THE LONDON MATHEMATICAL SOCIETY NEWSLETTER

No. 275 October 1999

FORTHCOMING SOCIETY MEETINGS

Friday-Saturday 15-16 October 1999 - London
New Applications of Twistor Theory
Friday 19 November 1999 - London
Annual General Meeting
J. Matoušek, W.T. Gowers

ANNUAL GENERAL MEETING

The Annual General Meeting of the London Mathematical Society will be held on Friday 19 November 1999 at 3.15 pm in the Chemistry Auditorium, Christopher Ingold Building, University College, 20 Gordon Street, London WC1. At the Meeting the report of the Treasurer will be read, the Council and Officers of the Society for the coming year will be elected, and Auditors appointed. The election of Council and Officers is governed by Article 9 of the Charter of the Society, by Articles 18, 24 and 31 of the Statutes of the Society, and by By-Law I of the By-Laws of the Society.

Members will recall that By-Law I was amended at the June meeting of the Society to allow the ballot to be held under the Single Transferable Vote system (see the May 1999 *Newsletter*). In addition the nominations for vacancies on Council will arise from the new Nominating Committee rather than from Council itself. The custom of circulating the ballot papers with the October issue of the *Newsletter* is being discontinued. There will instead be a special mailing of ballot papers in October; this will include details of the voting procedure and information about the candidates.

J.S. Pym
Council and General Secretary

ANNUAL DINNER

The 1999 Annual Dinner will be held after the Annual General Meeting on Friday 19 November at 6.30 pm for 7.00 pm at the Old Refectory, University College, London WC1. The cost is £26.25 per person and members may book places for guests. The booking form, enclosed with this *Newsletter*, should be returned together with payment to the London Mathematical Society office by **Monday 15 November.**

LMS JOURNAL OF COMPUTATION AND MATHEMATICS

Until the end of 1999, subscriptions to the purely electronic LMS Journal of Computation and Mathematics are free and the journal is accessible via http://www.lms.ac.uk/jcm. If members would like access to the journal after that date, they may order their subscription for the calendar year 2000 by completing the relevant parts of the membership subscription form enclosed with this *Newsletter*.

Payment of the subscription will provide access to the full archive of the journal (Volumes 1 - 3 in 2000) for a period of one calendar year, from 1 January to 31 December 2000. This is analogous to one year's 'rental' of the journal, and the usual conditions that apply to a subscription for personal use will also apply to the JCM,

should printed versions of the journal be made by the subscriber. Following registration, there will be approximately ten days delay before electronic access goes live.

Individual subscribers will be able to access the journal from any site via a username and password. This will be sent to the subscriber via e-mail and it is most important to complete the current e-mail details on the subscription form. Naturally, an additional condition of 'personal use' will be that only the individual subscriber may use the username and password assigned to them.

To view the journal before deciding on taking a subscription for 2000, please visit http://www.lms.ac.uk/jcm. New developments will be posted on the web pages of the journal and access to the index and abstracts will remain freely available to all.

Christopher Lance
Publications Secretary

ANNUAL SUBSCRIPTION

The LMS annual subscription, including publications, for the session November 1999 - October 2000 is due on 1 November 1999. Together with this *Newsletter* is a renewal form to be completed and returned with your remittance in the enclosed envelope.

No action is required if you are already paying by Direct Debit, and do not wish to change your choice of publications. Fully complete and return the form if you are paying by Direct Debit but wish to change your choice of publications or add/delete a subscription to the European Mathematical Society. Bank accounts of members paying by Direct Debit will be debited with the appropriate amount on 17 January 2000. Other members should either enclose a cheque (£ sterling or US$) with their form or, if they have a UK bank account and wish to take advantage of this convenient form of payment, request a Direct Debit mandate. Although the facility to pay by credit card is open to all members of the Society, it is our preference that members continue to pay by Direct Debit.

If the renewal form is missing from this *Newsletter*, contact the Society's Office (De Morgan House, 57-58 Russell Square, London WC1B 4HP, tel: 0171 637 3686, fax: 0171 323 3655, e-mail: lms@lms.ac.uk).

