THE LONDON MATHEMATICAL SOCIETY NEWSLETTER

No. 189 **December 1991**

FORTHCOMING SOCIETY MEETINGS

Friday 17 January 1992, Burlington House
J.R. Blake, S.J. Hogan
Friday 21 February 1992, Bristol
R.E. Borcherds, S. Donkin
Friday 20 March 1992, Burlington House
R.A. Bailey, L.C.G. Rogers
Friday 15 May 1992, Burlington House
A.J. Scholl, M.J. Taylor
Friday 19 June 1992, Burlington House
W.B.R. Lickorish, V.G. Turaev
Monday 29 June - Wednesday 1 July 1992
Joint meeting of AMS and LMS, Cambridge
Friday 16 October, 1992, Burlington House
Friday 20 November 1992, Burlington House

1991 COUNCIL ELECTIONS

At the Annual General Meeting on 15th November 1991, the following members were elected to Council: J.F.C. Kingman (President); J.M. Howie and P.M. Neumann (Vice-Presidents); J.D.M. Wright (Treasurer); R.Y. Sharp (Council and General Secretary); A.R. Pears (Meetings and Membership Secretary); D.A. Brannan (Publications Secretary); J.A. Erdos (Librarian); R.A. Bailey, N.J. Hitchin, N.J. Young (Members-at-Large, 2-year terms); D.J. Collins, S.K. Donaldson, W.A. Hodges, J.R. Ringrose, R.L.E. Schwarzenberger, (Members-at-Large, 1-year terms). D.G. Crighton, E.C. Lance, H.R. Morton and M.J. Taylor are Members-at-Large whose terms expire in 1992.

R.Y. Sharp
Council and General Secretary

1992 INVITED LECTURES

The next meeting in the LMS Invited Lectures series will be held at the University of Bath, with Professor Peter J. Olver of the University of Minnesota speaking on the topic *Symmetry and Equivalence of Differential Equations*. Professor Olver will deliver about ten hours of lectures from Monday 13th to Thursday 16th April 1992, beginning at a level accessible to postgraduate students, and will write up his lecture notes for publication by the Society as a book.

The 1992 SERC Nonlinear Systems Spring School will be organised around Professor Olver's lectures at Bath, supplementing them with a further ten hours of introductory lectures for postgraduates on various topics in nonlinear mathematics. SERC support for this meeting will be available to a substantial number of students holding SERC studentships.

Accommodation will be available at the University for the Monday, Tuesday and Wednesday nights.

Those wishing to attend, or wishing to nominate their postgraduate students (whether or not they hold SERC studentships), may obtain full details from Dr G.R. Burton, School of Mathematical Sciences, University of Bath, Claverton Down, Bath BA2 7AY (0225 826218, grb@uk.ac.bath.maths).

GEORGE GREEN TO BE COMMEMORATED IN WESTMINSTER ABBEY

The Dean of Westminster has accepted a proposal to place a memorial slab to George Green in the Abbey. It is planned that this should be unveiled in July 1993 at the time of the bicentenary of his birth.

George Green (1793-1841) was a pioneer in the application of mathematics to physical problems. He was a miller who lived in Nottingham nearly all his life and had very little formal education until he had completed most of his best work. Then, at the age of 40, he went to Caius College, Cambridge, to read for a degree in Mathematics and became a Fellow of his college. Partly as a result of his unusual circumstances he received little public recognition in his lifetime, and it was William Thomson (Lord Kelvin) who first recognised the value of his work and gave it wide publicity. His work has had great influence and nowadays he is remembered principally for Green's theorem in vector analysis, Green's tensor (or the Cauchy-Green tensor) in elasticity theory and above all for Green's functions for solving differential equations. The Green's function technique has been very widely applied to equations arising in classical physics and engineering and in recent years has been adapted to quantum mechanical problems in areas as diverse as nuclear physics, quantum electrodynamics and superconductivity.

The proposal to commemorate him in the Abbey was made by Professor L.J. Challis, Professor A.J.M. Spencer, Professor K.W.H. Stevens and Dr F.W. Sheard of Nottingham University with the strong support of the President of the Royal Society, Sir Michael Atiyah, Professor Sir Sam Edwards, Cambridge University, Professor Sir Roger Elliott, Oxford University, and Sir James Lighthill, former Provost of University College, London.

In the Abbey, Green's name will join those of other leading 19th century scientists - Faraday, Joule, Kelvin, Maxwell and Stokes.

For further information contact Professor L.J. Challis, Physics Department, University of Nottingham, Nottingham NG7 2RD, tel: 0602 484848 ext 2808, fax: 0602 229792.

LMS DURHAM SYMPOSIA 1992

There will be three Symposia in 1992:

4th July - 14th July

Evolutionary Problems: Continuous and Discretized Nonlinear Systems

Organisers: Professor C.T.H. Baker*, Professor C. Elliot, Dr D.F. Griffiths, Dr A. Iserles, Dr R. Thomas.

Invited Participants to Include: F. Brezzi, J.C. Butcher, A. Feldstein, J. Hale, H.B. Keller, J.M. Sanz-Serna, R. Temam, L.N. Trefethen.

14th July - 24th July

Non-Commutative Rings - New Directions

Organisers: Dr T.H. Lenagan*, Professor K.A. Brown.

Main Speakers: M. Artin, K.A. Goodearl, A. Joseph, T. Levasseur, Yu.I. Manin, S.P. Smith, J.T. Stafford.

21st July - 31st July

The Geometry of Operator Algebras and Banach Spaces

Organisers: Professor A.M. Sinclair*, Dr T.K. Carne, Professor S.C. Power.

Main Speakers: W. Arveson, J. Bourgain, D. Burkholder, U. Haagerup, P. Jones, A. Pelczynksi, G. Pisier.

These research symposia are organised under the auspices of the LMS and are supported by Research Grants from SERC. There may be a few places available for mathematicians not yet invited. Those interested should write for more information to the organisers marked * at the following addresses:

Professor C.T.H. Baker, Department of Mathematics, University of Manchester, Oxford Road, Manchester M13 9PL.

Dr T.H. Lenagan, Department of Mathematics, University of Edinburgh, Mayfield Road, Edinburgh EH9 3JZ.

Professor A.M. Sinclair, Department of Mathematics, University of Edinburgh, Mayfield Road, Edinburgh EH9 3JZ.

HOMOTOPY THEORY CONFERENCE

A conference on Homotopy Theory will be held in Sorrento, Italy from 22nd to 27th June 1992. For further information contact Professor R. Piccinini, Dipartimento di Matematica, Universita di Milano, Via C. Saldini 50, 20133 Milano, Italy.

CHRISTOPHER THOMPSON

Dr Christopher Lancelot Thompson who was elected a member of the London Mathematical Society on 18th October 1973 died on 12th October 1991 at the age of 50. He was educated at Trinity College, Dublin and at Churchill College, Cambridge where he was a student of Dame Mary Cartwright. Since 1966 he was a lecturer in Mathematics at the University of Southampton. His recent work was in non-standard analysis and dynamical systems.

LONDON MATHEMATICAL SOCIETY

NOTICE OF GENERAL MEETING

There will be a General Meeting of the Society on Friday 17th January 1992 at 3.30 p.m. in the Meeting Room of the Geological Society, Burlington House, Piccadilly, London W1V 0NL, to consider a proposal by the Council of the Society to introduce a new By-Law II,4.

