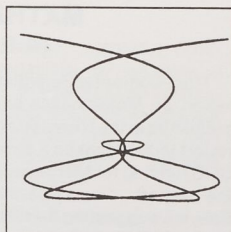


THE LONDON MATHEMATICAL SOCIETY NEWSLETTER



No. 139

April 1987

Editor: Czes Kosniowski School of Mathematics, The University, Newcastle upon Tyne, NE1 7RU. Tel: 091-232 8511 and 091-284 4209.

Advertising: Susan Oakes, LMS Office, Burlington House, Piccadilly, London W1V 0NL. Tel: 01-437 5377.

The *Newsletter* is published monthly, except in August and September. Items for inclusion (with the exception of advertising material) should be sent to the Editor, to arrive before the tenth day of the month prior to publication. Advertisements, and general enquiries about the Society, should be addressed to Susan Oakes at the LMS Office.

Forthcoming Meetings

8-9 May 1987, Edinburgh

Joint Meeting with Edinburgh Mathematical Society

(M. Christ, A.M. Davie, E.B. Davies, E.M. Stein, N.Th. Varopoulos)

Friday 19 June 1987, Burlington House

Friday 16 October 1987, Burlington House

Friday 20 November 1987, Burlington House

REVIEWS

The editors of *Mathematical Reviews* and *Zentralblatt für Mathematik* have initiated the process of revising the 1980 Mathematics Subject Classification, which is used by both journals as their classification system. The editors do not plan a radical revision of the present 1980 system, but it is clear that some changes will be needed in order to accommodate recent developments in mathematical research. It will be necessary to have this revision completed by the end of 1988 so that it can be used in *Current Mathematical Publications* beginning in 1989, and in *Mathematical Reviews* and *Zentralblatt für Mathematik* beginning in 1990.

They hereby solicit comments and

suggestions from the mathematical community to be considered in this revision process. Please write to either Robert G. Bartle, Executive Editor, *Mathematical Reviews*, 416 Fourth Street, P.O. Box 8604, Ann Arbor, MI 48107, U.S.A., or Bernd Wegner, Chefredakteur, *Zentralblatt für Mathematik*, FIZ Energie Physik Mathematik GmbH, Hardenbergplatz 2, D-1000 Berlin 12 (West), Federal Republic of Germany with your comments and suggestions. They are eager that research mathematicians and scholars have input in this revision process as soon as possible.

Copies of the present system can be found in the most recent index issues of *Mathematical Reviews* and *Zentralblatt für Mathematik*.

MATHEMATICS AND COMPUTER SCIENCE

(A Reaction To The LMS Report Dec 86)

Most Computer Scientists would welcome the report on Mathematics and Computer Science published in the Newsletter of January 1987. The report indeed makes a strong plea for increased UGC funding for Mathematics. In making its case the report draws parallels with Computer Science suggesting that Mathematics be treated similarly because Computer Science and Mathematics are inextricably linked. It is with this latter claim that many Computer Scientists would take issue. Computer Science is not 'largely based on mathematical ideas'. To suggest this is to ignore the scientific and engineering aspects of the subject. Mathematics does indeed play a major role in present-day Computer Science, and is supportive of Theoretical Computer Science, but even the latter is not considered Mathematics by practising Computer Scientists. In the early days of Computer Science, most of the breakthroughs were made by Engineers. The theoretical impact of the work by Turing, Church, Post and Von Neumann has only been felt more recently. Yes, recursive function theory, the lambda calculus and intuitionistic type theory are important for Computer Science, but they alone do not build computers!

For many years Computer Scientists in universities around the country have been trying to involve Mathematicians in their subject. Most of us have been defeated by the attempt. We have tried to persuade the Mathematicians to teach Mathematics appropriate to Computer

Science (eg mathematical logic, discrete mathematics, etc) with a singular lack of success. Our students are still given endless courses in calculus and find that they have to learn mathematical logic and discrete mathematics from Computer Scientists. A good beginning would be for Mathematicians to be prepared to revise their first year curricula to include Mathematics appropriate to Computer Science.

