \* *A Station Favorable to the Pursuits of Science: Primary Materials in the History of Mathematics at the United States Military Academy* by Joe Albree, David C. Arney and V. Frederick Rickey (volume 18).

In addition, a new subseries called *History of Mathematics Sources* has been initiated with

- \* *P.G.L. Dirichlet, Lectures in Number Theory, with Supplements* by R. Dedekind, translated by John Stillwell (volume 16)
- \* *Jacques Hadamard, Non-Euclidean Geometry in the Theory of Automorphic Functions*, edited by J.J. Gray and Abe Schenitzer (volume 17).

Items in this subseries will consist of translations of important works, or collections of articles on specially interesting topics, and will appear in paperback which will reduce their price. They will be included and numbered with the main series, and we hope that they may be of special use and interest to graduates and undergraduates. In fact, things of this sort have already appeared, for example *Sources of Hyperbolic Geometry*, collected, translated, and annotated by John Stillwell (1996, volume 10), which contains translations of and commentaries on articles by Beltrami, Klein, and Poincaré. However, the new style of production will now distinguish them from the other historical commentaries.

Several further titles are in the process of production, at all stages from negotiation and copy editing through to printing. Those who have or know of projects or manuscripts that may be suitable for publication in the series are encouraged to get in contact with a member of the editorial board: David Fowler (chair), Jeremy Gray and Thomas Körner.

David Fowler  
Warwick

## SYMMETRY AND PERTURBATION THEORY

The third workshop on Symmetry and Perturbation Theory (SPT2001) will take place in Cala Gonone, Sardinia, from 6 - 13 May 2001. The workshop is open to everyone but audience will be limited in number, and full information is available on the web (<http://web.tiscalinet.it/SPT2001/spt.html>).

## MATHS QUIZ 2000 17 October 2000

Every mathematician in the world is invited to take part in a unique mathematical contest in which competitors will answer as many challenging mathematical questions as possible. It is called Maths Quiz 2000, and it is a contribution of the Centre de Recerca Matemàtica, Barcelona (CRM Barcelona) to the celebrations of World Mathematical Year. We are talking about a question-and-answer global and live competition. All the competitors (individuals or small teams) will compete in real time through the Internet. The contest will start at 12 o'clock (midday) Greenwich Mean Time on 17 October and will last exactly 24 hours, without interruption.

Beyond the thrill of the challenge, the winners will be rewarded with two sorts of prizes. The five highest scoring competitors will each receive workstations courtesy of SUN Microsystems, the main sponsor of the competition. On the other hand, to spur on all the players, even those far behind the leaders, we will be giving away throughout the competition a considerable number of book tokens valued at 100 Euros which have been offered by Birkhäuser Verlag to be used in the purchase of books from this publisher. So mark 17 October in your diaries, find a small group of colleagues, and visit the site of Maths Quiz 2000 (<http://www.mq2000.org>).

Mari Julia  
Secretary CRM

## 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 Classic**

### Lectures on Number Theory

P. G. L. Dirichlet with supplements by R. Dedekind

*A new edition of Dirichlet's Lectures on Number Theory would be big news any day, but it's particularly gratifying to see the book appear as "the first of an informal sequence" which is to include "classical mathematical works that served as cornerstones for modern mathematical thought." So all power to the American Mathematical Society and the London Mathematical Society in their joint-venture History of Mathematics series: may the "Sources" subseries live long and prosper. [T]his is quite accessible, and could almost be used as a textbook still today. For those who like to heed Abel's admonition to "read the masters, not their students," here's a great opportunity to learn more about Number Theory.*

—MAA Online

This volume is a translation of Dirichlet's *Vorlesungen über Zahlentheorie* which includes nine supplements by Dedekind and an introduction by John Stillwell, who translated the volume.

*Lectures on Number Theory* is the first of its kind on the subject matter. It covers most of the topics that are standard in a modern first course on number theory, but also includes Dirichlet's famous results on class numbers and primes in arithmetic progressions.

The legendary story is told how Dirichlet kept a copy of Gauss's *Disquisitiones Arithmeticae* with him at all times and how Dirichlet strove to clarify and simplify Gauss's results. Dedekind's footnotes document what material Dirichlet took from Gauss, allowing insight into how Dirichlet transformed the ideas into essentially modern form.

This important book combines historical perspective with transcendent mathematical insight. The material is still fresh and presented in a very readable fashion.

This book is the first in an informal sequence of works to be included within the History of Mathematics series. Volumes to be published within this subset are classical mathematical works that served as cornerstones for modern mathematical thought. (For another historical translation by Professor Stillwell, see *Sources of Hyperbolic Geometry*, Volume 10 in the History of Mathematics series.)

Volume 16; 1999; 275 pages; Softcover; ISBN 0-8218-2017-6; List \$49; All AMS members \$39; Order code HMATH/16LMS

**Supplementary Reading**

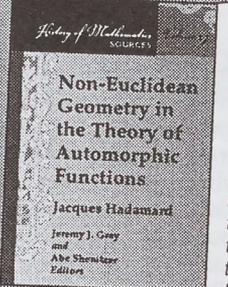
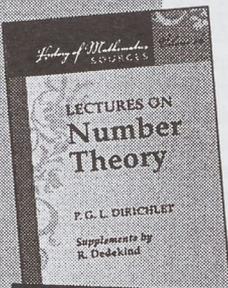
### Non-Euclidean Geometry in the Theory of Automorphic Functions

Jacques Hadamard, and Editors, Jeremy J. Gray and Abe Shenitzer

This is the English translation of a volume originally published only in Russian and now out of print. The book was written by Jacques Hadamard on the work of Poincaré.

Poincaré's creation of a theory of automorphic functions in the early 1880s was one of the most significant mathematical achievements of the nineteenth century. It directly inspired the uniformization theorem, led to a class of functions adequate to solve all linear ordinary differential equations, and focused attention on a large new class of discrete groups. It was the first significant application of non-Euclidean geometry. The implications of these discoveries continue to be important to this day in numerous different areas of mathematics.

Volume 17; 1999; 95 pages; Softcover; ISBN 0-8218-2030-3; List \$19; All AMS members \$15; Order code HMATH/17LMS



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**UNIVERSITY OF WARWICK  
MATHEMATICS INSTITUTE  
WARWICK WORKSHOPS**

**Quantisation**

A research workshop on Quantisation will be held from 24-28 July 2000 at the Mathematics Institute, University of Warwick. It will cover recent results in quantisation and related areas of symplectic and Poisson geometry. The organiser is J. Rawnsley.

