

# THE LONDON MATHEMATICAL SOCIETY NEWSLETTER

No. 216

May 1994

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## FORTHCOMING SOCIETY MEETINGS

Friday, Saturday, 13-14 May 1994, Leeds  
**Ring Theory and Representation Theory**

Friday 17 June 1994, Burlington House  
B.J. Birch, J. Eells

Friday 21 October 1994, Burlington House  
**Mathematical Biology**

A. Fowler, V. Isham, T. Pedley, D. Rand

Friday 18 November 1994, Burlington House  
**Annual General Meeting**

B.E. Johnson, J.R. Ringrose (Presidential Address)

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## COUNCIL DIARY

Council met on Friday 18 March 1994. The question of four-year undergraduate degrees and the proposed research MSc ('MRes') rumbles on. We had in front of us a long consultative document from the Office of Science and Technology, on 'A new structure for postgraduate research training supported by the research councils'. (We saw with some chagrin that the consultation list included for example East Midlands Electricity and the Food and Drink Federation, but not the London Mathematical Society; we had to ring up and ask for a copy. There may be a moral about improving the visibility of the LMS in political circles.) The Society is sending a response to the document. In our view it is important that graduates from four-year MMath courses should be able to register directly onto PhD courses. But some English universities will probably still want to send their mathematics research students through the MRes route. Scottish universities which already have four-year undergraduate mathematics degrees could suffer from decisions made with a view to England and Wales.

Speaking of political visibility, we reas-

serted our support for Save British Science, which has done a sterling job collecting information about funding for science. We also discussed how we might strengthen our links with politicians friendly to mathematics. (Free membership of the LMS is not an option - like many plausible suggestions, it would need an appeal to the Privy Council to change the Society's Statutes.)

One item reported in the last Council Diary has sadly taken a step backwards. The publishers are still having technical problems about letting authors submit manuscripts for the Bulletin in TeX or LaTeX. The Publications Secretary is looking for ways around the obstruction.

We heard from the Librarian that the LMS has been estimating the work needed to start a collection of mathematical books of historical interest, based on the older books from the existing LMS and University College London holdings. There may well be other historically important items hidden away in departmental libraries around the country, but it would be a major task to hunt them out and catalogue them systematically.

Wilfrid Hodges

## LMS 1994 HONORARY MEMBER

At the Society Meeting on 18 March 1994, Professor A. Connes was elected an Honorary Member of the London Mathematical Society in recognition of his deep contributions to a range of topics, including his classification work in the theory of

von Neumann algebras, his applications of  $C^*$ -algebras to geometry and physics, and his applications of non-commutative differential geometry to models of quantum gravity and quantum field theory.

## FORDER LECTURESHIP 1995

The 1995 Forder Lecturer will be Professor E.G Rees, FRSE, of the University of Edinburgh. The Forder Lecturer is appointed biennially by the London Mathematical Society and the New Zealand Mathematical Society. The Lecturer is a member of the London Mathematical Society normally resident in the United

Kingdom who visits New Zealand for a period of about four weeks. The Lectureship was instituted in 1987 in honour of the late Professor H.G. Forder, formerly of the University of Auckland and a benefactor of the London Mathematical Society

# LONDON MATHEMATICAL SOCIETY

## NOTICE OF GENERAL MEETING

There will be a General Meeting of the Society on Friday 17 June 1994 at 3.30 p.m. in the Linnean Society Lecture Room, Burlington House, Piccadilly, London W1, to consider a proposal by the Council of the Society to delete the existing By-Law II,1 and to substitute that printed below.

The Council of the Society has, in the light of Statute 11, increased the annual subscription of individual members for 1994-95 by £1.00; Council has also increased the prices per volume of the *Bulletin*, the *Journal* and the *Proceedings* to individual members for 1994-95 by 75 pence. The new By-Law II,1 would record the new rates.

### Text of the proposed By-Law II,1

The annual subscription to the Society of Ordinary Members for the 1994-95 session shall be £15.50. The prices of the Society's periodicals to Ordinary Members for the 1994-95 session shall be: **Proceedings** £15.25 per volume, **Journal** £15.25 per volume, **Bulletin** £15.25 per volume.

R. Y. Sharp  
Council and General Secretary

# LONDON MATHEMATICAL SOCIETY

## TWO-DAY MEETING

Friday - Saturday 13-14 May 1994  
University of Leeds

### Ring Theory and Representation Theory

Friday	2.00	Opening Session
	2.05	M. Artin (MIT) "Noncommutative projective geometry"
	3.05	Tea
	3.45	J.T. Stafford (Michigan) "Non commutative curves"
	4.45	Break
	5.00	M.P. Holland(Sheffield) "Grothendieck groups of rings of invariants for linear actions of finite groups"
Saturday	9.15	L.W. Small (UCSD) "Affine rings and their representations"
	10.15	Coffee
	10.45	W.W. Crawley-Boevey (Oxford) "On general representations of quivers"
	11.45	Break
	12.00	C. Ringel (Bielefeld) "Towards a combinatorial description of module categories: the knitting and sewing of components"

The lectures will be held in LT5 of the Roger Stevens Building of the University of Leeds (next to Mathematics).

All interested are very welcome

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A dinner will be held at the Weetwood Hall Conference Centre on the evening of Friday 13 May at 7.30 pm. The cost of the dinner will be £16.50 per person, inclusive of wine. Those wishing to attend should inform Mrs A. Landford, Department of Pure Mathematics, University of Leeds, Leeds LS2 9JT, enclosing a cheque payable to "University of Leeds" to arrive by 7 May. A meeting of the participants in the EC Science Plan Twinning Group on "Invariants and Representations of Algebras" will coincide with this meeting, so there will be additional lectures on Friday morning/Saturday afternoon.