It does not help the Mathematicians' cause to claim that 'research by Computer Scientists (is) flawed by ignorance of the relevant Mathematics'. One could easily turn that charge around and say that much of Mathematics is flawed by its uselessness to present academic and intellectual concerns.

If a plea for special consideration is to be taken seriously on the grounds that Mathematics is important to Computer Science and Information Technology, a precondition should be that Mathematicians and Computer Scientists meet half way. To date Computer Scientists have done most of the pleading with little return to show for it. The LMS could play an important national role here by bringing together Mathematicians and Computer Scientists to explore ways of 'enriching each other.'

C J van Rijsbergen
Computing Science
Glasgow

MATHEMATICS, MECHANICS AND ASTRONOMY NEWTON (1687) LAGRANGE (1788) POINCARÉ (1889)

A conference on this theme will be held at Gonville and Caius College, Cambridge, from 17 to 20 September 1986. An international group of speakers will address questions in the history of mathematical sciences from Newton's *Principia* through Lagrange's *Mécanique analytique* to

Poincaré's work on the three body problem.

For further information, please write to the Secretary: Dr. D.C. Fletcher, Department of Mathematics, University College of Wales, Aberystwyth, Dyfed SY23 3BZ.

THEORETICAL COMPUTER SCIENCE

The third British Theoretical Computer Science Colloquium will take place at the University of Leicester, to begin on the morning of Monday 13th April, and end at lunchtime on Wednesday 15th April.

They are seeking tentative bookings for accommodation and board at Villiers Hall, Leicester University. Places for approximately 70 participants have been reserved from the night of Sunday 12 April (including an evening meal) to midday on Wednesday 15 April (including lunch). A non-returnable registration fee of £15 for each delegate is required by the end of mid-March which will contribute towards

the cost of accommodation and board. The final cost is yet to be fixed, but will be approximately £72.

At this stage, the program has yet to be finalised, but will include talks on Formal Aspects of Software Engineering, Logic, Complexity Theory, and Semantics.

They are interested in receiving offers of 45 minute (general) and 30 minute (specialist) talks; please mail your title and abstract to Derek Andrews, The Department of Computing Studies, University of Leicester, University Road, Leicester, LE1 7RH.

LMS SPITALFIELDS LECTURES

In honour of our predecessors the Spitalfields Mathematical Society, which flourished from 1717 to 1845, the LMS has instituted a new type of meeting called the LMS Spitalfields Lectures.

From time to time there are long term meetings or symposia on specialist topics at various UK universities, often supported by SERC or other funding agencies, at which there may be several eminent mathematicians from overseas. If it is appropriate and convenient the LMS may invite the organiser at such a meeting to hold a Spitalfields day, on which selected speakers

would be invited to give survey lectures or other types of lecture accessible to a general mathematical audience, to which LMS members will be invited. The meeting would be advertised in the Newsletter beforehand. The LMS may provide a modest contribution towards administrative costs.

The first Spitalfields Lectures will be organised by Professor D. Evans on Operator Algebras at the University of Warwick on Friday, 5th June. Further details will be given in a later Newsletter.

MANIFOLDS AT EDINBURGH

A meeting on the Algebraic Topology of Manifolds will be held at the Department of Mathematics, Edinburgh University on Thursday, 28th May and Friday, 29th May, 1987. The meeting is jointly sponsored by Edinburgh University, Edinburgh Mathematical Society and the Royal Society of Edinburgh. The speakers will

include T. Goodwillie (Harvard), F. Johnson (London), E. Pedersen (Odense), F. Quinn (Virginia Tech), P. Scott (Liverpool) and F. Waldhausen (Bielefeld). For further information write to Manifolds Conference, Dr. A.A. Ranicki, Dept. of Mathematics, Edinburgh University, Edinburgh EH9 3JZ.

RESEARCH AND TRAVEL GRANTS

At the moment the Society is compiling a list of sources of research and travel grants available to mathematicians residing within, or wishing to visit, the United Kingdom. It is hoped that this information, when collected, will form the basis of an irregular publication, available to members of

the L.M.S. and all U.K. mathematics departments. If anyone has any useful information will they please send the relevant details to Dr. J.W. Bruce, Department of Pure Mathematics, The University, Newcastle upon Tyne, NE1 7RU.