The Council is following legal advice in this matter. The effect of the new By-Law II,4, if accepted, would be to consolidate into the By-Laws Council's current practice of not charging a newly-elected Ordinary Member an entrance fee.

Text of the proposed By-Law II,4

No entrance fee shall be payable by a newly-elected Ordinary Member.

R.Y. Sharp
Council and General Secretary

PARTNERSHIP AWARDS 1991

This was the first year in which the Partnership Awards for Innovation in Higher Education included a Prize for Mathematics. It was sponsored by British Nuclear Fuels. Fifteen entries were received and it is hoped that this number will grow from year to year. The assessors recommended that the Prize for 1991 be awarded to Alan Davies and Rosalind Crouch of the School of Information Sciences, Hatfield Polytechic for the compulsory module **Mathematical Modelling & Communication Skills** in the BSc Mathematics course. The module had a number of innovative features. a) Its teaching is shared by two permanent academic staff at the School, one a professional applied mathematician and one a professional in communication skills; the integration achieved between the two areas was impressive and made each more effective than if they had been addressed separately. b)It combines an emphasis on general principles of mathematical modelling with use of very elementry mathematical techniques and plays an important role in building up the mathematical confidence of students at the beginning of their course; there was clear evidence that the subsequent modules on mathematical modelling and the (optional) industrial placement year benefited. The assessors commented:

Although the mathematical level of the module is elementary it clearly meets the criteria for the Award. It is an example which could fruitfully be copied elsewhere; it has an influence on a relatively large number of students; it does convey some of the excitement and utility of mathematics; and finally its emphasis on reporting, presentation and understanding places school teaching high on the list of possible future careers for the students.

The entry from Chris Ricketts and Jim Shalliker of the Department of Mathematics & Statistics, Polytechnic South West, Plymouth was recommended for commendation. It described a third year optional module in the BSc Mathematical Studies which included solving a problem for a real client. In the case of the course the client visited was an international shipping company and the problem concerned the efficient stowage of a large number of reels of thin cardboard with greatly varying heights.

The overall standard of entries was high and there is no reason why those who were unsuccessful in 1991 should not re-enter in 1992. It is also hoped that more innovative courses in Universities will be represented. Details of the Awards are circulated through Vice-Chancellors, Principals and Directors but can also be obtained from Partnership Awards, Royal Society of Arts, 8 John Adam Street, London WC2N 6EZ.

R.L.E. Schwarzenberger

CATEGORIES AND COMPUTER SCIENCE

Recently the LMS assisted with the organisation of a research symposium at Durham, funded by the SERC, on "Applications of categories in computer science". The scientific side of this well attended symposium was organized by Michael Fourman, Peter Johnstone and Andrew Pitts. Selected papers will appear in a volume in the LMS lecture notes series, published by C.U.P. The following is an edited extract from Dr Pitts' report to the LMS and SERC: we are grateful for him for permission to publish it here.

One way of becoming more confident of a program's correctness is to give a formal proof that it has some required property but first one must have a rigorous definition of the meaning of the programming language involved. Three techniques are commonly employed to do this: "operational" semantics (indirectly assigning meanings to language expressions via rules for evaluating complete programs), "denotational" semantics (which directly assigns meanings to all language expressions as elements of some appropriate mathematical structure) and "axiomatic" semantics (indirectly assigning meanings to all language expressions by defining a logic of properties of these expressions).

The three approaches are interconnected. For example, an operational semantics gives rise to a notion of equality between language expressions: two expressions can be considered operationally equal if they can be freely interchanged in all complete programs without affecting the results of evaluation. On the other hand, a denotational semantics gives rise directly to a notion of equality of language expressions via equality of their denotations. Ideally, one would like operational and denotational equality to coincide, since the former is most easily related to actual language implementations whereas the latter is easier to work with in proofs. This ideal has proved hard to achieve for various combinations of high-level language features. Typically denotational equality implies operational equality, but not vice versa, in which case one says that the denotational semantics fails to be "fully abstract" with respect to the operational semantics.

The best example of such a mismatch occurs in the work of Milner and Plotkin on the language PCF of recursively defined functions of higher type equipped with a sequential operational semantics and Scott's denotational semantics using complete partial orders. Many attempts have been made to find a denotational model which is fully abstract for the sequential functions of higher type, but the problem remains open. An excellent survey of this work was given by Curien. Up to now, one of the best attempts was the Berry-Curien cartesian closed category of "stable concrete data structures and sequential algorithms". Curien described new work of Cartwright-Felleisen refining this category to one which is fully abstract for a very natural extension of PCF involving exception handling. His talk was complemented by one from Seiber who showed how standard techniques involving "logical relations" could be adapted not only to produce elegant proofs of known properties of sequential functions, but also to cut down Scotts's model of PCF to one which is fully abstract at least for functions of order 2 3.

Category theory has been used extensively in developing the mathematical structures needed for denotational semantics of programming language features. A discussion session chaired by Tennent reviewed various means of giving denotational semantics of local variables in languages such as ALGOL and ML. During this session and in further discussions, an attempt was made to compare and reconcile the functor category techniques of Reynolds-Oles-Tennent-O'Hearn with recent work of Moggi using particular monads. This latter work is part of an ambitious program on Moggi's part to systematise and simplify the whole subject of denotational semantics through the use of the categorical notion of a (strong) monad. Moggi's approach was touched upon in his contribution to the formal scientific programme and also in a lively evening session chaired by Harold Simmons on the pros and cons of modelling computation using monads, or using the dual concept of comonad (as Brookes had described in a previous talk), or using neither concept.

Two other categorical approaches to denotational semantics were presented at the symposium. The first, now called "axiomatic domain theory", seeks to axiomatise the properties of a category sufficient for its objects and morphisms to be used to give denotational semantics for standard programming language features. Freyd introduced the powerful new concept of "algebraically compact" category and demonstrated that a rich and well behaved theory of recursively defined domains and functions can be developed from it. Smyth stressed a particular instance of Freyd's concept, in the context of categories of information systems. The second approach, termed "synthetic domain theory", follows suggestions of Scott to use constructive logic to allow simplifying assumptions about computations which are not possible in classical logic. In this approach, described by Hyland, computational domains simply become special kinds of sets in a suitable topos and all functions between them are computable. During the symposium, work was begun on relating the different kinds of category required for these "axiomatic" and "synthetic" versions of domain theory.

Another topic discussed at the symposium is the use of types in programming languages. The insistence that expressions be typeable is held by some to be a good way of eliminating cer-

tain kinds of error from programs and by others to be an annoying restriction. To counteract the second reaction, type systems have grown richer and more expressive in a number of ways, such as through the use of subtyping relations. In these rich systems there may be several different ways to derive the type of any given expression: one has to verify that the meaning of the expression is independent of which derivation is used. Categorical versions of such "coherence" problems have been quite intensively studied: Curien, Reynolds and Rydeheard showed their application to type systems of interest in computer science.

One approach to the development of type systems has been the "propositions-as-types" paradigm, based on proof theory and certain constructive logics. Category theory contributed another viewpoint, whereby the particular logic or type theory can be seen as a certain kind of structured category. Reynolds showed how to use this categorical viewpoint to derive elegant proofs of properties of parametricity in the Girard-Reynolds polymorphic lambda calculus, and Wadler presented some related work.