PUBLICATIONS PRICING POLICY

The London Mathematical Society has a pricing structure for its journals, which allows individual members to purchase them at a substantial discount. These discounted prices are intended for personal use only and the journals should be kept among your personal belongings and not deposited, even temporarily, in a library, common room or other public area. Issues of the journals should be accessible to other mathematicians or students only with your permission, given individually in each instance.

VISIT OF PROFESSOR J. MATOUŠEK

Professor Jiri Matoušek of Charles University (Prague) will be visiting Professor Imre Barany at University College London under a Scheme 2 LMS grant from November 15 to December 3. He is a leading expert in combinatorics, discrete geometry, and discrepancy theory. Professor Matoušek will give seminars at LSE, UCL, and Cambridge. He is one of the speakers at the LMS meeting on November 19. Dates and further details can be obtained from I. Barany (barany@math.ucl.ac.uk).

HONORARY DEGREES

Honorary degrees have been awarded to members of the London Mathematical Society in the past year:

Alan Baker	Strasbourg
David Crighton	UMIST
Andrew Wiles	Oxford
Sir Michael Atiyah	Heriot-Watt

The Editors would be glad to learn of the names of other recipients of honorary degrees.

LONDON MATHEMATICAL SOCIETY

TWO-DAY MEETING

Friday 15th and Saturday 16th October 1999

NEW APPLICATIONS OF TWISTOR THEORY

Friday

2.15 K. P. Tod (Oxford) *Twistors in a Lorentzian World*

3.30 M. G. Eastwood (Adelaide) *Involutive Structures in Twistor Theory*

4.30 Tea

5:00 N. J. Hitchin (Oxford) *Hyperkähler Geometry and Integrable Systems*

7:00 Dinner

Saturday

9:15 S. Merkulov (Glasgow) *Twistor Solution of the Holonomy Problem*

10:15 Coffee

10.45 L. J. Mason (Oxford) *Twistors and Integrability*

12:00 Sir Roger Penrose (Oxford) *The Physics Programme of Twistor Theory, especially General Relativity*

Lectures will be held in the Chemistry Auditorium, Christopher Ingold Building, Department of Chemistry, University College, 20 Gordon Street, London WC1.

Dinner will be held at Poons Restaurant, 50 Woburn Place, Russell Square, London WC1 on the Friday evening at 7.00 pm. The cost will be £20.50 per person, inclusive of wine, and a reception at De Morgan House beforehand. Those wishing to attend should inform Miss Susan M. Oakes, London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HP, enclosing a cheque payable to 'The London Mathematical Society' to arrive no later than Tuesday 12 October.

Some funds are available to contribute in part to the expenses of members of the Society or research students who wish to attend the meeting. Requests for support should be addressed to the Meetings and Membership Secretary, London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HP (requests should include an estimate of expenses and a very brief *curriculum vitae*; research students should include brief letters of endorsement from their supervisors).

INVARIANCE AND FACTORIAL MODELS

Peter McCullagh (University of Chicago)

An ordinary meeting organised by the Royal Statistical Society will be held on Wednesday 13 October at 5.00 pm at the RSS, 12 Erroll Street, London EC1Y 8LX, (tea 4.30 pm).

The definition of a factorial model is extended to designs in which two or more factors have the same set of levels. Factorial models are first characterized by invariance under selection of levels. When applied to homologous factors, this same property identifies the statistically interesting subspaces, many of which are specified by symmetry, rotation and additivity. A postscript version of the paper is available at http://www.amsta.leeds.ac.uk/~iand/rss/oct13.ps

RAE2001 (APPLIED MATHEMATICS) Conference of Professors of Applied Mathematics

There will be a special meeting of CPAM (Conference of Professors of Applied Mathematics) to discuss issues relating to RAE 2001, in particular the draft of the UoA 23 Panel's Assessment Criteria and Working Methods. Professor Baker, the Chairman of the Applied Mathematics Panel, has kindly agreed to host the meeting in Manchester on the afternoon of Wednesday 6th October 1999. The meeting will commence at 2 pm in Lecture Theatre 2-17 in the Mathematics Building, The (Victoria) University of Manchester. The Mathematics Building is on Oxford Road opposite the University Museum, 18 storeys high.