NORTH BRITISH FUNCTIONAL ANALYSIS SEMINAR

Professor Catherine Olsen (SUNY at Buffalo), will talk on *Symmetrizable operators: an application to engineering* and *A triangular form for linear operators* at 14.30 in Lecture Theatre 3 and 16.30 in Room 6 on Monday 27 April 1987

within Appleton Tower, George Square, Edinburgh. Tea will be served at 15.30. Further details are available from N. J. Young, Secretary to the Seminar.

GROUPS IN GALWAY

A weekend group theory conference will be held in Galway, Ireland on 15th and 16th May

1987. Further information may be obtained from R.S. Dark, University College, Galway, Ireland.

ONE-DAY COMBINATORICS COLLOQUIUM

A one-day Combinatorics Colloquium, supported by the British Combinatorial Committee, will take place at the University of Reading on Wednesday 29 April 1987. The following have agreed to speak: R.A. Bailey, N.L. Biggs, S.A. Choudum, J. Dénes, R. Diestel, J.W. Essam, A.D. Gardiner, J.D. Key, M. Lewin, D.H.

Smith, R. Thomas. Lectures will start at about 10.15 a.m. Further details may be obtained from Professor C.St.J.A. Nash-Williams, Department of Mathematics, University of Reading, Whiteknights, P.O. Box 220, Reading, Berkshire RG6 2AX, telephone (0734) 875123 ext 429.

HISTORY OF MATHEMATICS

The next meeting of the British Society for the History of Mathematics will take place at the Open University London Regional Centre, 526 Finchley Road, London NW3 (nearest tube station, Finchley Road) on Friday 12th June 1987. The meeting will start at 1100 and end at 1600. This will be a joint meeting with the Open University. Participants will be able to see and

discuss the audio-visual material for the new Open University course on the history of mathematics (MA290, Topics in the history of mathematics).

Further information may be obtained from Dr C.R. Fletcher, Department of Mathematics, The University College of Wales, Aberystwyth, Dyfed.



Algorithms and Combinatorics

Editors: R. L. Graham,
B. Korte, L. Lovász

New series!

Combinatorial mathematics has substantially influenced recent trends and developments in the theory of algorithms and its applications. Conversely, research on algorithms and their complexity has established new perspectives in discrete mathematics. This new series is devoted to the mathematics of these rapidly growing fields with special emphasis on their mutual interactions.

The series will cover areas in pure and applied mathematics as well as computer science, including: combinatorial and discrete optimization, polyhedral combinatorics, graph theory and its algorithmic aspects, network flows, matroids and their applications, algorithms in number theory, group theory etc., coding theory, algorithmic complexity of combinatorial methods in computer science and related areas.

The main body of this series will be monographs ranging in level from first-year graduate up to advanced state-of-the-art research. The books will be conventionally type-set and bound in hard covers. In new and rapidly growing areas, collections of carefully edited monographic articles are also appropriate for this series. Occasionally there will also be "lecture-notes-type" volumes within the series, published as *Study and Research Texts* in soft cover and camera-ready form. This will be mainly an outlet for seminar notes, drafts of textbooks with essential novelty in their presentation, and preliminary drafts of monographs.

Prospective readers of the series **Algorithms and Combinatorics** include scientists and graduate students working in discrete mathematics, operations research and computer science.

Forthcoming titles:

Vol. 1 K. H. Borgwardt, **The Simplex Method**

in preparation:

Vol. 2 M. Grötschel, L. Lovász, A. Schrijver, **Geometric Algorithms**

Vol. 3 K. Murota, **Structural Solvability and Controllability of Systems**

Vol. 4 B. Korte, L. Lovász, R. Schrader, **Greedoids**

Vol. 5 J. Nešetřil, V. Rödl (eds.), **Mathematics of Ramsey Theory**

Vol. 6 A. Recski, **Matroid Theory and its Applications**

Algorithms and Combinatorics 1

K. H. Borgwardt, University of
Augsburg, Germany

The Simplex Method

A Probabilistic Analysis

1987. 42 figures in 115 separate illustrations. XI, 268 pages. Soft cover
£ 26.50, ISBN 3-540-17096-0

Contents: Introduction. – The Shadow-Vertex Algorithms. – The Average Number of Pivot Steps. – The Polyno-

miality of the Expected Number of Steps. – Asymptotic Results. – Problems with Nonnegativity Constraints. – Appendix. – References. – Subject Index.