Enquiries may be addressed to R. Hart (e-mail [PMT6RH@uk.ac.leeds](mailto:PMT6RH@uk.ac.leeds)) or J.C. McConnell (e-mail [PMT6JCM@uk.ac.leeds](mailto:PMT6JCM@uk.ac.leeds)) at the above address.

## LMS INVITED LECTURES 1996

The Society's Invited Lectures Series consists of meetings at which a single speaker gives a course of about 10 expository lectures, examining some subject in depth, over a five day period during a University vacation. The meetings are residential and open to all interested. It is intended that the texts of the lectures given in the series shall be published. In addition to full expenses the lecturer is offered a fee of £1000 for giving the course and a further fee of £1500 on delivery of the text in a form suitable for publication.

Previous lecturers have included Professor P.J. Olver, Professor L de Branges and

Dr. J. Madore. For the 1996 meeting, proposals are now invited from any member who, in addition to suggesting a topic and lecturer, would be willing to organise the meeting at the member's own institution or a suitable conference centre. Enquiries about this series should be directed to the Meetings and Membership Secretary, Dr. D.J. Collins, School of Mathematical Sciences, Queen Mary and Westfield College, Mile End Road, London E1 4NS (telephone 071-975-5480; email [d.j.collins@qmw.ac.uk](mailto:d.j.collins@qmw.ac.uk)) to whom proposals should be sent no later than 31 August 1994.

## PROGRAMME AND CONFERENCE FUND

Members are reminded that the Society's Programme and Conference Fund is used to provide financial support for visitors to the UK and for conferences. The fund is administered by the Society's Programme Committee and information about the proposals it is willing to consider was given in the January 1994 issue (No. 212) of the Newsletter. The Meetings and Membership Secretary, Dr.

D.J. Collins, will be pleased to discuss proposals informally with potential applicants and to give advice on submission of an application to the Society. He can be reached at: School of Mathematical Sciences, Queen Mary and Westfield College, Mile End Road, London E1 4NS; telephone 071-975-5480; email [d.j.collins@uk.ac.qmw](mailto:d.j.collins@uk.ac.qmw).

## INTERNATIONAL CONGRESS OF MATHEMATICIANS

Members may like to know that Swissair, as nominated "Official Carrier" of ICM '94, are offering special travel arrangements. Bookings should be made through the appointed tour operator KRT Travel Plc, 17 Saint George Street, Hanover Square, London W1R 9DE, telephone 071 499 7611. It is emphasized that any bookings made are the member's individual responsibility and that no

liability can be accepted by the London Mathematical Society. Furthermore, the appearance of this announcement in the LMS Newsletter should not be interpreted as a recommendation by the LMS of the particular travel arrangements.

Members can obtain a list of invited speakers at the Congress from the LMS Office.

## HARDY LECTURESHIP 1995

The Hardy Lecturer for 1995 will be Professor K.S. Parthasarathy of the Indian Statistical Institute in Delhi. Professor Parthasarathy will visit the United Kingdom for about four weeks during

May and June 1995. A notice with further details and a call for institutions to submit invitations to the Hardy Lecturer will appear in a subsequent Newsletter.

## A LECTURE BY MANDELBROT AT THE OPEN UNIVERSITY

Professor Benoit Mandelbrot will give a public lecture entitled "The Beauty of Fractals and their Usefulness" at the Open

University on 11 May 1994 at 10.45 am in the main lecture theatre. All are welcome.

# LONDON MATHEMATICAL SOCIETY

## Spitalfields Day

Wednesday 1 June 1994

to be held at the

**Isaac Newton Institute for Mathematical Sciences**  
**20 Clarkson Road, Cambridge**

**CELLULAR AUTOMATA, AGGREGATION AND GROWTH**

### Programme

10:30 Coffee

11:00 Royce Zia, Virginia Polytechnic Institute, Blacksburg  
*American Football, Barber Poles and Clouds: Pattern  
Formation in a Noisy Cellular Automaton*

12:00 Lunch

1:30 Deepak Dhar, Tata Institute of Fundamental Research,  
Bombay  
*The Abelian Cellular Automaton Model of Sandpiles*

2:30 Bernard Derrida, Ecole Normale Supérieure, Paris  
*Exact Steady States of Systems out of Equilibrium:  
Asymmetric Exclusion Models*

3:30 Tea

4:00 Henrik Flyvbjerg, Niels Bohr Institute, Copenhagen  
*Dynamics of Froths and Foams*

All interested are welcome to attend. Lunch will be provided at a nominal charge; please let Jane Marsters, Conference Secretary at the Institute, know before Wednesday 25 May if you intend to come in order to help us plan for lunch: telephone (0223) 335984, fax (0223) 330508, e-mail: [j.marsters@newton.cam.ac.uk](mailto:j.marsters@newton.cam.ac.uk). Scientific inquiries may be addressed to E.R. Speer, telephone (0223) 330551, e-mail [e.r.speer@uk.ac.cam.newton](mailto:e.r.speer@uk.ac.cam.newton).

### VISIT OF DR G. BOCHOROV

Dr Gennadii Bochorov, of Moscow Institute of Numerical Mathematics, will be visiting Professor C.T.H. Baker and his group at the Department of Mathematics, University of Manchester from 30 May to 22 June 1994, in order to work on delay differential equations, their application to immunology and related problems, and

their numerical modelling. This visit is supported in part by the London Mathematical Society. Further details may be obtained closer to the date by telephoning the Department of Mathematics at Manchester (tel: 061-275-5800, fax: 061-275-5819).