Work on concurrency and parallel computation was also presented. This rapidly developing field has many more computational models than there are foundational principles for elucidating the subtle assumptions about the nature of parallelism and non-determinism built in to the different approaches. Category theory has certainly contributed to this unfortunate position: but Winskel demonstrated that it can also be used to organise and compare the many existing models. Another very interesting development in this area is the emergence of type systems for concurrent computation based upon Girard's Linear Logic: Abramsky presented a promising term calculus for proofs in Girard's classical linear logic and demonstrated its relationship to existing process calculi.

Computer science has a schizophrenic nature: it is both a mathematical and an engineering discipline. The mathematical aspects of the subject were very much to the fore in the topics described above. However, there were also contributions to the symposium (e.g. by Gunter, Sannella and Johnson) which represented applications of category theory to the engineering aspects of the subject, to do with methods for the design and maintenance of large systems. Such applications stem from the fact that category theory provides very general and uniform means for putting together mathematical structures of a particular kind (category).

LMS Computer Science Committee.

SÉMINAIRE DE MATHÉMATIQUES SUPÉRIEURES NATO ADVANCED STUDY INSTITUTE

A Seminar on "Bifurcations and Periodic Orbits of Vector Fields" will be held at the Université de Montréal from 13th - 24th July, 1992. The Seminar is held with the support of NATO, the Natural Sciences and Engineering Research Council of Canada, and the Université de Montréal.

The principal speakers are C. Camacho (IMPA Rio de Janeiro), F. Dumortier (Limburg), J. Ecalle (Orsay), J. Guckenheimer (Cornell), P.J. Holmes (Cornell), Y. Il'Yashenko (Moscow State), N.G. Lloyd (Aberystwyth), R. Moussu (Dijon), J.-P. Ramis (Strasbourg), R. Roussarie (Dijon), C. Rousseau (Montréal), D. Schlomiuk (Montréal) .

Partial financial assistance will be available. Priority will be given to graduate students. Requests for participation or financial assistance must be received before 6th March 1992. Further information is available from G. David, Secretary, Department of Mathematics and Statistics, Université de Montréal, C.P. 6128-A, Montréal, Qué., Canada H3C 3J7. Fax (514) 343-5700.

INTERNATIONAL ONLINE/CD-ROM MEETING

The American Mathematical Society is again exhibiting at the International Online/CD-ROM Meeting 10th to 12th December, at the Olympia 2, London. The exhibits are open Tuesday from 11.00 to 18.00; Wednesday from 09.30 to 18.00; and Thursday from 10.30 to 16.00. Tickets for the exhibit can be obtained from the LMS office.

The AMS will show MathSci Disc (MR 1980-91 and CMP on CD-ROM) and will give a preview of the MR Index 1940-79 on CD-ROM. Other exhibitors include hundreds of publishers, database producers, online hosts, CD-ROM developers, and other information-related companies from various countries. Approximately 5,000 attendees are expected to attend this major international meeting.

COMBINATORIAL MATHEMATICS AND COMBINATORIAL COMPUTING CONFERENCE

The 19th Australasian Conference on Combinatorial Mathematics and Combinatorial Computing will be held at the University of Adelaide, from 12th to 16th July 1993. For further information contact Dr C.M. O'Keefe, Department of Pure Mathematics, University of Adelaide, GPO Box 498, Adelaide, SA 5001, e-mail: cokeefe@spam.ua.oz.au.

A MATHEMATICAL ENTERPRISE DAY

Most Universities and Polytechnics have an "Enterprise Office" run by the E.H.E. (Enterprise in Higher Education). Mathematical activities that have been funded by E.H.E. include Computer Aided Learning of Mathematics, (C.A.L.M.), and various attempts to develop more student centred learning, (projects, "Mathematics in Context" or "Mathematics in Society" type courses, problem solving courses, etc). I was recently involved in a somewhat different EHE funded activity at Bangor, and our experience may be of use or interest to other departments.

We are still at a relatively early stage of finding ways to use EHE constructively, not only for funding to improve teaching, prepare materials, etc, but in the expertise that is there in the EHE team members. We decided to try and involve as many members of the School as possible in an EHE funded "day-away", to discuss curriculum development, reactions to proposals for 3/4 year degrees and generally to allow time for an overview of our Mathematics degrees. The EHE not only provided funding but also coordinated the day. We suggested the general structure for the day and the EHE team provided expertise in task analysis and an external view of potential innovations. The reason for holding the day away from Bangor was to break the mould of our usual Board of Studies meetings and to avoid the "same scenery" leading to the same reactions to problems.

The initial session was on the LMS discussion document on 3/4 year degrees. This also served as a testing ground for some principles of Task Analysis, (introduced and coordinated by one of the EHE team) to see if by structuring the task of preparing a response to the discussion document, we could come to some interim conclusions quite quickly. We in fact failed in this but learnt quite a lot from our failure. (It is very salutary to be on the receiving end of a teaching/training process!) After coffee, we looked at the question *"What is a Mathematics degree?"* We had noted that whilst institutions that have to face validation at regular intervals are forced to present reasons for the content and structure of a degree course, university departments by reason of their independence, can end up not reviewing the **overall** aims of degree courses. In other words: *"Why are we teaching what we are teaching","Why are we teaching it in the way we are teaching it?"* and so on. Information from the LMS Education Committee Survey on Innovation in Mathematics Courses came in useful here. Again we treated this as a task analysis exercise, we split into two groups and "brain stormed" possible answers to the two questions (i) what qualities / skills does one hope for in a mathematics graduate, and (ii) what possible innovations could be used (However unusual!)?

After lunch, we spent some time problem solving, analysing and performing a task (building as high a Lego tower as possible using as few bricks as possible, but with a given minimum height in a given extremely limited time for planning and for building). This was very enjoyable. Several people commented on the relevance of this apparently useless exercise to how we might attack the problem of teaching students to formulate, analyse and solve *mathematical* problems. This "game" finished, we met to discuss the detailed ideas for how best to spend the money made available to us by EHE. Our ideas included buying staff time for the preparation of material for computing courses, expenses for visiting speakers for our History of Mathematics and Mathematics in Context courses and purchase of software for teaching purposes (C.A.L.M., Computer Algebra based systems, etc). The day finished in the late afternoon.

The general reaction was favourable even from people who initially had been sceptical. It is important to note that we could not have run such a successful day without the input from the EHE team. Perhaps we also developed some sense of working together in a team towards some partial solutions to the new problems facing us with expansion of class size, more computational work and moves towards more student centred learning. I can say that I enjoyed it a lot, and would certainly suggest that other groups experiment in similar ways.

T. Porter

BRITISH SOCIETY FOR THE HISTORY OF MATHEMATICS

The Christmas Meeting and Annual General Meeting of the British Society for the History of Mathematics will be held on Thursday 19th December 1991 at Birkbeck College, Malet Street, London. The programme is as follows: 10.30 - 11.00 coffee; 11.00 - 11.45 The story of the discovery of incommensurability, revisted - David Fowler (Warwick); 11.50 - 12.35 On hearts and ivy leaves, or, What the ancients did with curves - Wilbur R. Knorr (Stanford); 12.45 - 1.45 lunch; 2.00 - 2.45 The foundations of dynamics since the end of the sixteenth century - Gerald J. Whitrow (Imperial College); 2.50 - 4.00 Annual General Meeting; 4.00 - 4.30 Tea.

