THE LONDON MATHEMATICAL SOCIETY NEWSLETTER

No. 169 **February 1990**

FORTHCOMING SOCIETY MEETINGS

Friday 16 February 1990, Bath
H. Brezis, J.T. Lewis
Friday 16 March 1990, Burlington House
C.J. Bushnell, J. Saxl
Friday, Saturday, 18-19 May 1990, Sheffield
Two-day meeting on Functional Analysis
Friday 15 June 1990, Burlington House
L.E. Fraenkel, H.K. Moffatt
Friday 19 October 1990, Burlington House
Friday 16 November 1990, Burlington House

PROFESSOR RICHARD RADO

Professor Richard Rado, FRS, who was elected a member of the London Mathematical Society on 10th December 1936, died on 23rd December 1989 at the age of 83. He served on the London Mathematical Society Council from 1948-57, was Secretary in 1953-54 and Vice-President from 1955-57. In 1972 the Society awarded Professor Rado the Senior Berwick Prize.

JOHN WILLIAM ARCHBOLD

John W. Archbold who was elected a member of the London Mathematical Society on 10th December 1931, died on 11th December 1989.

VISIT OF DR JÖRG BRÜDERN

Dr Jörg Brüdern of the University of Göttingen will be visiting England from 26th February until 8th March. It is expected that he will lecture at Royal Holloway and Bedford New College on 27th February (contact Dr R.C. Baker), at the University of East Anglia on 5th March (contact Dr G.R. Everest) and the University of Sheffield on 7th March (contact Dr R.J. Cook).

Dr Brüdern's visit has been made possible by a Scheme 2 travel grant from the London Mathematical Society.

MONOIDS AND FORMAL LANGUAGES

This meeting will take place in the University of York from Friday 6th to Sunday 8th April 1990. Those invited to speak include: J-E. Pin, J. Sakarovitch, P. Weil (Paris VI), J.M. Howie (St. Andrews), W.D. Munn (Glasgow), J. Renshaw (Southampton), V.A.R. Gould, J.B. Fountain (York) and M.V. Lawson (Bangor).

The London Mathematical Society has awarded funds to support the conference. For further details please contact J.B. Fountain, Department of Mathematics, University of York, Heslington, York YO1 5DD.

LONDON MATHEMATICAL SOCIETY
PUBLICATIONS PERSONNEL - 1990

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Transactions of the Moscow Mathematical Society	L.W. Longdon (LMS) (1973-); joint editor.
U.K. Periodicals' Backlog	W.D. Evans, J. Wiegold (1987-91).
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D.A. Brannan
Publications Secretary

RECENT LMS PUBLICATIONS

Subharmonic Functions, Volume 2 by W.K. Hayman

Volume 1 of Subharmonic Functions was published in 1976 and constituted a development of the theory of subharmonic functions, particularly from the point of view of applications to logs of regular functions.

Subharmonic functions play an increasingly important role in differential equations and differential geometry. In this second volume, some of these applications are given, going back to the pioneering work of Ahlfors, Heins, and Kjellberg and continuing with the more recent results of Baernstein, Weitsman and others - including some material not previously published.

LMS Monograph No.20. ISBN 0-12-334802-1. 512 pp. LMS members discount price £40.50. Payment should be sent with your order to Marketing Department, Academic Press, Harcourt Brace Jovanovich Ltd, 24-28 Oval Road, London NW1 7DX.

The Restricted Burnside Problem by M. Vaughan-Lee

The restricted Burnside problem asks whether (for a given r and n) there is a bound on the order of finite r-generated groups of exponent n. This book provides the first comprehensive account of the many recent results in this area. By making extensive use of Lie ring techniques it presents a uniform treatment of the topic and as such should be invaluable for both postgraduate students and research workers wishing to work in this area.

LMS Monographs (New Series) No.5. ISBN 0-19-853573-2. 224 pp. LMS members price £20.65, plus £1.75 postage and packing. Payment should be sent with your order to the OUP Bookshop, 116 High Street, Oxford OX1 4BR.

LONDON MATHEMATICAL SOCIETY

H. Brézis (Paris)

The Gap Phenomenon and Relaxed Energy for Harmonic Maps and Liquid Crystals

J.T. Lewis (Dublin)

Large Deviations and the Asymptotics of Operator Traces

Friday 16th February 1990
at 2.30 p.m.