### VISIT OF PROFESSOR R.M. KAUFFMAN

Professor R.M. Kauffman of the University of Alabama at Birmingham will be visiting the United Kingdom from the end of June, 1994 for about 6 weeks, supported by a Scheme 2 grant from the London Mathematical Society. He will lecture on "Eigenprojection representations, eigenfunction expansions and geometry" at the University of Sussex on 11 July, at the University of Wales College

of Cardiff on 13 July and at the University of Strathclyde Conference on Evolution Equations to be held from 25 to 29 July. Further details may be obtained from Professor D.E. Edmunds, School of Mathematical and Physical Sciences, University of Sussex, Brighton BN1 9QH, Sussex; e-mail: d.e.edmunds@sussex.ac.uk.

### VISIT OF PROFESSOR S. TREIL

Professor Sergei Treil of Michigan State University will be visiting the UK at the end of May 1994, supported by a Scheme 2 Visitor's Grant from the London Mathematical Society. He will give two lectures at a meeting of the North British Functional Analysis Seminar at the University of Edinburgh on Friday 27 May. The titles of the talks are: 2.30 pm "The inverse

spectral problem for self-adjoint Hankel operators" and 4.00 pm "Bases of eigenvectors and of invariant subspaces of contractions". For further details contact G. Blower, Department of Mathematics, Lancaster University. He will also lecture at the University of Leeds (contact J.R. Partington) and Lancaster University (contact N.J. Young).

### 1995 PRIX FERMAT DE RECHERCHE EN MATHÉMATIQUES

Le Prix Fermat récompensera les travaux de recherche de mathématiciens dans des domaines où les contributions de Pierre de Fermat ont été déterminantes: Econcés de principes variationnels; Fondements du calcul des probabilités et de la géométrie analytique; Théorie des nombres.

A l'intérieur de ces domaines, l'esprit du prix est de récompenser plutôt des résultats de recherche qui sont accessibles aux plus grand nombre de mathématiciens professionnels. D'un montant de 100 000 FF, attribués par Matra Mar-

coni Space, le Prix Fermat est décerné tous les deux ans à Toulouse; la quatrième édition aura lieu au Printemps 1995.

Le règlement du Prix, les modalités de dépôts de candidature, son disponibles dès le 1<sup>er</sup> trimestre 1994, auprès de: Prix Fermat de Recherche en Mathématiques, Service des Relations Publiques, Université Paul Sabatier, 118 route de Narbonne, 31062 Toulouse Cédex, France. Date limite de dépôt des candidatures: 20 Décembre 1994. Les candidats potentiels sont priés de se conformer aux modalités de dépôt préconisées dans le règlement.

# LONDON MATHEMATICAL SOCIETY

## 1994 POPULAR LECTURES

**Strathclyde University - Thursday 16 June**

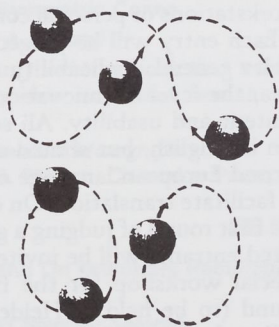
**Manchester University - Friday 17 June**

**Imperial College - Friday 1 July**

**Dr Richard Pinch**

### **FERMAT'S LAST THEOREM**

"This infamous problem, which was posed in the 1630's, may now have succumbed. We describe the successes and failures along the way."



**Dr Colin Wright**

### **JUGGLING**

"Juggling is an ancient art that has baffled and entertained countless people. In this talk we discover a richness and variety of mathematical structure only recently discovered in this skill."

**STRATHCLYDE UNIVERSITY** Commences at 2.00 pm, 3.00 pm refreshments, ends at 4.30 pm. Lecture Room 1, McCance Building, University of Strathclyde, 16 Richmond Street, Glasgow G1 1XQ. Admission is free. For further information contact Dr C. Constanda (041 552 4400 ext 3714) or Dr A. McBride (041 552 4400 ext 3647) at the Department of Mathematics, University of Strathclyde.

**MANCHESTER UNIVERSITY** Commences at 7.00 pm, 8.00 pm refreshments, ends at 9.30 pm. Lecture Theatre B, Roscoe Building, University of Manchester. Admission free, with ticket in advance. Apply by Friday 10 June to Dr M. Prest, Department of Mathematics, University of Manchester M13 9PL. A stamped addressed envelope would be appreciated.

**IMPERIAL COLLEGE, LONDON** Commences at 7.30 pm, 8.30 pm refreshments, ends at 10.00 pm. The Great Hall, Sherfield Building, Imperial College, South Kensington, London SW7. Admission free, with ticket in advance. Apply by Monday 27 June to Miss S.M. Oakes, London Mathematical Society, Burlington House, Piccadilly, London W1V 0NL. A stamped addressed envelope would be appreciated.

## FELLOWSHIP OF THE ROYAL SOCIETY

Amongst those recently elected to Fellowship of the Royal Society were David John Aldous, Professor of Statistics in the University of California at Berkeley, USA, Richard Ewen Borcherds, Professor of Mathematics in the University of California at Berkeley, USA, George Petros Efstathiou, Savilian Profes-

or of Astronomy in the University of Oxford, Peter McCullagh, Professor of Statistics in the University of Chicago, USA, Dusa McDuff, Professor of Mathematics in the State University of New York at Stony Brook, USA, David Sherrington, Wykeham Professor of Theoretical Physics in the University of Oxford.

## EUROPEAN ACADEMIC SOFTWARE AWARD PROGRAMME

The European Academic Software Award Programme (EASA) is a new joint initiative organised by academic groups in Europe, including Austria, Germany, The Netherlands, Sweden, Switzerland and the UK. UK participation is through the Association for Learning Technology (ALT). Entries for the awards will be assessed by an international panel of jurors, and short-listed entrants will attend a small conference at which finalists will present their software and the award winners will be announced.

The purpose of the EASA Programme is to promote excellence in the development and use of high quality academic software for education and research. Software is generally recognised to be a key factor which the European market will need to exploit to remain competitive. Universities and colleges must therefore seek to develop appropriate software and use it effectively with students. The European Academic Software Award Programme is a forum for software authors to gain academic recognition for their efforts. The Programme gives academic recognition to authors by offering the opportunity to enter programs into a broad competition that acknowledges software as a valid contribution to education and research.