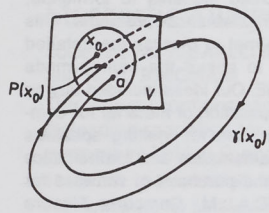
If you wish to attend, advise Dr J.K. Dugdale, Department of Mathematics, University of Reading, PO Box 220, Reading RG6 2AX as soon as possible, and not later than Thursday 5th December if you wish to order lunch. Enclose either £3 being the registration fee (including tea and coffee, but not lunch) or £13.50 registration fee (including, tea, coffee and lunch).

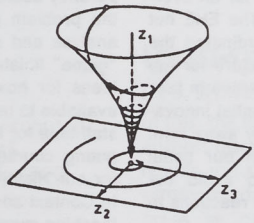
L. Perko, Northern Arizona University, Flagstaff, AZ

Differential Equations and Dynamical Systems

1991. XII, 403 pp. 177 figs. (Texts in Applied Mathematics, Vol. 7) Hardcover £28.00
ISBN 3-540-97443-1

The main purpose of the book is to introduce students to the qualitative and geometric theory of ordinary differential equations originated by Henri Poincaré at the end of the 19th century. It is also intended as a reference book for mathematicians doing research on dynamical systems.
There are several new features in this book such as the simplified proof of the Hartman-Grobman Theorem and examples illustrating the proof, map in the theory of limit cycles, an efficient method for obtaining the global phase portrait of two-dimensional systems, and the description of the behavior of a one-parameter family of limit cycles. The authors show the global qualitative theory of a nonlinear dynamical system leads to an understanding of the solution set of the nonlinear system that rivals the understanding that we have of linear flows.





Contents: Preface. – Linear Systems. – Nonlinear Systems: Local Theory. – Nonlinear Systems: Global Theory. – Nonlinear Systems: Bifurcation Theory. – Bibliography. – Index.

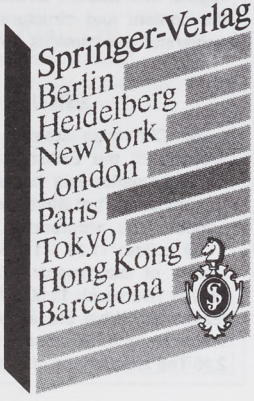
F. Verhulst, State University of Utrecht

Nonlinear Differential Equations and Dynamical Systems

1990. IX, 227 pp. 107 figs. 2 tabs. (Universitext) Softcover £13.50 ISBN 3-540-50628-4

This text bridges the gap between elementary courses on differential equations and the research literature. Subject material from both the qualitative and the quantitative point of view is presented. Many examples illustrate the theory and the reader should be able to start doing research after studying this book.

Contents: Introduction. – Autonomous equations. – Critical points. – Periodic solutions. – Introduction to the theory of stability. – Linear equations. – Stability by linearisation. – Stability analysis by direct method. – Introduction to pertubation theory. – The Poincaré-Lindstedt method. – The method of averaging. – Relaxation oscillations. – Bifurcation theory. – Chaos. – Hamiltonian systems. – Appendices. – Answers and hints to the exercises. – References. – Index.



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THE DEVELOPMENT OF MATHEMATICS FROM 1900 TO 1950

The Luxembourg Mathematical Society is organizing a Colloquium on The Development of Mathematics from 1900 to 1950 to be held at Chateau de Bourglinster close to the city of Luxembourg from 29th to 30th June 1992. It is being sponsored by the European Mathematical Society and will be supported by the Luxembourg government and several scientific organizations.

The conference aims to trace the main accomplishments in mathematics during the first half of the 20th century and to stress their impact on present mathematics. Some ten lectures, followed by discussions, will focus on that analysis and more specifically on the following themes: Mathematical logic, number theory, algebra, general topology, algebraic topology, differential geometry, integration and measure, functional analysis, harmonic analysis, analytical functions, differential equations, partial differential equations, probability theory, numerical analysis.

There will be a registration fee of 1,500 Belgian francs, or 1,000 Belgian francs for members of the European Mathematical Society. For further information write to Société Mathématique du Luxembourg, Centre Unversitaire de Luxembourg, 162A Avenue de la Faiencerie, L-1511 Luxembourg.

DIFFERENTIAL EQUATIONS COLLOQUIUM

The Third International Colloquium on Differential Equations will be held in Plovdiv, Bulgaria from 18th to 22nd August 1992. The Colloquium will be in two sections: Ordinary Differential Equations and Partial Differential Equations. The duration of the talks will be 20 minutes. Advise Professor Bainov the Chairman of the Organizing Committee by 1st January if you intend to participate or deliver a talk, sending an abstract which should be camera ready. For further information write to: Professor Drumi Bainov, Chairman of the Organizing Committee, Mathematical Faculty, Plovidv University, Tsar Assen Str.24, Plovdiv 4000, Bulgaria.

ANALYSIS AND PROBABILITY SYMPOSIUM

The Third European Symposium on Analysis and Probability will be held in Paris, France from 3rd to 10th January 1992. The confirmed speakers are: H. Airault (Paris), S. Albeverio (Bochum), M. Barlow (Cambridge), R. Buckdahn (Berlin), D. Elworthy (Warwick), J.P. Kahane (Orsay), S. Kotani (Tokyo), W. Hansen (Bielefeld), L. Hudson (Nottingham), W. Kendall (Warwick), G. Lawler (Durham), J.F. Le Gall (Paris), Y. Le Jan (Paris), T. Lyons (Edinburgh), P.A. Meyer (Strasbourg), S. Molchanov (Irvine), N. Nagasawa (Zurich), D. Nualart (Barcelona), M. Oakda (Sendai), B. Oksendale (Oslo), M. Pinsky (Evanston), S. Shigekawa (Kyoto), J. Zambrini (Lisbon).

Further information can be obtained from P. Malliavin, 10 rue Saint Louis en l'Isle, 75004 Paris. Fax: 33 1 44 27 53 45.

CLASSICAL AND NUMERICAL RELATIVITY

A one day conference and four day workshop will be be held on Classical and Numerical Relativity at the Faculty of Mathematical Studies, University of Southampton from 16th to 20th December 1991. The invited speakers will include: J. Centrella (USA), C. Evans (USA), J. Miller (Italy), K. Oohara (Japan), J. Winicour (USA).

For further details contact C.J.S. Clarke, Faculty of Mathematical Studies, University of Southampton, Southampton SO9 5NH, e-mail: cjsc@uk.ac.soton.maths, telephone: 0703 593700. The conference is being supported by the London Mathematical Society, the Institute of Physics and the SERC.

LEEDS DIFFERENTIAL GEOMETRY DAY

A Leeds Differential Geometry Day will be held on Friday 13th December 1991 in Room G, Mathematics Building, University of Leeds. The programme is as follows: 10.45 Robin Tucker (Lancaster), Exterior differential systems and their applications; 11.50 Peter Dombrowski (Cologne), On the geometry of the tangent bundle; 14.15 Elmer Rees (Edinburgh), Parameterized Morse theory and focal sets; 15.45 J.A. Jiminez (visiting Warwick), Higher order symmetric spaces. Morning coffee will be served at 10.15 on Level 9.

Further details are available from Alan West on e-mail: pmt6aw@uk.ac.leeds.cms1. The meeting is being supported by the London Mathematical Society.

HIMED 92

An International Conference on the Uses of History in Mathematics Education will be held at the University of Nottingham from 10th to 12th April 1992. For further information write to Costel Harnasz, Manchester LEA, Inspection & Advisory Service, The Greenheys Centre, Upper Lloyd Street, Manchester M14 4HZ. HIMED 92 is organised on behalf of the British Society for the History of Mathematics by John Warner, Costel Harnasz and Neil Bibby and is financially supported by the London Mathematical Society.