The meeting will be held in
Lecture Theatre 3E 2.1 Building 3 East
University of Bath

All interested are very welcome
Tea will be served at 3.30 pm

Enquiries may be addressed to Dr G.R. Burton,
School of Mathematical Sciences,
University of Bath, Claverton Down, Bath BA2 7AY.
Telephone 0225-826218

PLEASE NOTE EARLY START AT 2.30pm AND VENUE

GEORGES POITOU

Georges Poitou, Director of the Ecole Normale Supérieure, died in Paris on December 14 1989, at the age of 63. Poitou did important work in number theory, notably on duality theorems in Galois cohomology, and was a former president of the Société Mathématique de France. French mathematics also owes much to his brilliance as an administrator and organizer. He was one of the founding fathers of the University of Paris at Orsay, and was a key figure in the Orsay mathematics department for many years. He was also the driving force behind the creation of the CIRM at Luminy by the Société Mathématique de France. In 1981, he was appointed Director of the Ecole Normale Supérieure, and since then had successfully guided this great institution of French academic and intellectual life through a difficult period of modernisation and reorganization.

SCOTTISH ALGEBRA DAY

A one-day conference on Algebra will be held in Edinburgh on Friday 16th March 1990, supported by the London Mathematical Society. The speakers will be: S. Donkin (QMW), M.J. Dunwoody (Sussex), J.C. McConnell (Leeds) and J.J. Rotman (Illinois). For details contact K.A. Brown (Glasgow), J. Howie (Heriot-Watt) or T.H. Lenagan (Edinburgh).

INTERNATIONAL CENTRE FOR PURE AND APPLIED MATHEMATICS SUMMER SCHOOLS

Divergent Series in the Theory of Differential Equations, 18th June to 13th July, 1990. The course will demonstrate with simple examples, such as Airy or Liouville equations, concrete situations where divergent theories play a key role. Old and new summations methods will be introduced: Borel-Laplace summation, least term summation, and the theory of resurgent functions.

Modules, 20th August to 15th September. The theory of L-modules represents a generalization of the classsical theory of algebraic linear differential equations of one variable. It emphasizes both its geometric and algebraic aspects. Thus because of its nature and its applications, the theory of L-modules now is a fundamental chapter of algebraic geometry. This theory is involved in many other fields: singularity theory, intersection cohomolgy and perversity, Lie groups, rigid analytic geometry.

For further information and application form, write to CIMPA, 1 Avenue Edith-Cavell, 06000 Nice, France. Tel. 93.53.18.43.

UNIVERSITY OF LIVERPOOL

Chair of Pure Mathematics

The salary will be within the range for non-clinical professorial salaries, currently not less than £25,919 per annum.

Applications are invited for a Chair in the Department of Pure Mathematics. There are two chairs in the Department; the other is held by Professor C.T.C. Wall, F.R.S.

The Department works closely with the Departments of Applied Mathematics and Theoretical Physics and of Statistics and Computational Mathematics; undergraduate teaching is co-ordinated by a Board of Mathematical Studies. The Department has an excellent international reputation and attracts considerable research funding; it has been put in the top grade for research in each of the UGC/UFC assessments.

Applications together with the names of three referees, should be received not later than 15 March 1990, by The Director of Staffing Services (AS), The University, P.O. Box 147, Liverpool L69 3BX from whom further particulars may be obtained.

Quote ref. RV/573

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VISIT OF PROFESSOR D.W. STROOCK

Professor D.W. Stroock of the Massachusetts Institute of Technology is visiting the United Kingdom for two weeks in the second half of February 1990, with the support of the London Mathematical Society. He will be giving lectures on 22nd February, Department of Mathematics, King's College, London (Professor E.B. Davies); 27th February, DPMMS, Cambridge (Dr J. Norris) and 2nd March, Department of Mathematics, University of Edinburgh (Professor T.J. Lyons). Further information can be obtained from the hosts at each institution (names in brackets).

NUMERICAL METHODS

The fifth conference on Numerical Methods is being organised by the Janos Bólya Mathematical Society in Miskolc from 20th to 25th August 1990. The conference will be aimed at giving a survey on the recent results in Numerical Algebra and in Numerical Solution of Differential Equations. For further information write to Katalin Balla, Janos Bólya Mathematical Society, Pf.240, H-1368 Budapest, Hungary.

FIBONACCI NUMBERS AND THEIR APPLICATIONS

The fourth international conference on Fibonacci Numbers and their Applications will take place at Wake Forest University, Winston-Salem, North Carolina, from 30th July to 3rd August 1990. This conference is sponsored jointly by the Fibonacci Association and Wake Forest University.