This book is a summary and extension of the prize winning research of the author (Lanchester Prize 1982) on linear programming. Among the main topics are: Why is the Simplex Method so efficient?

How can the large gap between worst-case and empirically observed performance of the Simplex Method be explained?

The author was the first to answer these questions that remained challenging

open problems for more than thirty years. His results were obtained by analyzing the Simplex Method from a probabilistic point of view.

In this book the author first gives a historical survey of the research on the complexity of the Simplex Method. Then a new geometrical interpretation of the Simplex Method is given, which allows the application of methods from stochastic geometry. These lead to the most important results, such as proofs of polynomiality and proofs of sharp asymptotic bounds for the expected number of pivot steps. The detailed explanation of the material makes the text accessible to all mathematicians and interested scientists.

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CA, USA

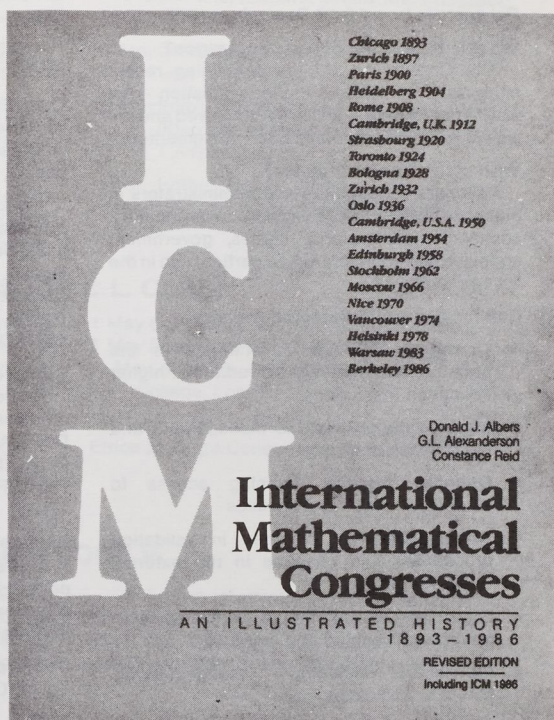
International Mathematical Congresses

An Illustrated History 1893-1986

Including ICM 1986

Revised edition. 1987. 129 figures.
V, 64 pages. Hard cover £ 29.00
ISBN 3-540-96479-7

This edition of "International Congresses of Mathematics" contains an account of the ICM 1986 in Berkeley, with profiles of the field medalists and the Nevalinna prize winners. The illustrated history of the ICM provides the reader with a widely and richly illustrated account of the development of mathematics over the last one hundred years. Although not technical in nature, the book gives an idea of the growth of mathematics, its changing role in society, and of the steady development of mathematics in its relationship to the natural and social sciences.



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RESTRUCTURING HIGHER EDUCATION

The Society for Research into higher education is holding a conference on Restructuring Higher Education at Birmingham Polytechnic from 16-18 December, 1987.

What is the theme of the Conference?

The Conference will be examining recent changes in policies in higher education - the ways in which new policies have evolved and the extent to which they have been implemented.

Who is the Conference for?

Teachers, researchers and administrators in higher education. Representatives from industry, commerce, professional bodies, government agencies and other interested parties both in the UK and overseas.

Call for Papers: Suggested themes

- **Changing the Ethos:** changes in the structure and cultural involvement of higher education institutions
- **Management Practice:** management and the process of change
- **Opening Access:** opening access to courses, services and facilities
- **Quality Control:** changes in validation procedures and changes in the external examiner system
- **Staff Performance:** staff performance in relation to teaching and research
- **Mergers:** including amalgamations, takeover and closure
- **Diversification and Marketing:** including the institution's courses, services and facilities
- **Professional Bodies:** what should they control?