**Geometry and Analysis on Path Spaces and Related Fields**

A workshop will be held on Geometry and Analysis on Path Spaces and Related Fields from 24-29 July 2000. The scientific organising committee is K.D. Elworthy (Warwick), L. Gross (Cornell), A. Jaffe (Harvard), J.D.S. Jones (Warwick), M. Rockner (Bielefeld). It is an official Satellite meeting of the XIII International Congress of Mathematical Physics. The principal aim of the workshop is to bring together specialists in stochastic analysis, topology and related aspects of mathematical physics to discuss techniques, constructions, and problems, on path spaces of manifolds, especially loop spaces and also more general geometric field theories. It will be parallel to, and will interact with, the Quantisation workshop.

Visit <http://www.maths.warwick.ac.uk/research/programmes/current> for more details about these workshops. E-mail [peta@maths.warwick.ac.uk](mailto:peta@maths.warwick.ac.uk) to be put on the mailing list or for accommodation/participation forms. These workshops are supported by the EPSRC and LMS with special provision for UK registered graduate students.

**ICMS Workshop**

**MODEL -THEORETIC ALGEBRA AND ALGEBRAIC  
MODELS OF COMPUTATION**

**Edinburgh, 4-15 September 2000**

**Organising Committee:** Felipe Cucker (Hong Kong), Pascal Koiran (Lyon), Angus Macintyre (Edinburgh), Christian Michaux (Mons).

The aim of the workshop is to promote interaction between researchers in model-theoretic algebra and those working on various algebraic models of computation. Special emphasis will be placed on differential geometric and algebraic geometric techniques, which have been basic in both traditions. The most formal part of the Workshop will be intensive introductory lectures to acquaint each group with the other's goals and achievements. There will also be ample opportunity for informal work in small groups.

Anyone interested in attending the workshop should contact Professor Angus Macintyre ([angus@maths.ed.ac.uk](mailto:angus@maths.ed.ac.uk)) or Tracey Dart ([tracey@maths.ed.ac.uk](mailto:tracey@maths.ed.ac.uk)). The workshop is supported by the EPSRC. The address of the meeting's home page is: <http://www.ma.hw.ac.uk/icms/current/mta/index.html>

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e-mail: [icms@maths.ed.ac.uk](mailto:icms@maths.ed.ac.uk)

## HARMONIC MORPHISMS AND HARMONIC MAPS

The second international conference primarily dedicated to harmonic morphisms will be held at the Centre International de Rencontres Mathématiques in Luminy, France from 28 May - 1 June 2001. Though centred on harmonic morphisms, neighbouring themes in harmonic maps will also be represented with lectures from leading experts. The study of harmonic morphisms between Riemannian manifolds first began in earnest with the pioneering work of Fuglede and Ishihara in 1979 and independently by the probabilists Bernard, Cambell and Davie. Since that time the harmonic morphism bibliography (<http://www.maths.lth.se/matematiklu/personal/sigma/harmonic/bibliography.html>) has grown to more than 170 publications and the prominence of the subject continues to grow, providing rich interactions between harmonic maps, minimal surface theory, low dimensional topology, probability theory and theoretical physics.

Members of the organising committee are: M. Ville (Ecole Polytechnique), E. Loubeau (Brest), S. Montaldo (Cagliari). Scientific Committee: J. Eells (Cambridge), L. Lemaire (Brussels), J.C. Wood (Leeds). If you wish to attend the conference please contact M. Ville ([ville@math.polytechnique.fr](mailto:ville@math.polytechnique.fr)). It would be helpful if you could indicate whether you would like to be considered for financial assistance with travel expenses. Some financial help will be available. The conference web page is located at: <http://beltrami.unica.it/harmor/>.

## STATISTICAL MECHANICS 2000

A satellite meeting will be held at St John's College, Cambridge from 9 to 12 August as part of the International Congress on Mathematical Physics. The meeting is supported by the London Mathematical Society, St John's College and the European Science Foundation.

Participants include:

- P. Bleher (University of Indiana)
- E. Bolthausen (University of Zurich)
- A. Bovier (WIAS, Berlin)
- A. van Enter (University of Groningen)
- F. den Hollander (University of Niemegen)
- F. Martinelli (University of Rome-3)
- S. Shlosman (CPT CNRS, Marseille-Luminy)
- G. Slade (University of British Columbia)
- Y. Suhov (University of Cambridge)
- V. Zagrebnoy (CPT CNRS, Marseille-Luminy)
- M. Zahradnik (Charles University, Prague)

For further information contact Y.M. Suhov ([y.m.suhov@statslab.cam.ac.uk](mailto:y.m.suhov@statslab.cam.ac.uk)).

## ICTMA 10

The 10th International Conference on the Teaching of Mathematical Modelling and Applications (ICTMA 10) will take place at Tsinghua University, Beijing, China from 29 July - 2 August 2001. The aim of this conference is to provide a forum for the presentation and exchange of information, experiences, opinions and ideas relating to the teaching, learning and assessment of mathematical modelling, mathematical models and applications of mathematics.

For further information visit the conference web site (<http://www.csiam.edu.cn/ictma10/>).

## NEWS FROM DE MORGAN HOUSE

### Members' Computer

A computer is now available in the Verblunsky Room (Members' Room) for members to use e-mail, telnet and ftp. Register with Lee-Anne Taylor, the receptionist, on arrival.

### Change of Post Code

Royal Mail has informed us that with immediate effect they have changed the London Mathematical Society postcode from WC1B 4HP to WC1B 4HS.

Isaac Newton Institute for Mathematical Sciences and  
Warwick MRC joint Workshop

## SINGULARITIES IN CLASSICAL, QUANTUM AND MAGNETIC FLUIDS

20-23 October 2000

Mathematics Institute, University of Warwick

The aim is to initiate an exchange of ideas and methods of studying singularities among researchers working in different fields, such as classical Euler and Navier-Stokes fluids, superfluids, magneto-hydrodynamics and fluid-like nonlinear properties of optical media. This meeting will also review known singularities in fluid systems, and examine the current status of existing open questions. The conference is a satellite workshop of a programme on Geometry and Topology of Fluid Flows organized at the Isaac Newton Institute for Mathematical Sciences (Cambridge).

### Organisers:

R.S. MacKay, X. He, S. Nazarenko (Warwick), R. Pelz (Rutgers University).