Papers on all branches of mathematics and science related to the Fibonacci numbers as well as recurrences and their generalizations are welcome. Abstracts are to be submitted by 15th March 1990, while manuscripts are due by 1st May 1990. Abstracts and manuscripts should be sent in duplicate to Professsor Gerald E. Bergum, The Fibonacci Quarterly, Department of Computer Science, South Dakota State University, PO Box 2201, Brookings, SD 57007-0194, U.S.A., from whom further information may be obtained.

GRANTS IN SUPPORT OF PUBLIC UNDERSTANDING OF SCIENCE

Grants are available for new or continuing activities or initiatives directly concerned with the promotion of the public understanding of science (including mathematics, technology and engineering). Applications should be made as soon as possible on forms obtainable from the Executive Secretary (Ref: CMW), The Royal Society, 6 Carlton House Terrace, London, SW1Y 5AG. (Tel: 01-839 5561, ext. 247).

Applicants will be asked to show clearly how their proposal relates to the public understanding of science, to submit a statement of the financial basis of their proposal, to specify any related schemes in the area of the public understanding of science of which they are aware and to give an assurance that the grant applied for is not for an activity in direct competition or conflict with existing schemes. Successful applicants will be required to submit a brief written report after the event on how the grant has been used.

All applicants must be resident in the UK. The maximum sum available for an individual grant is £2500 and allocations will often be less than this amount. The closing date for applications are *31 March* and *31 October* each year: late applications will be considered at the next round.

The Council of the Royal Society is advised on suitable recipients for grants by the Committee on the Public Understanding of Science (COPUS).

BRITISH MATHEMATICAL COLLOQUIUM

The 42nd British Mathematical Colloquium will be held at the University of East Anglia, Norwich from 3 to 5 April 1990. You are reminded that the closing date for applications is 19 March, 1990. Further details may be obtained from Dr G. Everest, School of Mathematics, University of East Anglia, Norwich, Norfolk NR4 7TJ. Telephone 0603 56161 ext. 2845.

ANALYSIS AND PROBABILITY THEORY MEETING

There will be a small meeting on Analysis and Probability Theory, organised by the Mathematics Department at the University of Edinburgh, starting on Tuesday, 27th February and finishing at the end of Saturday, 3rd March. This workshop will comprise mainly members of six mathematics departments (Edinburgh, Paris VI, Orsay, Bielefeld, Bochum and Warwick), but a few other workers have also been invited. Participants will include: S. Albeverio, A. Ancona, J. Fernandez, J.F. le Gall, Y. le Jan, D. Stroock, N. Varopoulis, T. Wolff. It might be possible to accommodate a few other participants, and anyone who is interested should get in touch with Professor Terry Lyons, Department of Mathematics, University of Edinburgh. Telephone 031 667 1081, ext. 2942.

Cambridge Mathematics

Numbers, Groups and Codes

J. F. HUMPHREYS and **M. Y. PREST**

This textbook introduces the concepts of algebra via examples and relates them to their applications, particularly in computer sciences. It provides a sound, rigorous and historically relevant introduction to group theory, enabling the student to recognise mathematical patterns in other areas.

£30.00 net Hard covers 0 521 35084 0 304 pp. 1990
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Representations of Nilpotent Lie Groups and their Applications

Part 1: Basic Theory and Examples

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This is the only survey of all the basic theory developed since the pioneering work of Kirillov in 1958. Topics covered include basic Kirillov theory, algorithms for parametrizing all coadjoint orbits, C^∞ vectors for irreducible representations, the Plancherel formula, flat orbits, discrete subgroups, rationality and submanifolds.

£35.00 net Hard covers 0 521 36034 X 280 pp. 1990
Cambridge Studies in Advanced Mathematics 18

Siegel Modular Forms

H. KLINGEN

This book presents a straightforward and easily-accessible survey providing a sound basis from which the reader can study advanced works and undertake original research.

£22.50 net Hard covers 0 521 35052 2 176 pp. 1990
Cambridge Studies in Advanced Mathematics 20

Lectures on Minimal Surfaces

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'...The style is generally informal and makes for enjoyable reading...will be an invaluable aid to anyone working in field for years, and probably decades, to come.'
Bulletin of the AMS

£70.00 net Hard covers 0 521 24427 7 588 pp. 1989

For further information write to Susan Chadwick at the address below.
Order direct from the publisher on 0223-325970 (24 hour service).