Speakers

Speakers already booked include Mr

Christopher Ball, Chairman of the National Advisory Body for Public Sector Higher Education and Sir Peter Swinnerton-Dyer, Chairman of the University Grants Committee.

The Secretary of State for Education has also been invited to speak.

Contributions to the Conference are welcomed

These should take the form of research papers, workshops, seminars or case studies.

If you wish to make a contribution an outline proposal of 200-300 words including an indication of the area of relevance, proposed length, manner of presentation and use of supportive media should be sent to Ms Heather Eggins, CNAA, 344-354 Grays Inn Road, LONDON WC1Y 8BP, no later than 6 May 1987.

Conference Exhibition

Participants, publishers and other commercial organisations wishing to exhibit should contact Derek Allen, Enterprise Unit, City of Birmingham Polytechnic, Perry Barr, Birmingham B42 2SU, Tel. 021-256 9193 Ext. 291 no later than 6 May, 1987.

Publications

Conference Proceedings will be published - editor Heather Eggins. They will be sent to all participants and the cost will be included in the Conference fee.

Conference Venue

The Conference will take place at Paradise Circus, a new multi-million pound Arts, Conference and Exhibition Centre linking Birmingham Polytechnic School of Music with the Central Library, a unique complex in the cultural heart of the City. Birmingham has excellent rail, road and air connections to all parts of the UK.

We wish to purchase runs and odd Nos. of: Sphinx, Revue Mensuelle des Questions Recreatives, Bruxelles, 1931-39, Journal of Recreational Mathematics, 1968 - Recreational Mathematics Magazine, 1961-64, Sphinx-Oedipe, Nancy, 1906-1932. Mathematical Pie, 1950 - All books published in the series "Librairie du Sphinx" Bruxelles, Rouse-Ball, W.W. "Mathematical Recreations and Essays" all editions from the first (1891) to 11th (1939). Also mathematical books of all kinds from very elementary to advanced texts. Also biographies of mathematicians and physicists. We also sell books in this field, indeed, we specialise in mathematics and will be pleased to receive your list of books wanted and to send you our current catalogue sent post free on request.

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PROFESSOR E.A. MICHAEL

Professor Ernest Michael of the University of Washington in Seattle (currently in Munich) is on an LMS Scheme-2 tour. He is currently scheduled to speak, under the title *Some recent results on continuous selections*, in the following venues:

- 6 May London Topology Seminar (Birkbeck College) (Confirm details with Dr E H Kronheimer)
- 8 May University College of North Wales, Bangor (2.30 p.m. Room 808) (Confirm details with Professor R Brown)

11 May Oxford Topology Seminar (Mathematical Institute) (Confirm details with Professor I M James)

13 May University of Sheffield (Confirm details with Dr R J Cook)

15 May Edinburgh Functional Analysis Seminar (King's Buildings) (Confirm details with Dr T A Gillseppe)

For further details please contact Erwin Kronheimer of Birkbeck College, London.

PROFESSOR C.L. OLSEN

Professor C.L. Olsen (SUNY, Buffalo) currently on sabbatical at Copenhagen University will visit the U.K. in April/May. She is to be financially supported by the L.M.S. who is providing a travel grant.

The lectures arranged are as follows:

- 27 April North British Functional Analysis Seminar at Edinburgh.

1 May Colloquium at Trinity College, Dublin.

5 May Functional Analysis Seminar at Oxford.

7 May Modern Analysis Seminar at King's College, London.

Further details may be obtained from John Erdos at King's College, London.

NASECODE V

NASECODE V, The Fifth International Conference on the Numerical Analysis of Semiconductor Devices and Integrated Circuits will be held in Trinity College, Dublin, Ireland from 17-19 June 1987.

For further information contact: Conference Management Services, PO Box 5, 51 Sandycove Road, Dun Laoghaire, Co Dublin, Ireland. Tel: (+353-1) 452081 (or 808025 if no reply).