Entrants should be affiliated to a European university or other higher education or research institutions. Team entries must include at least one member working in a European higher education establishment. Entries are welcome in all discipline areas and will be grouped into one of thirteen subject categories. There

are no restrictions on types of software or delivery platforms beyond the requirement for relevance to higher education.

For example, software submitted can be: in any academic discipline; designed for students, lecturers, or scientists; in the form of tutorials, simulations or tools; for workstations or personal computers.

Each entry will be judged on the basis of its general applicability in its subject area, the level of innovation, educational content and usability. All software must run in English, but should also support a second European language or be designed to facilitate translation. On completion of the first round of judging a group of short listed entrants will be invited to attend a special workshop for the final selection round (to be held in Heidelberg). Jurors will seek to identify software which advances academic research and education. Note: at time of writing, EASA has no budget to help short-listed UK candidates with travel and expenses for attendance at the Awards Ceremony.

All entries must be submitted on an official entry form, and will include a description of the software together with example screen shots. Short-listed entrants will be expected to present their software at the Awards Ceremony. For further information and entry forms contact: Association for Learning Technology, University of Oxford, 13 Banbury Road, Oxford OX2 6NN, tel: 0865 273281, fax: 0865 273275, e-mail: alt@vax.ox.ac.uk. Receipt of Submissions: 31 May; Awards Ceremony in Heidelberg: 5 - 7 November (provisional date).



# OXFORD UNIVERSITY PRESS

*Oxford University Press is a leading publisher in mathematics and is exclusively responsible for the marketing and distribution of American Mathematical Society books in the UK, Europe, Middle East, and Africa.*

*We are proud to present some of the latest titles from  
OUP and the AMS:*

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*Edited by M. J. Baines and K. W. Morton*

A summary of recent research on topics of current interest on computational aspects of fluid dynamics.

0-19-853696-8, 622 pp., halftones, numerous line figures, Clarendon Press, January 1994

£60.00

## **Analysis on Symmetric Cones**

*J. Faraut and A. Koranyi*

This is the only existing book that treats systematically this important branch of analysis.

*Oxford Mathematical Monographs*  
0-19-853477-9, 256 pp., Clarendon Press, April 1994

£30.00

## **Analysis Of and On Uniformly Rectifiable Sets**

*Guy David and Stephen Semmes*

*Mathematical Surveys and Monographs No. 38*  
0-8218-1537-7, 356 pp. (AMS), February 1994

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## **Nielsen Theory and Dynamical Systems**

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*Contemporary Mathematics No. 152*  
0-8218-5181-0, 350 pp., paperback (AMS), February 1994

£43.00

## **Linear Algebraic Groups and Their Representations**

*Edited by Richard S. Elman, Murray M. Schacher, and V. S. Varadarajan*

*Contemporary Mathematics No. 153*  
0-8218-5161-6, 200 pp., paperback (AMS), January 1994

£35.00

## **Advances in Computational Complexity Theory**

*Edited by Jin-Yi Cai*

*Series in Discrete Mathematics and Theoretical Computer Science No. 13*  
0-8218-6597-8, 209 pp. (AMS), January 1994

£70.00

## **Wave Propagation. Scattering Theory**

*M. Sh. Birman*

*American Mathematical Society Translations—Series 2 No. 157*  
0-8218-7507-8, 256 pp. (AMS), February 1994

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## **The Penrose Transform and Analytic Cohomology in Representation Theory**

*Edited by Michael Eastwood, Joseph Wolf, and Roger Zierau*

*Contemporary Mathematics No. 154*  
0-8218-5176-4, 259 pp., paperback (AMS), January 1994

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# MATHEMATICS AND COMPUTING

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## THE BENEFITS OF A UNIFIED COMPUTING AND MATHEMATICS UNDERGRADUATE DEGREE

We thank Alan Camina for writing the following report on the one-day meeting which the LMS held on 15 November 1993 at the Royal Over-Seas League, London to discuss 'The Benefits of a unified Computing and Mathematics Undergraduate Degree'.

There were 61 delegates representing 44 different universities. The large majority said that they were mathematicians. However, when looking at their departmental or school affiliations, 26 were in departments labelled mathematics and 17 were in departments labelled computing. There were a variety of other labels of which 5 were clearly joint departments, but the others were less clear as to the correct categorisation.

### 1 The Speakers

The morning session began with talks by four speakers on different aspects of the topic. We will summarise some of the main points below.

#### 1.1 Professor C. Mitchell

Professor Chris Mitchell began the session and started by describing the mathematics that was in the computing course at Royal Holloway and Bedford New College, University of London. The students spend 25% of their first year on discrete mathematics and theory. He felt that it was not possible to teach what was needed in both mathematics and computing in three years. He argued that computing science students were not equipped to do research in computing science.

He then went on to consider what we needed to do in the future. There is a need for properly trained software engineers. We should accept that they

need more mathematics, just as engineers and physical scientists do. He proposed three year degrees for high level software technicians, and four year degrees for software engineers. He also suggested that there was too much logic in most computing courses.

#### 1.2 Professor A. Norcliffe

Professor Allan Norcliffe began by discussing the benefits of combined courses. The fact that nearly 40% of mathematics graduates go into computing as a profession should be reflected in our courses. A comment was that very few people see computing as an area of applied mathematics. He then discussed the relation between computing and mathematics and how the two can help to develop each other. He used the model of the software development process to illustrate this relationship. Amongst the benefits of joint degrees would be that they were accessible to a range of students, involved in an exciting and volatile area, facilitate the development of PSQ's, and might make sense to politicians and funding agencies.