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Introduction to Non-Commutative Noetherian Rings

K. GOODEARL and **R. WARFIELD JR**

This accessible introduction to non-commutative Noetherian rings contains much explanatory discussion and many exercises throughout the text, making it an ideal first-year graduate text or a self-contained reference.

£30.00 net Hard covers 0 521 36086 2 328 pp. 1989
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LMS Members' special prices £22.50 Hc and £8.96 Pb

Braids and Coverings

VAGN LUNDSGAARD HANSEN

This text assumes only a basic knowledge of algebraic topology. It considers classical material on the Artin braid groups, braids in the 2-sphere, braids as a tool in the study of knots and links.

£27.50 net Hard covers 0 521 38479 6 208 pp. 1989
£10.95 net Paperback 0 521 38757 4
London Mathematical Society Student Texts 18
LMS Members' special prices £20.63 Hc and £8.21 Pb

Number Theory and Dynamical Systems

M. DODSON and **J. VICKERS**

Containing current work and results on the relationship of these two areas of mathematics, this book also includes some more speculative and explanatory work which should stimulate interest in new approaches to old problems.

£15.00 net Paperback 0 521 36919 3 192 pp. 1989
London Mathematical Society Lecture Note Series 134
LMS Members' special price £11.25

Advances in Homotopy Theory

S. M. SALAMON, B. STEER and **W. A. SUTHERLAND**

This volume records the lectures given at a conference to celebrate the 60th birthday of Ioan James. It contains papers from internationally distinguished researchers which lead on from recent and exciting breakthroughs.

£15.00 net Paperback 0 521 37907 5 192 pp. 1989
London Mathematical Society Lecture Note Series 139
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MATHEMATICS FROM OXFORD

Lie Groups, Convex Cones, and Semigroups

Joachim Hilgert, Karl Heinrich Hofmann, and J. D. Lawson

The geometry of convex cones has recently come to play an important role in the development of the Lie theory of sub-semigroups of Lie groups. This book is the first comprehensive account of this new theory.

Oxford Mathematical Monographs

0 19 853569 4, 684 pp., illus., Clarendon Press, 1989 £55.00

Perfect Groups

Derek F. Holt and W. Plesken

The constructions of perfect groups are discussed from two viewpoints: classifying finite perfect groups of small order, and using perfect groups to construct infinite sequences of finite perfect factor groups.

Oxford Mathematical Monographs

0 19 853559 7, 376 pp., illus., Clarendon Press, 1989 £35.00

The Schwarz Lemma

Seán Dineen

Intrinsic metrics on manifolds provide a means to present a unified account of analysis in one, several, and infinitely many complex variables. The book develops this theme and demonstrates the utility of the approach to central problems in complex analysis.

Oxford Mathematical Monographs

0 19 853571 6, 258 pp., illus., Clarendon Press, 1989 £25.00

The Restricted Burnside Problem

Michael Vaughan-Lee

The Burnside problem, in different guises, has inspired a considerable amount of research. This treatment is intended to be self-contained and will be invaluable for postgraduate students and research workers wishing to work in this area.

London Mathematical Society Monograph Series (New Series) No. 5

0 19 853573 2, 224 pp., Clarendon Press, January 1990 £27.50

Brauer Trees of Sporadic Groups

G. Hiss and K. Lux

This volume collects together for the first time the Brauer trees of the sporadic simple groups and their covering groups, as far as they are known. It will be an invaluable reference work for all research workers whose work involves the study of finite simple groups.

0 19 853381 0, 536 pp., illus., Clarendon Press, 1989 £40.00

Discrete Mathematics

NEW EDITION

Revised Edition

Norman L. Biggs

A carefully structured, coherent, and comprehensive course of discrete mathematics. The main change in the new edition is to present numerous algorithms in a form close to that of a real programming language.

0 19 853426 4, 496 pp., illus., Clarendon Press, January 1990 £40.00
0 19 853427 2, paperback, January 1990 £17.50