### Invited Speakers (provisional programme):

- Friday afternoon: Fluids. R. Pelz (Rutgers), E.A. Kuznetsov (Moscow), H.K. Moffatt (Cambridge; Warwick Colloquium).
- Saturday morning: Fluids. H. Okamoto (Kyoto), R. Grauer (Dusseldorf), D. Cordoba (Chicago), M. Vishik (Texas).
- Saturday afternoon: Fluids. P. Constantin (Chicago), J.D. Gibbon (Imperial College), S.J. Cowley (Cambridge), J.C. Vassilicos (Cambridge).
- Sunday morning: Fluids. J.T. Stuart (Imperial College), V. Yudovich (Rostov), A. Shnirelman (Tel Aviv).
- Sunday afternoon: NLS. A.C. Newell (Warwick), A.M. Rubenchick (Livermore), J.J. Rasmussen (Riso).
- Monday morning: NLS/MHD. U. Frisch (Nice), S. Turitsyn (Aston), A. Bhattacharjee (Iowa), S.C. Cowley (UCLA).
- Monday afternoon: MHD. R. Kerr (NCAR), C.F. Barenghi (Newcastle), V.E. Zakharov (Landau and Arizona).

**Poster Sessions:** There will be Poster Sessions on Saturday and Sunday, at which all participants are invited to present a poster. All who would like to present a poster, please send your title to [xinyu@maths.warwick.ac.uk](mailto:xinyu@maths.warwick.ac.uk).

**Participation:** UK participants are especially encouraged to attend. In addition, there are grants available for part support of up to 10 UK PhD students to attend the meeting.

**Further Information:** Available from the web (<http://www.maths.warwick.ac.uk/research/programmes/current>), or contact Mrs Peta McAllister ([peta@maths.warwick.ac.uk](mailto:peta@maths.warwick.ac.uk)).

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## RECORDS OF PROCEEDINGS AT MEETINGS

### JOINT MEETING OF THE LONDON MATHEMATICAL SOCIETY AND THE BRITISH SOCIETY FOR THE HISTORY OF MATHEMATICS

held on *Friday 19 May* and *Saturday 20 May 2000* at the Mathematical Institute, Oxford, Professor M. J. TAYLOR, FRS, President, in the Chair. There were present about 120 members and visitors for all or part of the meeting.

Twelve people were elected to Ordinary Membership: P.C. Chatwin, C. Constanda, A. Fakharzadeh Jahromi, R.G. Halburd, S.J. Harding, J.P. Keating, D. Mandic, S.P. Marshall, N.C.V. Pollock, A. Pushnitski, A.N. Skorobogatov, A.K. Sturm; and four people were elected to Reciprocity Membership: E. Buckwar, R.J. Cowen, K.C. Goyal, H-C. Stuwe.

A lecture was given by J.J. Gray, 'Hilbert, Göttingen and the reputation of the problems'.

After tea, six members signed the book and were admitted to the Society. The following lectures were given: D.B. Rowe, 'Geometry, axiomatisation and foundations (the first six problems)' and W.H. Woodin, 'The continuum hypothesis'. The meeting then adjourned.

In the evening, a dinner was held at St Cross College attended by 30 people.

On Saturday morning, the Chair was taken by Dr P.M. NEUMANN, President of the British Society for the History of Mathematics and then by Dr N.M.J. Woodhouse, the Meetings and Membership Secretary. Lectures were given by S.K. Donaldson, FRS 'Geometry'; N. Schappacher 'Hilbert on number theory and modern algebra'; D. Zagier, 'Number theory'; C. Fraser, 'Hilbert and analysis (Problems 19 to 23)' and J.M. Ball, FRS 'Analysis (Calculus of variations)'. The Meetings and Membership Secretary thanked the local organisers, and in particular Dr Neumann, and closed the meeting.

## LMS PROGRAMME AND CONFERENCE FUND

The Society's Programme and Conference Fund is used to give financial support to various mathematical activities in the UK. Grants are made under five main headings, which are set out in summary form below. The information is available on the Society's web site at ([http://www.lms.ac.uk/activities/prog\\_com/index.html](http://www.lms.ac.uk/activities/prog_com/index.html)) and also on pp 24-27 of the "Handbook and List of Members", which you should have recently received.

Only Society members are eligible for Scheme 4 grants. Otherwise, any mathematician working in the UK is eligible for a grant; applications from non-members must be countersigned by a Society member. Applications for conference grants must be submitted on the appropriate form, available either from the Society's Office ([grants@lms.ac.uk](mailto:grants@lms.ac.uk)), or from the Society's web site at the address above. In all other cases, applications should be made by letter, including (as appropriate) the academic case, details of participants and activities, places to be visited, the proposed timetable and a budget of estimated costs. Applications should be sent to Dr N.M.J. Woodhouse, Meetings & Membership Secretary at De Morgan House, 57-58 Russell Square, London WC1B 4HS (Secretary, Mrs S. Daly, tel: 0207 637 3686; e-mail: [grants@lms.ac.uk](mailto:grants@lms.ac.uk); fax: 0207 323 3655). Further information and advice can be obtained from her or from Dr N.M.J. Woodhouse (e-mail: [nwoodh@maths.ox.ac.uk](mailto:nwoodh@maths.ox.ac.uk)).

Type of Grant	General Purpose	Amount	Deadlines
Conference	Support of conferences within the UK. The grant may be either a substantial contribution to a small meeting or a small contribution to a large meeting.	Up to £5000 (including £1000 to support research students and £1000 to support Scheme 5 participants).	31 January, 31 May and 31 August
Scheme 2	Support for a foreign visitor who will give lectures at three places in the UK.	Return travel to UK up to a maximum of £1000.	At least three months before the visit
Scheme 3	Support of incidental costs for collaborative work by research groups from three (or more) different places.	Travel or other costs up to £1000 for one year.	31 January, 31 May and 31 August
Scheme 4	Support of travel and subsistence costs incurred by a UK member or their collaborator in carrying out joint research.	Up to £500.	31 January, 31 May and 31 August
Scheme 5	Support of visits to UK by mathematicians from the following countries of the former Soviet Union; Eastern Europe including former Yugoslavia, Africa, China, India, Pakistan and Bangladesh.  Also support of visits to these countries by UK mathematicians.	Basic travel up to £500 and living expenses up to £1400.  Up to £1200.	At least three months before the visit

Grants awarded since January 2000:

CONFERENCE

Topic	Applicant	Grant £
Postgraduate Combinatorial Conference 2000	C.G. Rutherford	971
Tableaux 2000: Automated Reasoning with Analytic Tableaux and Related Matters	R. Dyckhoff	1250
20th European Dynamics Days 2000	P.J. Aston	2400
Combinatorics One-day Meeting	A.D. Scott	600
Sixth International Symposium on Effective Methods in Algebraic Geometry	N. Vorobjov	3000
Scottish Conference in Algebraic Topology (SCAT)	R. Levi/G. Arone	4000
International Symposium on Symbolic and Algebraic Computation	M.D. Atkinson	1500
Qualitative Properties of Dissipative PDE's	M.D. Bartuccelli S.A. Gourley	995
Geometry of Quiver Representations and Preprojective Algebras- Summer School	K. Erdmann	2000
Travelling Fronts and Patterns	S.A. Gourley	420
Function Theory and Function Spaces	J.K. Langley J.F. Feinstein	816
Advanced Research Workshop on Finite Geometries	J.W.P. Hirschfeld	2000
BHSM Research in Progress	J. Stedall	300
Singularities in Classical, Quantum and Magnetic Fluids	R. MacKay	3675
Reading One-day Combinatorics Colloquium	A.J.W. Hilton	400
37th European Study Group with Industry	A.S.I. Zinober	2500
Scottish Algebra Day	J. Howie	1220
4th Informal UK Meeting on 2D Integrable Models and Conformal Field Theory	R. Weston	1305
Inverse Problems and Emerging Techniques in Materials Characterization	A.R. Davies	1000
Applications of Singularity Theory to Geometry	J.W. Bruce	5000
Geometry and Analysis on Path Spaces and Related Fields	K.D. Elworthy	2000
History of Cryptography	J.V. Field	1700
Statistics of Directions, Shapes and Images	J.T. Kent	4000
Dynamical Systems 2000	A. Khanin	2000
Joint London-Sussex-Southampton Topology Meeting, and Frankfurt-Southampton Workshop on Dessins d'Enfants and Geometric Aspects of Group Theory	G.A. Jones	2000
EMS Summer School on New Analytic and Geometric Methods in Inverse Problems and Euro Conference on Recent Developments in Wave Field and Diffuse Tomography Inverse Problems	Y. Kurylev	4870
2nd International Conference on Boundary Integral Methods: Theory and Applications	I.G. Graham	2000
53rd British Mathematical Colloquium (BMC 2001)	D.R. Fearn	9000
Quantum Probabilities and Paradoxes of the Quantum Century	V. Belavkin	1700

**SCHEME 2**

<b>Applicant</b>	<b>Visitor</b>	<b>Places to Visit</b>	<b>Grant £</b>
I. Roulstone	E.S. Titi	Imperial College, Cambridge, Reading & Meteorological Office	500
J.D.M. Wright	K.D. Bierstedt	Goldsmiths College, Oxford & Reading	300
J.D.M. Wright	J. Bonet	Goldsmiths College, Oxford & Reading	300
D.B. Duncan	W. Hundsdorfer	Dundee, Strathclyde & Heriot-Watt	400
R.A. Doney	L. Chaumont	Bath, Warwick & Manchester	220
A.J. Wilmott/ P. Smith	P. Ripa	Keele, UCL & Southampton	650
A. Grigor'yan	M. Murata	Imperial College, Cambridge & King's Collge London	970
S. Reich	G. Froyland	Surrey, Warwick & UMIST	250
Z. Lykova	G.G. Kasparov	North British Functional Analysis Seminar	200
C.M. McGregor	J. Duncan	Glasgow, Edinburgh & Yorkshire Functional Analysis Seminar	500
A. Grigor'yan	L. Saloff-Coste	Oxford, Imperial College & King's College London	390

**SCHEME 3**

<b>Applicant</b>	<b>Institution</b>	<b>Topic</b>	<b>Grant £</b>
J.P.C. Greenlees	Sheffield	Transpennine Topology Triangle (TTT)	1000
J.S.W. Lamb	Imperial College	Mechanics & Symmetry in Europe (MASIE)	750
A. White	Heriot-Watt	Understanding & Applying the Theory of Adaptive Dynamics	1000

**SCHEME 4**

<b>Applicant</b>	<b>Institution</b>	<b>Collaborator</b>	<b>Institution</b>	<b>Grant £</b>
A.J. Duncan	Newcastle	G. Baumslag/ G. Myasnikov	CUNY	500
W.J. Zakrzewski	Durham	P. Winternitz	Montreal	500
C.J.K. Batty	Oxford	R. Chill	Ulm	360
J.R. Partington	Leeds	I. Chalendar	Lyon	400
H.D. Macpherson	Leeds	C. Steinhorn	New York	500
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A. Sudbery	York	C. Isham, L. Smolin, J. Halliwell, K. Savvidou & A. Beige	Imperial	360
J.S. Pym	Sheffield	P. Milnes	Western Ontario	400
B.D. Mestel	Exeter	A.H. Osbaldestin	Loughborough	400

## SCHEME 5

Applicant	Visitor	Institution	Places to Visit	Grant £
T. Lyons	F. Kolaneci	Albania	Oxford	1367
J.C. Eilbeck	E. Belekolos	Kiev	Heriot-Watt	1050
F.M. Borodich	D.A. Onishchenko	Moscow	Liverpool, Strathclyde & Glasgow Caledonian	1800
K. Erdmann	C. Saenz	Guanajuato Mexico	Oxford	380
T.J. Bridges	A. Afendikov	KIAM Moscow	Surrey	970
A.J. Wilkie	J. Krajicek	Czech Republic	Oxford	1400
M. Levitin	P. Exner	Czech Republic	Heriot-Watt, Sussex & King's	750
V.A. Galaktionov	S.R. Svirshchevskii	KIAM Moscow	Bath	1600
Y.A. Antipov	V.V. Silvestrov	Chuvash State	Bath	1450
S.B. Kuksin	V. Oseledets	Moscow	Heriot-Watt	1500
L. Fradkin	V.S. Buldyrev	St. Petersburg State	South Bank	1000
P.E. Newstead	J. Bhosle	Mumbai	Liverpool	1360

Applicant	Visiting	Institution	Places to Visit	Grant £
L. O'Carroll	T. Winiarski	Krakow	Krakow	260
D. Robinson	A. Trautman	Warsaw	Warsaw	200
H. Braden			Moscow and nearby institutes	1040

## 2001 BMS-DMV MEETING

The Belgian Mathematical Society and the Deutsche Mathematiker Vereinigung will hold their first joint meeting at the University of Liège from 8-10 June 2001. The aim is to set up a conference with six Plenary Talks of 50 minutes and 10-12 Special Sessions.

I. Daubechies (Princeton, USA), C. Deninger (Münster, Germany) and P. Deufhard (Berlin, Germany) have already agreed to deliver Plenary Talks.

The following six Special Sessions (and organizers) have already been fixed:

1. Arithmetic Geometry (G. Cornelissen, A. Huber, K. Künnemann, W. Veys);
2. Functional Analysis and Functional Analytic Methods in Partial Differential Equations (K.D. Bierstedt, P. Laubin, R. Meise, J. Schmets);
3. Global Analysis (J. Brüning, L.

- Lemaire);
4. Optimization (M. Goemans, M. Grötschel, Ph. Toint, J. Zowe);
  5. Ordinary Differential Equations and Dynamic Systems (F. Dumortier, B. Fiedler, J. Mawhin, J. Scheurle);
  6. Representation Theory (D. Happel, C. Ringel, F. Van Oystaeyen, A. Verschoren).