#### 1.3 Professor M. Loomes

Professor Martin Loomes argued that mathematics grew out of computing and then computing grew out of mathematics. Perhaps the time has now arrived for a synthesis of the two. Should we acknowledge (or perhaps agree) that the two are simply different presentations of the same thing? The teaching of mathematics obscures the creative process and the desire of computing to be seen as engineering has obscured the connections between the two. We need to see a way to bring the two subjects together and one

problem is the way that the two subjects are treated in schools. Mathematics is seen as closed but computing is seen as technocentric.

#### 1.4 Professor T. Denvir

Professor Tim Denvir spoke from the view of the practising commercial computer scientist or, should we say, software engineer. Some of the issues that need to be considered are:

- (i) Where is mathematics needed in software engineering?
- (ii) Do employers recognize this?
- (iii) Do employers and colleagues support mathematical activity?

He also suggested that the following employers were interested in employing mathematically oriented computer scientists, possibly in order of their recognition of the importance of such people: engineering and scientific employers, software houses and the utilities, retail and financial houses.

## 2 The Discussion

It is very difficult to paraphrase in a coherent way the discussions of over 60 people. What I have tried to do is to pick out those issues which caught my attention. Professor Wilfrid Hodges began by highlighting the three areas which he thought we should focus on:

- (i) supply problems, i.e. issues to do with students;
- (ii) demand problems, i.e. issues to do with employers;
- (iii) internal problems, i.e. issues internal to Universities.

It is convenient to split this description up into a short summary of the things brought up under the various headings.

### 2.1 Supply problems

The fundamental problem here is how to attract good students to take these courses. How do we help them decide whether to take a joint Mathematics and Computer Science degree, or to take a single subject degree in Mathematics or

Computer Science? How do we persuade them that joint courses are of value? How do we persuade more women students to take them? Do we need to provide more fluid courses? How do we adapt to the changing skills of students? Having recruited them, how do we maintain their interest in mathematics? Many students don't seem to know what to expect in computer science courses when they get to universities. Many come with little rigorous training. However, lecturers with experience of sandwich courses find that students come back with increased commitment. Do we need to change the way we teach? Do mathematicians make mathematics too formal so that it ends up a bit too much like "Theology"? Many students feel that the maths ought to be, or even is, "useful". There is a feeling that maths puts students off, so why do students do the joint degrees that exist? One of the main reasons appears to be avoiding having to make a decision.

### 2.2 Demand problems

Mature students seem to recognise the need for joint courses in the real world. Is this a result of their job experience? One hears computer scientists labelled as "propeller heads" and "space heads"; does this attitude drive girls away from computer science? There was a sense in which the joint degree candidates will avoid some of these pitfalls and thus be more attractive to employers. We could develop the need to work in groups. But then the point was made that many employers are not very clear about their own needs. Perhaps our main task is to "train students to train themselves" and that, in a fast moving subject, this is what the employer really wants. Problem solving and the ability to communicate the solution is thought to be important to employers. There was a sentiment that you can't really teach problem solving; it tends to be puzzle solving. The idea of closed solutions to problems was misleading. The real question was, "Can you say something useful about this problem?". Perhaps more personal skills would be appreciated by the employers. However we should not become too concerned

with vocational courses. What these courses should be about was precision thinking and the ability to handle abstract thoughts.

### 2.3 Internal problems

The issues here are:

- (i) demarcation disputes;
- (ii) educating mathematicians to the needs of computer scientists;
- (iii) whether logic is the heart of Computer Science;
- (iv) non-numerical mathematics and how to teach it.

Why should computer scientists want to cooperate? They have plenty of students already; would a joint degree help them? Syllabus was the issue that caused most debate and, perhaps, was the most inconclusive. A number of points were made which it is difficult to summarize. Someone suggested that at the heart of the difference in attitude was that computer scientists teach things only as deep as they need to solve a problem but

that mathematicians teach things deeply enough to get to hard problems. (In fact, this is probably a universal feature of the the teaching of applications of mathematics, as opposed to pure mathematics.) Do you teach people how to think logically by teaching them logic? The view was that you probably don't, but then how do you? What about graphics and the range of mathematics needed for that? Are there generic skills which are needed by everybody, such as communication, and manipulating symbols?

**3 Conclusions** This is difficult to put into a few words. There seemed to be a strong view that joint courses should have academic viability and that there should be a demand from Industry and Commerce. It might be quite difficult to construct such courses and to sell them to prospective students. It was felt that a short booklet with the text of the main speakers' contributions and a summary of the discussion should be made available.

Alan Camina

=====  
This occasional column is for the discussion of topics on the boundary between mathematics and computer science, thus covering both applications of mathematics in computer science and uses of computers in mathematics. Relevant material such as opinions, notices about Maths & CS meetings and reviews of research, teaching and support software is solicited. Contributions should be sent to the editors of the column: w.hodges@qmw.ac.uk (Wilfrid Hodges, Queen Mary & Westfield College) dfh@maths.warwick.ac.uk (Derek Holt, University of Warwick).

## GEORGE GREEN MEMORIAL FUND

Books are available from the George Green Memorial Fund, c/o Professor L.J. Challis, Department of Physics, University of Nottingham, Nottingham NG7 2RD. Cheques should be made payable to the "George Green Memorial Fund".

*An Essay on the Application of Mathematical Analysis to the Theories of Electricity and Magnetism*, George Green, 1828. Bicentenary Edition, Nottingham, 1993, 78 pages, £5.00 including postage. Facsimile Edition of 1000 copies produced for Professor Ekelöf, Chalmers University Göteborg, 1958, 78 pages, hard-cover £25, soft-cover

£20.00. Both prices include postage.