MATHEMATICIANS VISITING THE UK IN 1991/92

ABERDEEN UNIVERSITY

Dr R. Maartens (Witwatersrand, South Africa) General Relativity, 11 Nov 91 - 16 Dec 91.

Dr A. Held (Berne, Switzerland) General Relativity, Summer 1992.

Dr A.L. Gergely (Budapest, Hungary) General Relativity, 1992.

Professor P.L. Waterman (University of N. Illinois, USA) Möbius Groups, 15 May 92 - 15 Aug 92.

Mr Yong Ping Chen (University of Shenyang, China) Analysis and Differential Equations, until Apr 1992.

BIRKBECK COLLEGE

Dr V. Neimanis (University of Latvia) Probability Theory and Statistics, Jan 92.

BRADFORD UNIVERSITY

Dr I.D. Coope (University of Canterbury, New Zealand) Optimisation, Sep 91 - Dec 91.

CAMBRIDGE UNIVERSITY, DAMTP

Professor N. Baba (University of Osaka) Fluid Dynamics, Apr 92 - Jan 93.

Professor G.I. Barenblatt (Institute of Oceanology, Academy of Sciences, Moscow) Fluid Dynamics, Jan 91 - Mar 92.

Dr M. Bursik (California Institute of Technology) Geophysical Fluid Dynamics, Oct 91 - Dec 91.

Professor D.G. Caldi (Buffalo, New York) Theoretical Physics, Oct 91 - Aug 92.

Professor F. Cattaneo (University of Chicago) Geophysical and Astrophysical Fluid Dynamics, Dec 91.

Professor H-R Cho (University of Toronto) Geophysical Fluid Dynamics, Mar 92 - Jun 92.

Dr P. Cooper (University of Wollongong) Fluid Dynamics, Mar 92 - Jun 92.

Dr N. Deruelle (Paris) General Relativity and Gravitation, Jan 90 - Nov 91.

Dr G. Gurevitch (U.S.S.R.) Theoretical Physics, Sep 91 - Dec 91.

Professor Y. Hagiwara (Kyoto University) Fluid Mechanics, Oct 91 - Sep 92.

Mr R. Kerr (British Navy) Ocean Acoustics, Sep 91 - Dec 91.

Dr P.S. Letelier (Campinas, Brazil) General Relativity and Gravitation, Apr 92 - Jun 92.

Professor T. Maxworthy (S. California University, Los Angeles) Geophysical Fluid Dynamics, Jul 92 - Aug 92.

Dr J. Nycander (Uppsala University, Sweden) Geophysical Fluid Dynamics, Dec 91 - Jul 92.

Professor O.M. Phillips (Johns Hopkins, Baltimore) Geophysical Fluid Dynamics, Jan 92 - Sep 92.

Dr H-J Pohle (University of Leipzig) General Relativity and Gravitation, Oct 91 - Sep 92.

Dr A. Tseytlin (Lebedev Institute, Moscow) Theoretical Physics, Oct 91 - Sep 92.

Dr S.V. Vorontsov (Academy of Sciences, Moscow) Geophysics and Astrophysics Fluid Dynamics, Oct 91 - Jun 92.

Professor D. Wilson (University of Alberta) Environmental Fluid Dynamics, Dec 91 - Aug 92.

Professor M.G. Worster (Northwestern University, Evanston, Illinois) Geophysical Fluid Dynamics, Apr 92 - Aug 92.

CAMBRIDGE UNIVERSITY, DPM&MS

Professor B. Aupetit (Université Laval, Quebec) Analysis, 1991 - 92.

Professor A. Joyal (University of Quebec, Montreal) Category Theory, 1991 - 92.

Dr S. Kamiya (Okayama University of Science) Analysis, Sep 90 - Mar 92.

Professor B.H. Maddox (Eckerd College, St Petersberg, Florida) History of Mathematics, M 91.

Professor H. Murakami (Osaka City University) Topology, 15 Jan 92 - 15 Nov 92.

Dr M. Papatriantafillou (University of Athens) Differential Geometry and Global Analysis, 1 Oct 91 - 31 May 92.

Professor S.V. Ullom (University of Illinois) Number Theory, M 91.

Professor E. Vassiliou (University of Athens) Differential Geometry and Global Analysis, 1 Oct 91 - 31 May 92.

Professor G. Wüstholz (ETH Zürich) Number Theory, L 92.

CITY UNIVERSITY

Dr A. Shidfar (Iran University of Science and Technology) Biharmonic Theory, Differential Equations, 1 Jan 92 - 30 Sep 92.

DURHAM UNIVERSITY

Professor D.M. Fradkin (Wayne State University,U.S.A.) Theoretical Physics, Sep 91 - Sep 92.

EDINBURGH UNIVERSITY

Dr I. Bong Jung (Kyungpook National University, Korea) Operator Algebras, Dec 91 - Dec 92.

Professor R. Gideon (Montana State University, U.S.A.) Rank Correlation, April 92.

Dr A.A. Grigor'yan (Institute of Control Sciences) Potential Theory, 25 Nov 91 - 13 Dec 91.

Dr M.H.A. Hashim (Khartoum University, Sudan) Quadratic Programming and Optimization, 15 Jul 91 - 15 Dec 91.

Dr N. Manganaro (Messina, Italy) Applied Mathematics, Mar/Apr 1992.

Dr T. Salisbury (York University, Ontario, Canada) Probability Theory, 21 Jun 91 - 31 Dec 91.

ESSEX UNIVERSITY

Dr E. Torlaschi (University of Quebec, Montreal) Meteorology, Jul 91 - Dec 91.

GLASGOW UNIVERSITY

Dr N.V. Dung (Hanoi) Ring Theory, 19 Nov 91 - 14 Dec 91.

Professor E. Puczylowski (Warsaw) Ring Theory, 30 Oct 91 - 20 Nov 91.

HERIOT-WATT UNIVERSITY

Professor M.N. Dyer (University of Oregon) Low-Dimensional Topology, Apr 92 - May 92.

Professor D. James (University of Michigan) Computer Aided Learning in Mathematics, 9 Aug 91 - 15 Dec 91.

Professor R.D. James (University of Minnesota) Elasticity, Continuum Mechanics, 15 Aug 91 - 20 Aug 92.

HULL UNIVERSITY

Mr J.M. Gaiser (University of Tübingen, Germany) Probability on Groups, 1 Sep 91 - 31 Aug 92.

Dr J. Maks (Delft, Netherlands) Clifford Algebras and Combinatorics, Oct 90 - Sept 92.

Dr J. Sousa Pinto (Universidade de Aveiro, Portugal) Generalised Functions and Nonstandard Analysis, Nov 91 - Jan 92.

Dr K. Szilder (University of Edmonton, Canada) Ice Accretion, 1 Nov 91 - 31 Mar 92.

KENT UNIVERSITY

Dr S.H. Huxham (University of Technology, Sydney) Statistical Education, Applied Statistics, Statistics in Finance, Sep 91 - 14 Jan 92.

KING'S COLLEGE LONDON

Dr M. Lambrou (University of Crete) Non-selfadjoint Operator Algebras Banach Spaces, Sep 91 - Aug 92.

LANCASTER UNIVERSITY

Dr A. Azzaline (Padua University) Statistics, Jan 92.