Information on the meeting can be found on the homepage (<http://math-www.uni-paderborn.de/Liege2001/>). Everybody interested in participating at the meeting is kindly asked to preregister by sending an e-mail ([bmsdmv@upb.de](mailto:bmsdmv@upb.de)) mentioning their name, institution, e-mail address and 2001 BMS-DMV Meeting. All mathematicians who have pre-registered this way for the meeting will automatically receive the Second Announcement of the meeting in October 2000.

PA – Probability and its Applications

**Demuth M.**, Technische Universität Clausthal, Germany  
**van Casteren, J.A.**, University of Antwerp, Belgium

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PM – Progress in Mathematics 189

**André, Y.**, Université Pierre et Marie Curie, Paris, France / **Baldassari, F.**, Università di Padova, Italy

**Da Rham Cohomology of Differential Modules on Algebraic Varieties**

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PM – Progress in Mathematics 190

**Essen van den, A.**, University of Nijmegen, The Netherlands

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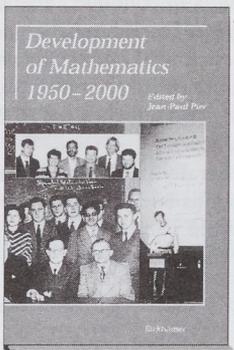
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**Pier, J.-P.**, Centre Universitaire de Luxembourg (Ed.)

**Development of Mathematics 1950–2000**

The past fifty years have witnessed a dramatic growth of mathematical research, the evolution of ideas and new branches. It has become virtually impossible for any mathematician to keep track of all these developments even at a superficial level. This unique book not only attempts a history of contemporary mathematics, but also provides some authoritative guidance through the maze of mathematical theories. Neither encyclopaedic nor superficial, it addresses a rich range of topics from the personal viewpoint of more than forty mathematicians, most of them active researchers and renowned specialists in their fields. The volume is complemented by relevant statistical and bibliographic material and illustrated with some 200 portraits of mathematicians. Together with *Development of Mathematics 1900–1950* (edited by J.-P. Pier, Birkhäuser 1994) it constitutes a comprehensive reference work of lasting value on the unfolding of mathematical concepts in the twentieth century.

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Pier, J.-P. (Ed.)

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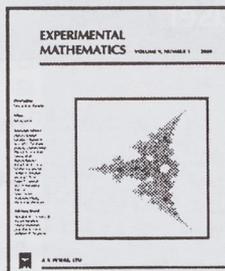


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# The Journal of Experimental Mathematics

An open letter from the editors of  
*The Journal of Experimental  
Mathematics*:



To the Reader:

We are proud to present what may well be the best issue of *Experimental Mathematics* yet. It is certainly the thickest: starting with this issue, we will be publishing about 640 pages a year instead of the 420 of last year. This expansion was motivated by our backlog, which has built up due to a large number of first-rate submissions.

In fact, the amount of material in our quarterly issues has been growing all along, with a 30% increase in the number of pages from 1992 to 1999 and an enlargement in the page format between 1998 and 1999.

This year's more dramatic change attests to the maturity of the journal and to our commitment to timely publication of accepted papers. Even better, there was no price increase from 1999 to 2000 for institutional subscriptions, while our individual subscriptions remain a bargain.

However, it is likely that in 2001 prices will have to go up. The best way to minimize this increase is to continue expanding the subscriber base. *If your library does not yet subscribe to Experimental Mathematics, why don't you take the time now to make a recommendation?*

Improvements are also in the works for our electronic distribution at [www.expmath.org](http://www.expmath.org), including text searches and PDF full-text files (we offer Postscript full-text files now).

In today's climate of generally predatory journal pricing, *Experimental Mathematics* stands out as one example of how a distinguished editorial board and a responsible publisher can cooperate to put out a high-quality journal at a very moderate price.

David Epstein, Chief Editor  
Silvio Levy, Editor

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Volume 9, 2000  
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## BOOK REVIEW

**Five More Golden Rules: Knots, Codes, Chaos, and other Great Theories of 20th Century Mathematics** by John L. Casti, 268 pp, £18.50, ISBN 0-471-32233-4, John Wiley & Sons, New York, 2000.

This book is a sequel to the author's "Five Golden Rules", described by the Reviewer in *LMS Newsletter* No. 260. There, he had given himself the interesting philosophical exercise of choosing five theorems of the first half of the 20th Century (such as Brouwer's fixed point theorem), which had developed into organising centres for highly important theories. (Enough time had elapsed for the importance of the theorems to be clear.) Each of his present choices is similarly about a coherent theory, but which more often contains a cluster of theorems rather than one mighty one; and they belong more to the later part of the century.

For example, something of the nature of the author's choices can be seen from the chapter headings: (1) The Alexander Polynomial: Knot-Theory, (2) The Hopf Bifurcation Theorem: Dynamical System Theory, (3) The Kalman Filter: Control Theory, (4) The Hahn-Banach Theorem: Functional Analysis, (5) The Shannon Coding Theorem: Information Theory. Each chapter involves "applied mathematics" in the North American style, with much "modern" pure mathematics; there is no chapter on one of the big divisions of "British" applied mathematics - electrical theory, fluid dynamics, elasticity, shock-waves - of the sort we learned in Manchester in the late 40's. I wonder what our applied colleagues in Britain would nowadays choose to include, and (given their temperament and the nature of their subject) whether we could expect any consensus from them.

As before, the author has written a very readable book, and tries to keep down the technical level, especially by choosing unusual motivating examples. His choice for chapter 1 is surprising at

first sight until we see the electron micrographs of DNA Knots, and the description of a real molecule that has the structure of a Moebius band. An interesting appendix describes recent techniques for associating an energy with a knot which are reminiscent of 19th Century thinking by Kelvin and Tate (who considered knots for reasons of physical theory). This material comes after the necessary "Pure" mathematics: to show the need for invariants of knot-type, we have knot-equivalence in intuitive terms, knot-colourings, Reidemeister moves, the algorithm for the Alexander polynomial, and a brief description of progress stemming from the Jones polynomial.