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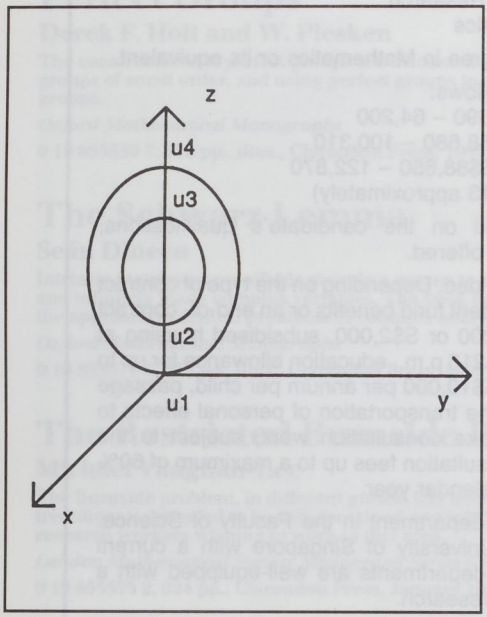
Enquiries may also be sent through BITNET to: **PERSDEPT** @ **NUSVM,** or through **Telefax: (65) 7783948**

Fundamental Texts on Mechanics

J. Mawhin, M. Willem, Institut de Mathématique Pure et Appliquée, Louvain-la-Neuve, Belgium

Critical Point Theory and Hamiltonian Systems

1989. XIV, 277 pp. 1 fig. (Applied Mathematical Sciences, Volume 74) Hardcover DM 108,-
ISBN 3-540-96908-X



Contents: Preface. - The Direct Method of the Calculus of Variations. - The Fenchel Transform and Duality. - Minimization of the Dual Action. -Minimax Theorems for Indefinite Functionals. - A Borsuk-Ulam Theorem and Index Theories. - Lusternik-Schnirelman Theory and Multiple Periodic Solutions with Fixed Energy. - Morse-Ekeland Index and Multiple Periodic Solutions with Fixed Period. - Morse Theory. - Applications of Morse Theory to Second Order Systems. - Nondegenerate Critical Manifolds. - Bibliography. - Index.

I. Ekeland, Université Paris-Dauphine, France

Convexity Methods in Hamiltonian Mechanics

1989. 4 figs. (Ergebnisse der Mathematik, 3. Folge, Band 19) Hardcover, in preparation.
ISBN 3-540-50613-6

This book describes a global variational approach in nonlinear Hamiltonian systems, including second order systems.
It has been written with the non-expert in mind. The material is arranged progressively, and the nonstandard tools - index theory and convex analysis - are explored in detail in the first two chapters. For those who are interested in *Hamiltonian systems*, it describes the powerful results on the existence and multiplicity of periodic solutions in the large which have been obtained by the variational approach. For those who would like an introduction to *nonlinear analysis*, this book shows the *interplay* between topology, geometry and functional analysis which is so prevalent in mathematics nowadays, and the fundamental role of symmetries.
Besides being an excellent source for graduate students and researchers this will also be a welcome introduction for the non-expert.

P. Lochak, Paris; **C. Meunier,** Palaiseau, France

Multiphase Averaging for Classical Systems

With Applications to Adiabatic Theorems

Translated from the French by H. S. Dumas
1988. XI, 360 pp. 60 figs. (Applied Mathematical Sciences, Volume 72) Softcover DM 78,-
ISBN 3-540-96778-8

B. Dacorogna, Lausanne, Switzerland

Direct Methods in the Calculus of Variations

1989. IX, 308 pp. 10 fig. (Applied Mathematical Sciences, Volume 78) Hardcover DM 120,-
ISBN 3-540-50491-5

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H&S 9225/5/1

Henry Frederick Baker (1866-1956), FRS, joint senior Wrangler at Cambridge 1887 and fellow of St John's 1888, was initially inspired by Klein in Göttingen to study algebraic function theory. In 1911 he turned to birational geometry, publishing his influential lectures in his 6-volume *Principles of Geometry* (1922-25). He built up the Cambridge school of geometers, not least through his Saturday afternoon 'tea parties' or seminars. An FRS in 1898, he won the Royal Society's Sylvester medal in 1910. In 1914 he was appointed by Lord Rayleigh, after some controversy, as Lowndean Professor of Astronomy and Geometry, a choice vindicated by his lectures on periodic orbits and other astronomical subjects. His last paper was published when he was 85. Awarded the Society's De Morgan medal in 1905, he was its 24th President, from 1910-1912.

DIARY

The diary lists Society meetings and other events publicised in previous issues of the Newsletter.For further information, refer to the figure in brackets, which is a cross reference to the LMS Newsletter Number.

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The Newsletter is published monthly except in August. Items and advertisements for inclusion in the Newsletter should be sent to the Editor, Susan Oakes, London Mathematical Society, Burlington House, Piccadilly, London WIV 0NL, to arrive before the first day of the month prior to publication. Telephone 01-437 5377, fax 01-439 4629, E-mail lms@uk.ac.kcl.cc.oak.

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