Dr A. Baccini (Paul Sabatier University, Toulouse) Statistics, Oct 91 - Nov 91.

Dr M. Badri (Saudi Arabia) Functional Analysis, Sep 91 - Aug 92.

Dr L. Ferne (Paul Sabatier University, Toulouse) Statistics, Nov 91 - Dec 91.

Dr D.F. Findley (U.S. Bureau of the Census, Statistical Research Division) Time Series Analysis, May 1992.

Dr V.V. Peller (Steklov Institute, Leningrad) Functional Analysis, Oct 91 - Sep 92.

Dr A. Verbyla (Adelaide University) Stastistics, Jul 92 - Dec 92.

LEEDS UNIVERSITY

Dr J. Berndt (University of Cologne, Germany) Differential Geometry, Feb 92 - 09 Mar 92.

Dr S. Catoui (University of Bucharest, Romania) Graded Rings, Jan 92 - Jun 92.

Professor C. Goodall (Penn State University) Shape Analysis, Jul 92.

Professor V.G. Hart (Queensland University) Applied - Elasticity Biological Applications, 9 May 92 - 15 Jun 92.

Professor J.O. Kessler (Arizona University) Pattern Formation - Swimming Micro Organism, Jun 92 - Aug 92.

Dr T. Moore (Massey University, New Zealand) Image Analysis, Until Dec 91.

Professor L.W. Small (UCSD, California, U.S.A.) Ring Theory, Jan 92 - Jun 92.

Professor D. Tyler (Rutgers University, U.S.A.) Robustners, May 92 - Jun 92.

LIVERPOOL UNIVERSITY

Professor B.J. Papantoniou (University of Petras, Greece) Differential Geometry, Sep 91 - Sept 92.

Dr W.L. Marar (Universidade de São Paulo, Brazil) Singularity Theory, Aug 91 - Aug 92.

Dr S. Izumiya (Hokkaido University, Japan) Singularity Theory, Apr 91 - Jan 92

LONDON SCHOOL OF ECONOMICS

Professor A. Beck (University of Wisconsin, Madison) Analysis, 8 Jul 91 - 1 Aug 92.

MANCHESTER UNIVERSITY

Professor P. Baum (Penn State University) K-Homology and Index Theory, 10 Dec - 17 Dec 91.

Dr V. Gorbunov (Novosibirsk, USSR) Pure Mathematics, Jan 91 - Dec 91.

Professor T. Kühn (Leipzig) Pure Mathematics, 4 May 92 - 11 May 92.

Dr Yu.V. Kuz'min (Moscow) Pure Mathematics, 15 Jan 92 - 15 Feb 92.

Professor A.E. Zalesskii (Minsk) Pure Mathematics, 14 Feb 92 - 25 Mar 92.

NOTTINGHAM UNIVERSITY

Professor K.R. Parthasarathy (ISI New Delhi) Quantum Probability, 1 May 92 - 31 Aug 92.

OPEN UNIVERSITY

Mr J.R. Ortiz (Universidad Nacional Abierta, Venezuela) Pure Mathematics, 1 Jan 92 - 31 Dec 92.

OX FORD UNIVERSITY

Dr Y. Akyildiz (Dhahran, Saudi Arabia) Comb. Theory, Jan 92 - Sept 92.

Dr A. Berarducci (Firenze, Italy) Logical Systems, 10 Sep 91 - 10 Dec 91.

Professor G. Bordalo (Lisbon, Portugal) Lattice Theory, 2 weeks in Jan/Feb 92.

Dr W. Brandts (University of Toronto) Complex Systems, Aug 91 - Sept 92.

Dr R. Brussee (Leiden, Netherlands) Vector Bundles, Jan 92 - Dec 92.

Dr A.L. Carey (Adelaide, Australia) 10 Jun 92 - 20 Jul 92.

Professor W. Craig (Brown University, U.S.A.) Nonlinear Systems, Jan 91 - Dec 91.

Dr C.M. Doria (Rio, Brazil) Differential Geometry, 1991 - 92.

Dr S. -i. Ei (Hiroshima, Japan) Perturbation Theory, 1 Oct 91 - 31 Mar 92.

Dr E. Feireisl (Prague, Czechoslovakia) Differential Equations, Jan 92 - Dec 92.

Professor J. Fink (Kalamazoo University, U.S.A.) Finite Group Theory, Sept 91 - Aug 92.

Professor A.K. Head (CSIRO, Australia) Dislocation Theory, Nov 91.

Professor M. Kusuda (Osaka, Japan) Operator Algebra, Jul 91 - Feb 92.

Dr K. Landman (Melbourne, Australia) Phy. Appl. Math., 15 Jul 91 - 15 Oct 91.

Professor Ling Hsiao (Beijing, China) Differential Equations, 1 week mid April 92.

Professor A.K. Macpherson (Bethlehem, U.S.A.) Crystals, Sept 91 - Dec 91.

Dr G. Merkelis (Lithuania, USSR) Atomic Physics, 6 - 8 Months in 92.

Professor F. Miraglia (S. Paulo, Brazil) Logic, Sept 91 - Sept 92.

Dr M.R. Myerscough (Sydney, Australia) Mathematical Biology, mid Jun 92 - Jul 92.

Professor J. Nakagawa (Joetsu University, Japan) Number Theory, 20 May 91 - 28 Feb 92.

Dr A. L. Portnyagin (Vernadsky Institute, Moscow) Nov 91.

Dr D.M. Riley (Alberta University, Canada) Algebra, Aug 91 - Jul 92.

Professor J.M.R. Sanjurjo (Madrid, Spain) Topology, 15 Jul 91 - 15 Sept 91.

Professor R. Santos (Lisbon, Portugal) Lattice Theory

Dr A.C. Scott (Massachusetts, U.S.A.)

Dr A. Shalev (Jerusalem, Israel) Algebra, Oct 91 - Feb 92.

Professor M. Ughi (Trieste, Italy) PDE's and FBP's, Sept 91.

Dr F. Verroca (Bari, Italy) Differential Geometry, Jan 92 - Aug 92.

Professor T. White (Michigan, U.S.A.) Comb/ Alg, Sept 91 - Jul 92.

Dr M. Wrobel (Poland) Applied Mechanics, Sept 91 - Jun 92.

Dr V. L. Yakhontov (Leningrad State, USSR) Atomic Physics, 1992.

Dr E. Zelmanov (Novosibirsk) Jordan Algebra, Jan 91 - Dec 91.

QUEEN MARY AND WESTFIELD COLLEGE

Professor K. Chitre (University of Bombay) Astronomy, May 92 - Jul 92.

Professor S. Dermott (University of Florida) Astronomy, 22 Nov 91 - 29 Nov 91.

Dr L. Diosi (Central Physics Research Institute Budapest) Dynamics, 22 Oct 91 - 28 Oct 91.
Professor D.C. Lin (University of Santa Cruz, U.S.A.) Astronomy, Aug 91 - Aug 92.
Dr M. Reboucas (Centro Bras. Fisicas, Brazil) Applied Mathematics, 12 Dec 91 - 19 Dec 91.
Professor J.R. Roisin (Institut de Math., Louvain la Neuve) Algebra, 4 Nov 91 - 20 Dec 91.
Professor A. Shalev (Hebrew University, Israel) Pure Mathematics, until Jan 92.
Professor G. Wall (University of Sydney) Algebra, 10 Oct 91 - 30 Nov 91.