To introduce chapter 2, a treasure hunt is used as an example of a dynamical system, before giving technical discrete and continuous examples; these range from population dynamics, to the growth of plants, and clocks, and set the stage for describing the stability of linear vector fields, and their periodic orbits. Then come the topics one would expect: local linearity, the Hartmann-Grobman theorem, and the centre manifold theorem, and of course the technical level has increased, but it is handled nicely. Next comes bifurcation in 1-parameter families of fields, to introduce the birth of limit cycles via the Hopf-bifurcation theorem. Then we move to gradient fields, to link up with the singularity theory in the author's earlier book (which he assumes we have read), and there is a brief section on the cusp catastrophe. The baker's transformation is illustrated via reduction mod 10 on the circle, which uses Champernown's number  $0.123\dots n\dots$  to give a neat example of sensitivity to initial conditions, from which we go to "Period 3 implies Chaos" and Sharkovskii's Theorem. After applications involving planets, and fluctuations in gold prices, the author turns to fractals, with an example of fractal reduction of some music by Bach, before conclud-

ing with some standard pictures related to the Mandelbrot set.

Probably, most readers of this review will, like the reviewer, be less familiar with the Kalman filter than anything else in the book, and space forbids the necessary detail here. Suffice it to say that an example is to find the best estimate of a discrete variable  $x_k$  given  $y_k = Hx_k + v_k$  and  $x_{k+1} = Fx_k + Gu_k$ , where  $u_k$  represents noise. To lead up to this, the author takes us through some control theory along the lines of the previous chapter, moving from linear to non-linear problems, with examples involving sharks and minnows, a child pumping a swing, the brachistochrone, and landing a spaceship on Mars. He states the Pontryagin minimum principle, and compares it with the approach of Bellman in dynamic programming; and points out the occurrence of a type of duality between various matrices that appear.

Chapter 4 is partially intended to illustrate the power of abstraction and generalisation in mathematics; the reader might first pause to consider what she/he would do here. The author's illustration is based on geometry, moving from plane geometry to  $n$ -space and then to metric, Banach and Hilbert space. (The notions of limit and completeness are left a bit vague, but suffice as there are no formal proofs of the theorems.) Examples from game theory, heat problems and Kepler's equation are used to give the idea of a functional. Pictures illustrate projection theorems for linear varieties and convex sets, and then we get the Hahn-Banach theorem, contraction mapping and Newton's method, the spectral theorem, and the Fredholm alternative. (A couple of pages describe the creative interaction of Banach and friends in the Scottish cafe, in Lwow, prior to (unmentioned) Nazi intervention.) There is a sketch of how to use Hilbert space for setting fluid dynamics, and the Schauder-Leray principle is explained, with an assertion that it can be used for proving the existence of a solution to the Navier-Stokes equations. (This section is entitled "The importance

of being non-linear", but the evidence supplied shows only the importance of designing methods to solve non-linear problems.) A version of quantum theory is also put into this setting, and the uncertainty principle is deduced from the axioms.

After discussing the information content of Paul Revere's signals in the US War of Independence, chapter 5 describes the genetic code with other examples to introduce standard results on coding theory, culminating with Shannon's theorem. Moving on to randomness, information and computation, we have a last section entitled "Zipf up that Lip". (Several such examples of (American-style) humour occur.) This has the last of the book's many intriguing examples, and deduces, "from information-theoretic reasoning", the power law form of Zipf's law (which concerns the relationship between the rank order and frequency of words in natural language).

Popular expositions of technical matters always involve a delicate balance between precision and readability, and in fairness an upset reader must always think whether he/she could have solved the author's expository problems in a better way. But some less subjective (and minor) criticisms of the book are possible. I noticed few misprints, but the statement of "Alexander's polynomial invariant theorem" contains two *non-sequiturs*. Also the exponential of a matrix appears in chapter 2, and is explained only in chapter 3, wherein the previous vector fields  $v(x)$  are now given as  $dx/dt$  without appropriate comment. (Indeed, at times, the author writes as if for knowledgeable engineers.). But a second edition can easily make repairs, and for mathematically literate readers who wish to know more about contemporary mathematics, or to find interesting examples to motivate their lectures, it seems to me that the author has once more done an excellent job.

Brian Griffiths  
Southampton University

# Cambridge Journals



LMS Journal of Computation and Mathematics  
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## ICMS Instructional Conference

### NONLINEAR PARTIAL DIFFERENTIAL EQUATIONS

Edinburgh, 8-18 January 2001

#### Organising committee

J.M. Ball (Oxford), M.J. Esteban (Paris), J.F. Toland (Bath).

#### Scientific programme

The aim of this 10-day course is to instruct young mathematicians on modern methods for nonlinear PDE theory, where the motivation comes from important new areas in applied science, including image processing, materials science, gas and fluid dynamics, and quantum mechanics of atoms and molecules. Although this set of topics has been selected for detailed analysis, the methods are universal in their scope.

Talks will be presented at three levels. Around one-third of the total time will be spent presenting basic methods and applying them to prototypical examples which illustrate both their power and their limitations. This material will be suitable for students at the start of their postgraduate studies. Talks at the intermediate level will be devoted to refining these basic methods to cover more subtle and complex situations. The series of more advanced lectures will review recent developments and current research. Speakers will include:

A. Aftalion (ENS Paris)	C. Le Bris (Ecole Nationale des Ponts et Chaussees)
L. Ambrosio (Pisa)	A. Quarteroni (EPFL Lausanne)
J.M. Ball (Oxford)	C.A. Stuart (EPFL Lausanne)
Y. Brenier (Paris VI)	V. Sverak (Minneapolis)
G.R. Burton (Bath)	J.F. Toland (Bath)
V. Caselles (Barcelona)	N. Touzi (Paris)
M.J. Esteban (Paris Dauphine)	N.S. Trudinger (Canberra)
J. Kristensen (Heriot Watt)	

#### Supporting institutions and organizations

Engineering and Physical Sciences Research Council of the United Kingdom  
EC Framework V.

The meeting website contains detailed information, including a provisional timetable and registration forms. You can locate it via the current ICMS programme site: <http://www.ma.hw.ac.uk/icms/current/>

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## Isaac Newton Institute for Mathematical Sciences

### SYMMETRIC FUNCTIONS AND MACDONALD POLYNOMIALS

(January to July 2001)

**Organisers:** P. Hanlon (Michigan), I.G. Macdonald (Queen Mary & Westfield), A.O. Morris (Aberystwyth).

**Programme Theme:** In the 1980s, I.G. Macdonald formulated a series of conjectures which predicted the constant terms of expressions that involve an important new class of symmetric functions called the Macdonald polynomials. Since their introduction, these conjectures and polynomials have been a central topic of study in Algebraic Combinatorics. Of particular note has been the variety of approaches used in efforts to solve the conjectures or to find an algebraic or geometric interpretation for the Macdonald polynomials themselves. Different approaches involve double affine Hecke algebras, homology of nilpotent Lie algebras, generalised traces of Lie algebra representations and diagonal actions of the symmetric group on polynomial rings in two sets of variables. In this programme we will attempt to unify these different approaches to the Macdonald polynomials in a way that allows for a significant interpretation of these polynomials and settles some of the outstanding conjectures that have resulted from this work. Links with other areas such as algebraic geometry, Lie algebras, non-commutative algebra, mathematical physics and mathematical statistics will be emphasised.