*George Green, Mathematician and Physicist: The background to his life and work* (Athlone Press, 240 pages) D.M. Cannell. Members of scientific societies and others who participated in the Bicentenary Celebrations may buy this from the George Green Memorial Fund at the reduced price of £30.50 including postage (UK) or £31.50 including postage (overseas).

*George Green, Miller and Mathematician* (Nottingham Arts Department, 80 pages). D.M. Cannell, £2.50 including postage.



THE UNIVERSITY OF AUCKLAND  
NEW ZEALAND

## LECTURESHIP IN APPLIED & COMPUTATIONAL MATHEMATICS

Department of Mathematics  
School of Mathematical &  
Information Sciences  
(Vacancy UAC.401)

Applicants must have a Doctorate or equivalent and should have a proven record in teaching and research in some branch of Applied and Computational Mathematics. Applications are particularly welcome from candidates with expertise in fields that will strengthen the existing research interests of the Applied and Computational Mathematics Unit. These include differential equations, dynamical systems and bifurcation theory, inverse problems, numerical analysis.

Commencing salary per annum will be established within the range NZ\$37,440 - NZ\$49,088.

Further information, Conditions of Appointment and Method of Application should be obtained from Appointments (42635), Association of Commonwealth Universities, 36 Gordon Square, London WC1H 0PF (tel. 071 387 8572 ext. 206; fax 071 383 0368); or from the Academic Appointments Office, University of Auckland, Private Bag 92019, Auckland, New Zealand (tel. [64 9] 373 7999 Extn. 5097; fax [64 9] 373 7454). **Three copies** of applications should be forwarded to reach the Registrar by **20 May 1994**.

**Please quote Vacancy Number UAC.401 in all correspondence.**

The University has an EEO policy and welcomes applications  
from all qualified persons

## SET<sup>7</sup> A SUCCESS - OFFICIAL

The Minister for Science has announced that SET<sup>7</sup> was a success. More significantly, all the reports suggest that the people who attended the literally hundreds of events all over the UK would agree.

The Festival was planned to be a country-wide event, not concentrated on London. It turned out to be more decentralized than was intended, largely through the constraints of time and money. Local organizers were left very much to their own devices, and there was little if any advertising in the national media. Brian Gamble, who was put in

charge of the whole thing, has acknowledged that there was a lot going on that even the British Association knew nothing about. Fortunately, enough did happen locally, and thanks are due to all those who put in the time and effort to organize and publicize events in universities and colleges throughout the UK. Now that we know there will be a Festival next year, and have a bit of time to think about it, I would be grateful if anyone who has ideas about what we should (or should not) do would contact me while these are still fresh in their minds.

P.T. Saunders

## FERRAN SUNYER I BALAGUER PRIZE

The Institut d'Estudis Catalans has awarded the second Ferran Sunyer i Balaguer Prize to Klaus Schmidt for his monograph entitled *Dynamical Systems on Algebraic Origin*. The prize consists of 12,000 ECU. The monograph will be published in Birkhäuser Verlag's series "Progress in Mathematics". Each year, the

Ferran Sunyer i Balguer Prize will be awarded for a mathematical monograph of an expository nature presenting the latest developments in an active area of research in Mathematics, in which the applicant has made important contributions.

## The University of Liverpool Department of Pure Mathematics

### Senior Research Assistant

Applications are invited for a Senior Research Assistant to work with Dr H.R. Morton on invariants of knots and 3-manifolds and their inter- relations.

Applicants should have some knowledge of knot theory or 3-dimensional manifolds, and preferably some experience of computing and an acquaintance with representation theory. They should possess a Ph.D. in mathematics, or expect to receive such an award in the near future.

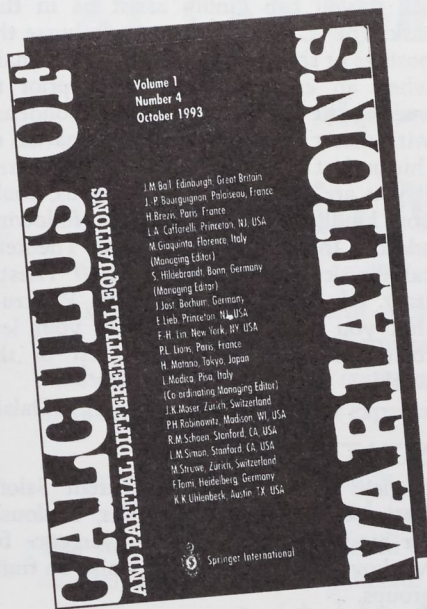
The post is funded by SERC and is tenable for up to three years, starting on 1 September 1994, or as soon as possible thereafter.

Initial salary is within the range £12,828 to £15,186 per annum.

Informal enquiries may be made to Dr Morton, 051-794 4070, e-mail: h.r.morton@liv.ac.uk.

Applications, quoting ref: B/265, together with the names of three referees, should be received not later than **25 May 1994**, by The Director of Personnel(B), The University, PO Box 147, Liverpool L69 3BX, from whom further particulars may be obtained. Late applications will be considered until the post is filled.

# Are you a regular reader?



## From the contents of Volume 1, 1993:

Asymptotics for the minimization of a Ginzburg-Landau functional  
Variational problems with free interfaces

Singular perturbations as a selection criterion for periodic  
minimizing sequences

The scalar curvature equation on 2- and 3-spheres

Finite time blow-up for the harmonic map heat flow

A proof of a logarithmic Sobolev inequality

Existence and convergence of positive weak solutions of  
 $-\Delta u = u^{n-2}$  in bounded domains of  $\mathbb{R}^n$ ,  $n \geq 3$

Weak limits of Palais-Smale sequences for a class of critical  
functionals

The Landau-Lifshitz equation of the ferromagnetic spin chain and  
harmonic maps

Intrinsic third derivatives for Plateau's problem and the Morse  
inequalities for disc minimal surfaces in  $\mathbb{R}^3$

Boundary regularity for minimizing currents with prescribed mean  
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## DONATION PROGRAMME

You may be aware that the International Centre for Theoretical Physics, initiated a project called "Donation Programme" to supply libraries of universities in least developed and developing countries with back issues of journals, and spare copies of Mathematics and Physics books and proceedings.