ROYAL HOLLOWAY & BEDFORD NEW COLLEGE

Dr L.R.A. Casse (Adelaide University) Finite Geometry, Mar 92 - Jul 92.
Dr H. Gilbert (CNET PAA/ TSA/ SRC) Encryption Algorithms, Mar 92.

SHEFFIELD UNIVERSITY

Dr M.H. Bijan-Zadeh (Payame-Noor University, Tehran) Commutative Algebra, 1 Feb 92 - 31 Jan 93.

SOUTHAMPTON UNIVERSITY

G. Bergquist (Linkoping, Sweden) General Relativity, until summer 92.
S. Bokhari (Quaid-Aza, Pakistan) Applied, Oct 91 for 10 months.
J.E. Corrente (Sao Paulo,Brazil) Statistics, Jan 92 for 1 year.
Dr Gromadzki (Bydgoszcz, Poland) Group Theory, Oct 91 - Jan 92.
Ms M. Izquierdo (Zaragoza, Spain) Discrete Groups, until end Nov 91.

ST ANDREWS UNIVERSITY

Dr M.D.E. Conder (Auckland University, New Zealand) Combinatorial Group Theory, 1 Sep 91 -30 Sep 92.
Professor I. Miyamoto (Yamanashi University, Japan) Computing and Group Theory, 10 Jul 91 - 10 Feb 93.
Mr L. Wang (Yunan Institute of Finance and Trade) Statistics, Jan 92 - Dec 92.
Professor L-S Zhang (Shanghai University of Science and Technology, China) Nondifferentiable Optimization, June 91 - June 92.

STRATHCLYDE UNIVERSITY

Professor A. Kufner (Mathematical Institute, Czechoslovakian Academy of Science) Nonlinear P.D.E., 1 Nov - 21 Nov.

UMIST

Dr M.N. Bogoliubov (Steklov Mathematics Institute, USSR) Mathematical Physics, Oct - Dec 91.
Professor K. Ciesicki (Warsaw University of Technology) Fluid Flow and Biomedical Engineering, Jan 92 - Jul 92.
Dr S.M. Karabassi (Teachers Training University Yazd, Iran) Optimal Control, Oct 91 - Sep 92.
Professor Yu. V. Kuz'min (Moscow Institute of Railway Transportation Engineers) Group Theory, Jan 92.
Dr K.S. Lim (University of Singapore) Mathematical Statistics, 1 Sep 91 - 31 May 92.
Professor A.J. Osiadacz (Warsaw University of Technology) Automation, Robotics and Percolation, 2 - 16 Nov 91 and Jan 92 - Jul 92.

UNIVERSITY COLLEGE, LONDON

Dr S.I. Grossman (University of Montana, U.S.A.) Analytic Number Theory, Sep 91- Dec 91 and Apr 92 - Sep 92.
Professor M Laczskovich (Eotvos University Budapest, Hungary) Combinatorics, Jan 92 - Mar 92.
Professor J. Pach (Mathematical Institute, Hungarian Academy of Sciences Budapest) Combinatorics, Sep 91 - Jan 92.

UNIVERSITY COLLEGE OF WALES

Dr J.A. Cooper (ANU, Caneberra) Combinatorics, Sep 91 - Dec 91.

UNIVERSITY OF NORTH WALES

Professor Nguyen to Nhu (Vietnamese Academy of Sciences, Hanoi) General Topology, 1 Oct 91 - 30 Sep 92.
Dr M. Pfenniger (ETH, Zürich) Algebraic Topology, 1 Oct 91 - 30 Sep 92.

UNIVERSITY OF WALES COLLEGE OF CARDIFF

Professor M.C. Hofmann (Skidmore College, Saratoga Springs, U.S.A.) Group Theory, 6 Jan 92 - 31 Jul 92.
Professor G. Kolesnik (California State University, Los Angeles, U.S.A.) Analytic Number Theory, 6 Jan 92 - 5 Feb 92.
Professor K. Matsumoto (Iwate University, Morioka, Japan) Analytic Number Theory, Dec 91 - Sep 92.
Professor H. Smith (Bucknell University, Lewisburg, U.S.A.) Group Theory, Jan 92 - mid Aug 92.

WARWICK UNIVERSITY

Professor S. Bauer (University of Gottingen) Gauge Theory, 1 Apr - 31 Jul 92.
Professor J-P. Bourguignon (Ecole Polytechnique) Gauge Theory, uncertain.
Professor C.P. Boyer (University of New Mexico) Gauge Theory, May - Jul 92.
Professor S. Bradlow (University of California) Gauge Theory, Academic Year 91/92.
Professor N. Buchdahl (University of Tulane) Gauge Theory, Jul 92.
Professor R. Cohen (University of Stanford) Gauge Theory, 15 Jun - 31 Jul 92.
Professor K. Corlette (University of Chicago) Gauge Theory, Mar - Jul 92.
Professor G. Daskalopoulos (University of Chicago) Gauge Theory, 24 Jun - 24 Jul 92.
Professor Y. Eliashberg (University of Stanford) Gauge Theory, July 92.
Professor R. Fintushel (University of Michigan) Gauge Theory, Jul 92.
Professor D. Freed (University of Texas) Gauge Theory, Mar- Apr 92.
Professor R. Friedman (University of Columbia) Gauge Theory, either Mar or May - Jun 92.
Professor C. Frohman (University of Iowa) Gauge Theory, 13 Jul - 25 Jul 92.
Professor M. Furuta (University of Tokyo) Gauge Theory, 6 Jul - 31 Jul 92.
Professor A. Givental (University of California) Gauge Theory, Jul 92.
Professor Yu. E Gliklikh (Voronezh State University) Stochastic Analysis, between Sept and Dec 91.
Professor N. Goncharuk (Kiev Polytechnic Institute) Stochastic Analysis, 9 Nov - 2 Dec 91.
Professor D. Groisser (University of Florida) Gauge Theory, Mar - Jul 92.
Professor M. Gromov (IHES) Gauge Theory, 13 Jul - 25 Jul 92.
Professor H. Hofer (University of Ruhr) Gauge Theory, 2 weeks Mar or April 92.
Professor J. Hurtubise (McGill University) Gauge Theory, 10 Mar - 11 Apr 92.
Professor J.A. Jimenez (Penn State University) Gauge Theory, Academic Year 91/92.
Professor V. Jones (University of California) Gauge Theory, Jul 92.