#### Workshops:

- |                |  |
|----------------|--|
| 8-12 January   | Introductory and Survey Conference - Interpretations of Macdonald Polynomials                |
| 16-21 April    | Affine Hecke Algebras, Macdonald Polynomials and their connections with Mathematical Physics |
| 25 June-6 July | Symmetric Functions 2001; Surveys of Developments and Perspectives                           |

Additional smaller workshops could also be organised, for example, The Garsia-Haiman Conjectures and Lie Algebra Homology.

**Participation:** If you are interested in possible participation in this six-month research programme, please contact Professor P. Hanlon ([hanlon@math.lsa.edu](mailto:hanlon@math.lsa.edu)) or Professor A.O. Morris ([aom@aber.ac.uk](mailto:aom@aber.ac.uk)), specifying which part of the programme you are interested in and funding needs and/or sources of financial support. Additional support especially for young participants has been obtained from EC sources. Please also supply a brief *curriculum vitae*.

The list of invited participants so far includes: S. Ariki (Tokyo), R. Askey (Wisconsin), C. Bessenrodt (Magdeburg), I. Cherednik (N. Carolina), C. Dunkl (Virginia), S. Fomin (Michigan), A. Garsia (San Diego), M. Haiman (San Diego), P. Hanlon (Michigan), G. Heckman (Nijmegen), T. Josefiak (Michigan), A. Kerov (St Petersburg), T.H. Koornwinder (Amsterdam), S. Kumar (North Carolina), L. Lapointe (Montreal), A. Lascoux (Marne-la-Vallee), B. Leclerc (Caen), G.I. Lehrer (Sydney), J.-L. Loday (Strasbourg), I.G. Macdonald (Queen Mary & Westfield), A.O. Morris (Aberystwyth), M.L. Nazarov (York), G. Olshanskii (Moscow), J.B. Olsson (Copenhagen), A. Okounkov (Berkeley), E. Opdam (Leiden), P. Pragacz (Torun), A. Ram (Wisconsin), B.E. Sagan (Michigan State), S. Sahi (Rutgers), B. Srinivasan (Chicago), R. Stanley (MIT), J.R. Stembridge (Michigan), C. Teleman (Cambridge), J.-Y. Thibon (Marne-la-Vallee), M. Wachs (Florida), A. Zelevinsky (Northeastern).

**Further information** is available at <http://www.newton.cam.ac.uk/sfm.html>.

To join the programme e-mail list, please send the message  
<subscribe sfm-list> to [majordomo@newton.cam.ac.uk](mailto:majordomo@newton.cam.ac.uk)



## FORTHCOMING CONFERENCES

### **NINTH MATHEMATICS OF SURFACES**

*Cambridge, UK 4 – 6 September 2000*

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

*University of Salford, UK 5 – 7 September 2000*

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

*University of Bath, UK 12 – 16 September 2000*

### **AN INTERDISCIPLINARY WORKSHOP ON INNOVATIVE BOUNDARY ELEMENT TECHNIQUES IN COMPUTATIONAL ACOUSTICS AND ELECTROMAGNETICS**

*University of Bath, UK 14 – 15 September 2000*

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

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

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

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

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

*University of Warwick, UK 18 - 20 December 2000*

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

*Churchill College, Cambridge, UK 27 - 29 March 2000*

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

*University of Salford, UK 9-11 April 2001*

### **ECCOMAS 2001**

*Swansea, UK 4 - 7 September 2001*

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

*Keble College, Oxford, UK 24 - 26 September 2001*

### **FURTHER DETAILS FROM:**

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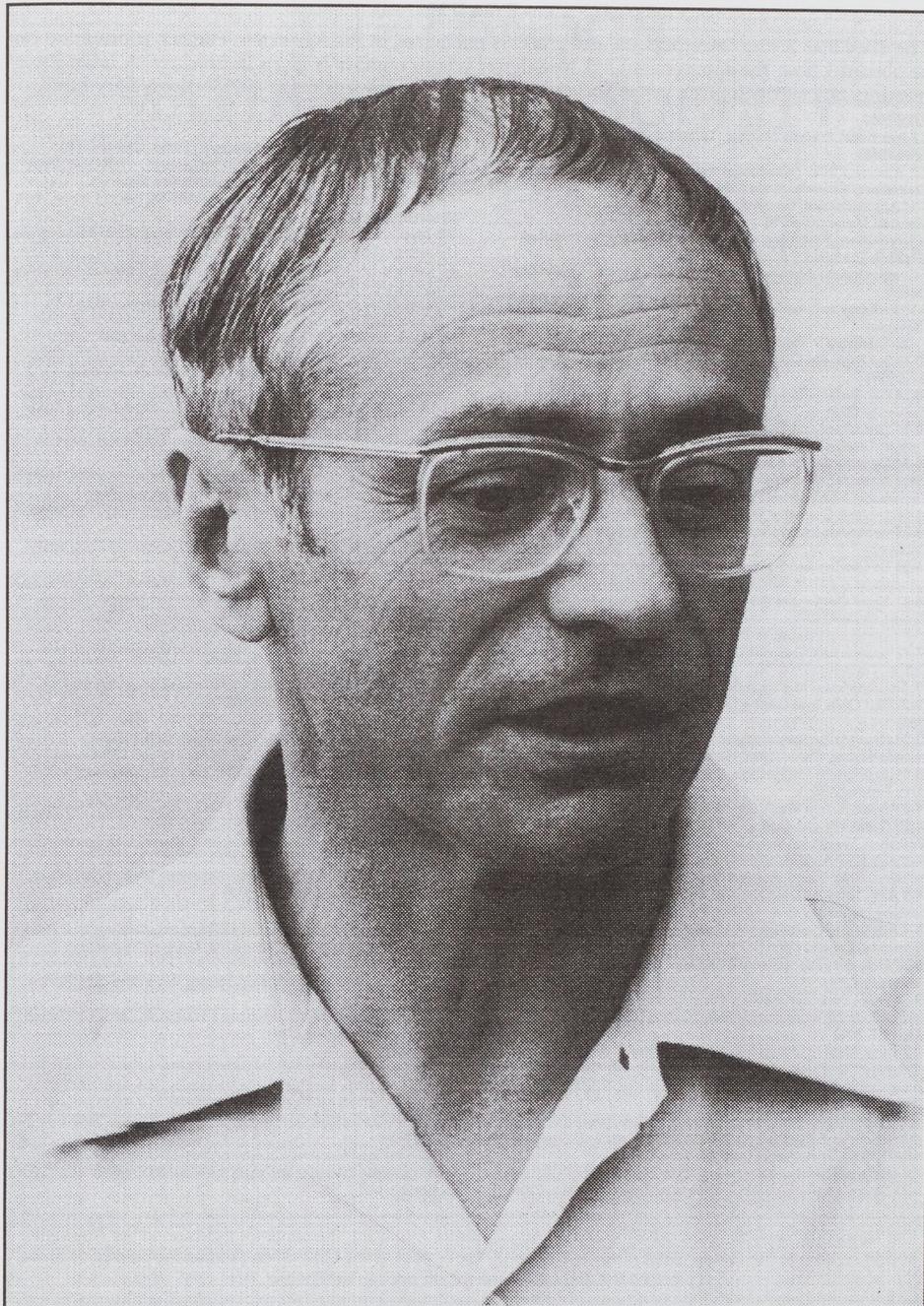
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## DIARY

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>).