In the past we made appeals to libraries, individuals and publishing companies asking them to kindly donate any material they no longer needed with the ICTP acting as a broker. The response has been very encouraging. The needs of libraries in developing countries are very great. Our colleagues there suffer from lack of library facilities. As individuals they simply do not have the funds to purchase all the necessary books and pay the journal subscriptions. Clearly, without an adequate or

even a "minimum" library, scientists cannot keep abreast of scientific developments and the training of students is impossible.

I am therefore launching this appeal to ask if you can kindly assist us in this task. The ICTP is willing to reimburse the postage or shipping costs (via surface mail) when an estimate is provided prior to making the shipment. All correspondence with donor countries and co-ordination of this project are handled here at the Centre. If you are interested in helping us, could you kindly notify me at the following address: International Centre for Theoretical Physics, PO Box 586, 34100 Trieste, Italy, tel: 2240318, fax: 224559. We trust that you will be able to help your less fortunate colleagues in the rest of the world.

H.R. Dalafi

## ROLLO DAVIDSON TRUST

The Trustees of the Rollo Davidson Trust give notice that they have awarded Rollo Davidson Prizes for 1994 to Thomas S. Mountford (University of California at Los Angeles) for his work on interacting

particle systems, and to Laurent Saloff-Coste (Université Paul Sabatier, Toulouse) for his work on rates of convergence for Markov chains and random walks on finite groups.

## WORKSHOP ON GALOIS MODULES

The "Durham Workshop on Natural Representations of Galois Groups" will be held at the College of St Hild and St Bede, Durham University from 22 to 24 August 1994. The subject area will be based around (but not limited to) Galois Module Structure as studied by, for example, D.J. Burns, A. Frölich, T. Chinburg, J. Ritter and M.J. Taylor. These and several other principal investigators in the area have expressed their intention to attend.

The Workshop will receive support from the SERC and application has been made to the London Mathematical Society for additional funds.

Further information may be obtained from S.M.J. Wilson, Department of Mathematical Sciences, University of Durham, South Road, Durham, DH1 3LE. (fax: 091 374 3741, e-mail: S.M.J.Wilson@durham.ac.uk).

## PHYSICAL INTERPRETATIONS OF RELATIVITY THEORY

The fourth meeting to review "Physical Interpretations of Relativity Theory" is scheduled to take place in Imperial College, London, between Friday 9 September and Monday 12 September 1994. The meeting will open at 2.00 pm on Friday and close at 1.00 pm on Monday, though if the submission of papers justifies extending the programme, it will be lengthened to include the afternoon of Monday 12 September. The meeting is

sponsored by the British Society for the Philosophy of Science. Brochures stating objectives of the meeting and giving instructions about submission of abstracts, registration fees, accommodation etc., and Registration Forms, are obtainable from: Dr M.C. Duffy, School of Engineering and Advanced Technology, University of Sunderland, Chester Road, Sunderland SR1 3SD; tel: 091 5152856; fax: 091 5152703.



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# UNIVERSITY OF KENT

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## AT CANTERBURY ■ ■ ■ ■

Institute of Mathematics and Statistics

## Chair in Mathematics

As part of the development of the Institute of Mathematics and Statistics, the recently established Mathematics Group is appointing a new Professor of Mathematics. The present complement of the group is eleven members and there are good prospects for expansion.

Applications are invited from candidates who wish to play an important role in the consolidation and expansion of the new Mathematics Group. The successful applicant should have an excellent record of leadership in research and an ability to generate research income. Collaborative projects with the other parts of the Information Technology Faculty, comprising the Electronics and Computing Laboratories, will be encouraged. He or she will also be expected to make a major contribution to the development of the teaching of mathematics by the group. The Chair is available from 1st October 1994, and informal enquiries may be made to Professor Byron Morgan - Tel (0227) 764000, ext. 3013 (e-mail [bjtm@ukc.ac.uk](mailto:bjtm@ukc.ac.uk)), or Professor Alan Common, ext. 3664 (e-mail [akc@ukc.ac.uk](mailto:akc@ukc.ac.uk)). Following appointment to the Chair, a new Lectureship in Mathematics will be advertised.

Salary will be within the professorial range (minimum £30,398 p.a.)

Further particulars are available from the Personnel Office, University of Kent, Canterbury, Kent, CT2 7NZ. Tel: 0227 764000, ext. 3915 or 0227 475482 (24 hr. answerphone).

Please quote reference A94/68. Closing date: 30 June 1994.

*The University is committed to implementing its  
Equal Opportunities Policy.*



## THE WILKINSON PRIZE FOR NUMERICAL SOFTWARE

In honour of the outstanding contributions of James Hardy Wilkinson to the field of numerical software, Argonne National Laboratory, the National Physical Laboratory, and the Numerical Algorithms Group award a numerical software prize of US\$1000. The first prize was awarded to Linda Petzold for DASSL at the International Conference in Industrial and Applied Mathematics (ICIAM 91). The second prize will be awarded at ICIAM 95 in Hamburg, 3-7 July 1995.

**Rules for Submission** Each author of an entry must be under 40 years of age on 1 January 1995. Each entry must contain the following:

- Software written in a widely available high-level programming language.
- A paper describing the algorithm and the software implementation. The paper should give an analysis of the algorithm and indicate any special programming features.
- Documentation of the software which describes its purpose and method of use.
- Examples of use of the software, including a test program and data.
- A one or two page summary of the main features of the algorithm and software implementation.

Submissions must be in English. Entries must be received by November 1, 1994.