Dr S.E. Koh (Kon-kuk University) Differential Geometry, Mar 92 - Feb 93.
Professor M. Kreck (Max-Planck Institute Bonn) Gauge Theory, Jul 92.
Professor R. Lawrence (Harvard University) Gauge Theory, Apr and May 92.
Professor B. Lawson (SUNY) Gauge Theory, May - Jun 92.
Professor Yu. Manin (Steklov Institute) Gauge Theory, 1 Jul - 31 Jul 92.
Professor B. Mann (University of New Mexico) Gauge Theory, May - Jul 92.
Professor D. McDuff (SUNY) Gauge Theory, 2 weeks between Mar and Jun 92.
Professor J. Milgram (University of Stanford) Gauge Theory, Apr 92.
Professor J. Morgan (University of Columbia) Gauge Theory, 15 Jun - 30 Jun 92.
Professor T. Mrowka (University of Stanford) Gauge Theory, July 92.
Professor M. Murray (Australian National University) Gauge Theory, Jul 92.
Professor M.S. Narasimhan (Tata Institute) Gauge Theory, 12 Jul - 25 Jul 92.
Professor T.H. Parker (University of Michigan) Gauge Theory, Summer 92.
Professor L. Sadun (Courant Institute) Gauge Theory, Jun - Jul 92.
Professor H. Schirmer (Carleton University) Algebraic Topology, Oct or Nov 91.
Professor J. Seade (University of Mexico) Gauge Theory, Short visits throughout the year.
Professor J. Segert (University of Missouri) Gauge Theory, 1 Jul - 10 Aug 92.
Professor G. Sénizergues (University of Bordeaux) Group Theory and Computation, Academic year 91/92.
Professor C. Simpson (University of Princeton) Gauge Theory, Sometime between Apr and Jun 92.
Dr V.R. Steblovskaya (Kiev Polytechnic Institute) Stochastic Analysis, 9 Nov - 2 Dec 92.
Professor R.J. Stern (University of California) Gauge Theory, 6 Apr - 10 Apr and 13 Jul - 24 Jul 92.
Professor C. Taubes (Harvard University) Gauge Theory, 6 Apr - 10 Apr 92.
Professor A. Tyurin (Steklov Institute) Gauge Theory, Apr and May 92.
Professor K. Uhlenbeck (University of Texas) Gauge Theory, beginning Feb - beginning May 92.
Professor K. Walker (University of Utah) Gauge Theory, 1 Jun - 30 Jun 92.
Professor V. Zocca (University Maryland) Gauge Theory, 2 Oct - 30 Dec 92.

YORK UNIVERSITY

Professor A. Baernstein (University of St Louis) Complex Analysis, Mar 92.
Professor V.I. Bernik (Byelorussian Academy of Sciences) Number Theory, 13 Oct 91 - 25 Nov 91.
Dr Y.V. Melnichuk (Lvov Polytechnical Institute) Number Theory, 13 Oct 91 - 25 Nov 91.
Professor D. Storvick (University of Minnesota) Complex Variables and Mathematical Physics, May 92.

INTERNATIONAL CONGRESS OF MATHEMATICIANS 1994

The 1994 International Congress of Mathematicians will be held from 3rd to 11th August 1994 in Zurich, Switzerland. The meeting of the General Assembly of the IMU will be from 31st July to 2nd August. It would be helpful if organisers of conferences to be held in that period would send details to Professor Christian Blatter, Mathematik, ETH-Zentrum, CH-8092 Zurich, Switzerland. Fax 01 252 3401.

EUROPEAN MATHEMATICAL SOCIETY

Members of the LMS who paid a 1991 subscription for the EMS should have received the first issue of the EMS Newsletter in September. The second issue is expected in December, and thereafter it will appear quarterly. For 1992 and future years, LMS members who wish to subscribe to the EMS should pay their EMS dues at the same time as their LMS subscription, by completing the appropriate line on the LMS subscription form and paying the additional EMS fee of £11.00. This applies to all LMS members, whether or not they joined the EMS for 1991.

CONFERENCE ON FIBONACCI NUMBERS AND THEIR APPLICATIONS

The Fifth International Conference on Fibonacci Numbers and their Applications will take place at the University of St Andrews from 20th to 24th July 1992. This conference is sponsored jointly by the Fibonacci Association and the University of St Andrews, with additional support from the London Mathematical Society. Further details can be obtained from Dr G.M. Philips, Department of Mathematical and Computational Sciences, University of St Andrews, Fife KY16 9SS.

Papers on all branches of mathematics and science related to the Fibonacci numbers as well as recurrences and their generalisations are welcome. Abstracts are to be submitted by 15th March 1992. Manuscripts are due by 30th May 1992. Abstracts and manuscripts should be sent in duplicate following the guidelines for submission of articles found on the inside cover of any recent issue of The Fibonacci Quarterly to: Professor Gerald E. Bergum, The Fibonacci Quarterly, Department of Computer Science, South Dakota State University, PO Box 2201, Brookings, SK 57007-0914, U.S.A.

CONGRATULATIONS

The Society congratulates Dr Bela Bollobas on his election to Membership of the Hungarian Academy of Sciences.

Maxwell Herman Alexander Newman (1897-1984) studied mathematics at St John's Cambridge. His education was interrupted by the war, and he graduated as a Wrangler in 1921. He then taught at Cambridge until 1945, with visits to Vienna and Princeton, and from 1942 to 1945 directed the codebreakers at Bletchley Park. With Hodge and Whitehead he launched the BMC in 1949. He worked initially on combinatorial topology, and after the war was influential in establishing computing at Manchester, where from 1945 to 1964 he built up a strong mathematics department. In 1939 he was elected an FRS and in 1959 awarded the Sylvester medal. The London Mathematical Society awarded him the de Morgan medal in 1962. He was the Society's 43rd President, from 1949-51.

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.

1991

DECEMBER

6	Edinburgh Mathematical Society Meeting, Edinburgh (186)
7-10	Canadian Mathematical Society Winter Meeting, British Columbia, Canada (188)
9	Open University Christmas Lecture, Open University (188)
9-13	European Women in Mathematics, France (180)

1992

JANUARY

11	Clifford's Geometric Algebra Meeting, Canterbury (186)
17	LMS Meeting, London
17	Edinburgh Mathematical Society Meeting, Edinburgh (186)

FEBRUARY

2-6	Australian Applied Mathematics Conference, NSW, Australia (186)
14	Edinburgh Mathematical Society Meeting, Edinburgh (186)
21	LMS Meeting, Bristol

MARCH

13	Edinburgh Mathematical Society Meeting, Dundee (186)
20	LMS Meeting, London
30-2 April	34th British Theoretical Mechanics Colloquium, Keele (185)

APRIL

6-10	British Mathematical Colloquium, Strathclyde (188)
7-10	Annual Iranian Mathematics Conference, Bakhtaran, Iran (188)
10-12	The Uses of History in Mathematics Education Conference, Nottingham (186)
12-16	Diophantine Approximation and Abelian Varieties Conference, Soesterberg, Netherlands (187)
13-16	LMS Invited Lectures, Professor P.J. Olver, Bath University (187)

MAY

1	Edinburgh Mathematical Society Meeting, Stirling (186)
15	LMS Meeting, London
18-22	Nascode VIII, Dublin, Ireland (188)
26-31	Engineering Mathematics and Applications Symposium, Shenzhen, China (188)
29	Edinburgh Mathematical Society Meeting, Aberdeen (186)

JUNE

19	LMS Meeting, London
22-26	Dundee Conference on Ordinary and Partial Differential Equations, Dundee (188)
27-3 July	The Penrose Transform and Analytic Cohomology in Representation Theory Connference, Massachusetts, U.S.A. (186)
29-1 July	Joint AMS/LMS Meeting, Cambridge (155)

JULY

4-14	Evolutionary Problems, Durham (178)
5-9	14th British Combinatorial Conference, Keele (188)
6-10	Mathematical Conferences in Perth, Australia (186)
6-10	European Congress of Mathematics, Paris, France (180) (188)
11-18	St Andrews Colloquium, St Andrews (185)
14-24	Non-commutative Rings, Durham (178)
21-31	The Geometry of Operator Algebras and Banach Spaces, Durham (178)

AUGUST

3-7	International Linear Algebra Society Meeting, Lisbon, Portugal (186)
16-23	International Congress on Mathematical Education, Canada (175)
17-21	Bail VI, Colorado, USA (188)

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 071- 437 5377, Fax 071-439 4629, E-mail lms@uk.ac.kcl.cc.oak.

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