### 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)
  - 4-7 Automated Reasoning with Analytic Tableaux and Related Methods Conference, St Andrews (283)
  - 6 Computational Aeroacoustics Meeting, Greenwich University (283)
  - 6-13 K-theory and Analysis, LMS Durham Symposia, Durham University
  - 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)
  - 10-14 Noncommutativity - Geometry and Probability International Conference, Nottingham Trent University (282)
  - 11-15 Spectral Geometry Workshop, Bristol University (283)
  - 13-23 Geometric Integration, LMS Durham Symposia, Durham University
  - 16-20 Diffraction and Scattering in Fluid Mechanics and Elasticity Symposium (IUTAM 2000), Manchester University (283)
  - 16-21 Finite Geometries Advanced Research Workshop, Isle of Thorns, Sussex (282)
  - 17-21 Integrable Systems in Differential Geometry, Tokyo (275)
  - 17-22 International Congress on Mathematical Physics, Imperial College, London (257) (278)
  - 18 Environmental Mathematical Workshop, IoP, London (283)
  - 19-21 Cell Cycle Immunology and Pathology Meeting, Warwick (283)
  - 22-28 New Mathematical Methods in Continuum Mechanics Euroconference, Crete, Greece (280)
  - 23-31 Association for Symbolic Logic European Summer Meeting, Paris, France (278)
  - 24-28 Quantisation Workshop, Warwick University (284)
  - 24-29 Geometry and Analysis on Path Spaces and Related Fields Workshop, Warwick University (284)
  - 24-2 Aug New Analytic and Geometric Methods in Inverse Problems, EMS Euro Summer School, ICMS Edinburgh (279)
  - 24-3 Aug Computational Number Theory, LMS Durham Symposia, Durham University
  - 24-4 Aug String Cosmology Workshop, British Columbia University, Canada (283)
  - 25-27 Frequency Assignment Workshop, MathFIT, Brunel University (283)
  - 29 - 4 Aug Curves and Abelian Varieties over Finite Fields and their Applications Euroconference, Crete, Greece (280)
- ### AUGUST 2000
- 2-18 Large Rings, Modules and Representations, Romania (281)
  - 3-5 Recent Development in the Wave Field and Diffuse Tomographic Inverse Problems EuroConference, ICMS Edinburgh (279)
  - 4-9 Stokes' Millennium Summer School, Skreen, Ireland (283)
  - 7-9 Symbolic and Algebraic Computation International Symposium (ISSAC 2000), St Andrews University (284)
  - 9-12 Statistical Mechanics Meeting, Cambridge (284)
  - 19-25 Discrete and Algorithmic Geometry Euroconference, Crete,

### Greece (280)

### SEPTEMBER 2000

- 1-4 Constantin Caratheodory Congress, Evros, Greece (279)
- 3-9 Operator Function Theory and Semigroups, Ambleside (281)
- 4-7 UMTC 2000, Sheffield Hallam University (282)
- 4-8 Partial Differential Equations, LMS/EP SRC Short Course, Bath University (283)
- 4-8 Mathematical Biology, LMS/EP SRC Short Course, Nottingham University (283)
- 4-8 Current Environmental Issues: Quantitative Methods Meeting, TIES/SPRUC 2000, Sheffield University (280)
- 4-15 Spatial Structures in Biology Summer School, Italy (279)
- 4-15 Model - Theoretical Algebra and Algebraic Models of Computation ICMS Workshop, ICMS Edinburgh (284)
- 7-9 British Logic Colloquium 2000, East Anglia University (283)
- 10-17 Geometry of Quiver-Representations and Preprojective Algebras Summer School, Isle of Thorns, Sussex University (275)
- 11-16 Set Theory and Analysis, LMS/EP SRC Short Course, Leeds University (283)
- 13-15 Royal Statistical Society International Conference, Reading University (277)
- 15-18 Physical Interpretations of Relativity Theory Meeting, Imperial College London (277)
- 18-19 Function Theory and Function Spaces Meeting, Nottingham University (283)
- 18-23 Differential Geometry International Congress, Bilbao, Spain (275)
- 19 Flexible Learning in Mathematics, Birmingham University (281)
- 27 Set Theory and its Neighbours: Games, De Morgan House, London

### OCTOBER 2000

- 12 In Search of the Ideal Knot, Spitalfields Day, Isaac Newton Institute, Cambridge (284)
- 20-23 Singularities in Classical, Quantum and Magnetic Fluids Workshop, Warwick University (284)

### NOVEMBER 2000

- 18-22 Mathematics for Living Conference, Jordan (280)
- 20 Differential Geometry in Fluid Dynamics and Dynamical Systems, BRIMS Day, Isaac Newton Institute, Cambridge (282)

### DECEMBER 2000

- 16-21 Applications of Singularity Theory to Geometry Conference, Liverpool University (283)
- 18-20 Mathematics in Signal Processing, Warwick University (279)

### JANUARY 2001

- 8-18 Nonlinear Partial Differential Equations ICMS Instructional Conference, ICMS Edinburgh (284)

### APRIL 2001

- 2-5 British Applied Mathematics Colloquium, Reading University
- 9-12 British Mathematical Colloquium, Glasgow University

### MAY 2001

- 6-13 Symmetry and Perturbation Theory Workshop (SPT2001), Sardinia (284)

- 28 - 1 June Harmonic Morphisms and Harmonic Maps Conference, CIRM, Luminy, France (284)

### JUNE 2001

- 8-10 Belgian Mathematical Society/Deutsche Mathematiker Vereinigung joint meeting, Liège University, Belgium (284)
- 19-22 Computational Intelligence: Methods and Applications Congress (CIMA 2001) University of Wales, Bangor (283)

### JULY 2001

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

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