SERC ENQUIRY POINTS

Except where otherwise stated, all extension numbers are at SERC Central Office, telephone Swindon (0793) 26222.

Engineering

Fluid mechanics and thermodynamics J W Reed ext 2478

Applied mechanics Miss P A Rogers ext 2117

Joint ESRC-SERC; studentships & fellowships Miss M Wilson ext 2427

Science

Computing A P Brown ext 2217

Mathematics F Hemmings ext 2312

Physics J. Farrow ext 2261

Cooperative grants (Science) Mrs V Nowlan ext 2412

Finance

Account queries T A Treglown ext 2434

Research Grants

Terms and conditions; supply of forms ext 2405

Studentships

Advanced course studentships ext 2414

Research studentships ext 2316

Studentships tenable abroad, including NATO ext 2137

CASE and general enquiries ext 2138

Fellowships

Postdoctoral (home, overseas and NATO), advanced and senior fellowships ext 2172

Royal Society/SERC ext 2352

Industrial Fellowships

Anglo-Australian Fellowships:

J M Liptrott, Royal Observatory, Edinburgh 031-667 3321 ext 249

Visiting fellowships on grants: Enquiries should be made to the appropriate subject committee.

SIR MICHAEL ATIYAH, F.R.S.



Sir Michael Atiyah has been chosen as a winner of the King Faisal International Prize for Science, which was offered for 1987 in the field of mathematics. The prize has been awarded to Sir Michael in recognition of his outstanding contributions to mathematics, especially in research, the promotion of mathematical education and international collaboration among mathematicians.

NATO PROGRAMMES

The Advanced Study Institutes and Advanced Research Workshops to be held in 1987 are given below.

Participation or tuition fees are not usually requested from participants, some of whom may obtain small grants from the meeting director to assist with travel and living expenses. Each meeting is held under the responsibility of its director, to whom all requests for information, attendance or support should be addressed.

Advanced Study Institutes

Advanced Study Institutes are tutorial courses of two weeks' duration on new important topics for up to 100 scientists and research students. They aim at the dissemination of advanced scientific knowledge and the promotion of international contacts among scientists.

Incomplete Information and Bounded Rationality Decision Models

Dr. HW KHUN, Dept of Mathematics, Princeton Univ., Princeton. NJ 08544, USA 3 - 13 June 1987: Varenna, Italy.

Mathematical Models for Decision Support

Dr. G MITRA, Dept of Maths & Statistics, Brunel Univ., Uxbridge, Middx. UB8 3PH, UK 26 July - 6 August: Val d'Isère, France

Algorithms and Order

Dr. I RIVAL, Dept of Maths, The University, 2500 University Drive N.W., Calgary, Alberta T2N 1N4, Canada 9 - 22 May 1987: Ottawa, Canada

Mathematical and Statistical Developments of Evolutionary Theory

Prof. A DAIGNEAULT, Dép de Maths, Univ. de Montréal C.P. 6128, Succ A, Montréal P.Q. H3C 3J7 Canada 3 - 21 August 1987: Montréal, Canada

Advanced Research Workshops

Advanced Research Workshops are working meetings which enable scientists and engineers to review the state-of-the-art in specific topics in fast moving fields and to formulate recommendations for the future. They are of about five days' duration.

Perspectives in Ring Theory

Prof. F VAN OYSTAEYEN, Dept. of Mathematics, UIA, Universiteitsplein 1, 2610 Wilrijk, Belgium, 20 - 28 July 1987: Antwerp, Belgium

The Interaction between Algorithms and Problem Formulations in Mathematical Programming

Dr SW WALLACE Chr. Michelsen Inst, 5036 Fantoft, Bergen, Norway, 15 - 19 June 1987: Bergen, Norway

Cycles and Rays - Basic Structures in Finite and Infinite Graphs

Prof. G SABIDUSSI, Centre de Rech, Math, Univ de Montréal C.P. 6128, Succ A Montréal Québec, Canada 3 - 9 May 1987: Montréal, Canada