The King Faisal International Prize in Science (Mathematics) 1994 is awarded to Dennis P. Sullivan (USA), Albert Einstein Professor of Mathematics, City University of New York and Professor, Institut des Hautes Etudes Scientifiques, France. He is a member of the (American) Academy of Sciences, Fellow of the Academy of Arts and Sciences and was a Vice-President of the American Mathematical Society. Professor Sullivan began his career as a geometer with innovative and powerful work in algebraic topology. In recent years he has combined analytic and geometric methods to develop sound mathematical foundations for the study of complex dynamical systems and has made contributions to iteration theory

**Selection Criteria** The award will be made to the entry that best addresses all phases of the preparation of high quality numerical software, including

- clarity of the paper and software implementation and documentation;
- portability, reliability, efficiency and usability of the software implementation;
- depth of analysis of the algorithm and the software;
- importance of application addressed by the software; and
- quality of the test software.

Software can be submitted on 3.5-inch high density (1.44MB) diskettes, 1/4-inch cartridge tape (60MB or 150MB), 8mm cartridge tape (2GB), or sent by e-mail. Submissions should be in the form of a tar archive with a README file describing the contents of the archive. Makefiles for executing test programs must be included. Submissions can be sent by e-mail to [wilkinson\\_prize@mcs.anl.gov](mailto:wilkinson_prize@mcs.anl.gov), or to the Board of Trustees, Wilkinson Prize for Numerical Software, at one of the following two addresses: Argonne National Laboratory, Mathematics and Computer Science Division, 9700 South Cass Avenue, Argonne, Illinois 60439, USA or Numerical Algorithms Group Ltd, Wilkinson House, Jordan Hill Road, Oxford OX2 8DR, UK.

## KING FAISAL PRIZE 1994

and renormalization phenomena.

Sir Michael Atiyah received the first King Faisal Prize in mathematics in 1987. The science prize of 1991 was again attributed to mathematics, but not awarded. The next King Faisal Prize in mathematics is due in 1998 with nominations by 1 September 1996. Nominations can be made by scientific societies, universities and research centres. Nominees must have accomplished outstanding academic work. The submitted work must be original and published; it will not be accepted if it has been previously awarded a prize by any international organization. The nominations are evaluated by an international Selection Committee.



**O. HESSE**  
**Honorary Member 1871**

## DIARY

The diary lists Society meetings and other events publicized 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.

1994

MAY

- 6 Edinburgh Mathematical Society Meeting, Aberdeen (209)
- 13-14 Two-day London Mathematical Society Meeting, Leeds University
- 13-14 Group Theory Conference, University College Galway (215)
- 16-20 Groups and Geometry Conference, University of Auckland, New Zealand (212)
- 16-27 Workshop on Commutative Algebra and its Relation to Combinatorics and Computer Algebra, ICTP, Trieste, Italy (207)
- 18 Reading One-Day Combinatorics Colloquium, Reading University (215)
- 24-27 The Dynamics and Topology of Complex Analytic Maps, Professor R.L. Devaney, Adams Lecturer, Manchester University (214)
- 26 STATMECH-10, King's College London (215)
- 27 North British Functional Analysis Seminar, Edinburgh University (215)
- 31 Fermat's Last Theorem, Gresham Geometry Lecture, London (212)

JUNE

- 1-7 Algebraic Topology Conference, Barcelona, Spain (201)
- 4 Edinburgh Mathematical Society Meeting, St Andrews (209)
- 5-11 Workshop on Harmonic Analysis, Oscillatory Integrals & Applications to PDEs, ICMS, Edinburgh (210)
- 11-13 Summer Meeting of the Canadian Mathematical Society, Alberta University, Canada (215)
- 13-17 Elliptic & Parabolic Problems Conference, Pont-a-Mousson, France (204)
- 13-17 Hyperbolic Problems - Theory, Computations & Applications Conference, Stony Brook, New York, U.S.A. (204)
- 17 London Mathematical Society Meeting, London

JULY

- 1-11 Quantum Concepts in Space and Time, LMS Durham Symposia (211)
- 4-7 Conference on Nonlinear Dynamics and Pattern Formation in the Natural Environment, The Netherlands (210)
- 5-10 The Mathematical Theory of Phase Transitions Summer Workshop, Sussex University (214)
- 10-16 Combinatorial Geometry Euroconference, Anogeia, Greece (214)
- 11-15 Algebraic and Number Theoretic Aspects of Ergodic Theory Workshop, Warwick University (214)
- 11-16 Quantum Communication and Measurement Workshop, University of Nottingham (212)
- 11-22 Topological Methods in Differential Equations and Inclusions Seminar, University of Montreal Canada (212)
- 12-22 Geometry and Cohomology in Group Theory, LMS Durham Symposia (211)
- 15-16 W.N. Everitt Seventieth Birthday Meeting, Birmingham University (215)
- 17-23 Workshop on Elliptic PDE & related areas of Harmonic Analysis, ICMS, Edinburgh (210)
- 17-23 Actions of Lie Groups and Discrete Subgroups on Manifolds Euroconference, Anogeia, Greece (214)
- 18-22 Non-Standard Mathematics Colloquium, University of Avero, Portugal (212)
- 18-22 Workshop on Lattice Dynamics, Statistical Mechanics and Ergodic Theory, Warwick University (214)
- 20-22 International Symposium on Symbolic and Algebraic Computation, Oxford (213)
- 20-27 3rd Souslin Conference, Saratov, Russia (209)
- 25-29 Category Theory European Colloquium, France (213)
- 25-29 Evolution Equations Conference, University of Strathclyde (211)
- 26-30 Differential Geometry International Colloquium, University of Santiago de Compostela, Spain (210)

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 W1V 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.bay](mailto:lms@uk.ac.kcl.cc.bay).