REPRESENTATIONS OF GROUPS AND ALGEBRAS SUMMER SCHOOLS

This is a series of four Summer Schools, supported by the TMR Programme of the European Union. The objective is to provide an efficient training for young researchers who are interested in new trends in representation theory. Each School will have two parts; it will start with a 'Compact Seminar', in which the young participants take the active role; this will be followed by a 'Workshop', with lectures by leading experts of the field. Two of these have already taken place; the remaining ones are:

Summer School 2000 'Geometry of quiver-representations and preprojective algebras'. Isle of Thorns, University of Sussex, UK, 10-17 September 2000. Theme: The use of algebraic geometry in representation theory. Topics will include degenerations of modules, the theorem of Kac, Young tableaux and Schubert calculus, geometry of preprojective algebras and quiver varieties. Organizers: K. Erdmann (Oxford; erdmann@maths.ox.ac.uk),Ch. Geiss (at present UNAM, Mexico), W.W. Crawley-Boevey (Leeds).

Summer School 2001 'Homological conjectures for finite-dimensional algebras'. Nordfjordeid, Norway, 12-19 August 2001 (preliminary). Theme: Certain homological conjectures will be studied, in particular the finitistic dimension conjecture and the (generalized) Nakayama conjecture. Topics will include resolutions and syzygies, homologically finite subcategories, geometric aspects, infinitely generated modules. Organizers: O. Solberg (Trondheim; oyvinso@math.ntnu.no), P. Axler (Bielefeld), H. Krause (Bielefeld). Scientific coordinator: K. Erdmann (Oxford; erdmann@maths.ox.ac.uk).

Young researchers (i.e. aged under 35) from the EU and associated countries are especially invited to participate. They can apply for full support both for travel and for their local expenses. The TMR programme wishes to encourage in particular researchers whose place of work is in a less-favoured region, and women researchers. For further details and application forms, see http://www.mathematik.uni-bielefeld.de/~sek/summerseries.html or contact the organizers or co-ordinator.

LONDON MATHEMATICAL SOCIETY

Spitalfields Day

Wednesday 13 October 1999

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

THEORIES OF THE EARLY UNIVERSE

10.00	Registration
10.30 - 11.30	A Guth (MIT) *Inflationary Cosmology*
11.30	Coffee
12.00 - 13.00	R Crittenden (DAMTP, Cambridge) *Probing Non-Gaussianity with the CMB*
13.00	Lunch at Wolfson Court (adjacent to the Institute)
14.30 - 15.30	A Lukas (Oxford) *"M" Theory Cosmology*
15.30	Tea
16.00 - 17.00	N Turok (DAMTP, Cambridge) *Instantons and the Beginning*
17.00 - 18.00	Wine Reception at the Newton Institute

These lectures are linked to the Isaac Newton Institute Programme on
Structure Formation in the Universe

Anyone interested is welcome to attend. Lunch will be provided at a fixed charge; please let Maureen Clark at the Institute know by **5 October 1999** if you intend to come, to help us plan for lunch (tel: 01223 331539; fax: 01223 330508; e-mail: m.clark@newton.cam.ac.uk). There are limited funds available to assist research students to attend: please apply by **5 October 1999** to Maureen Clark at the Institute. Scientific enquiries may be addressed to Professor Neil Turok, Isaac Newton Institute, 20 Clarkson Road, Cambridge CB3 0EH (e-mail: n.turok@newton.cam.ac.uk).

INTEGRABLE SYSTEMS IN DIFFERENTIAL GEOMETRY

The Mathematical Society of Japan sponsors an International Research Institute every year. The 9th MSJ-IRI in this series will be held at the University of Tokyo, from the 17 - 21 July 2000. There will be both plenary lectures and lectures in parallel sessions, focusing on the role of integrable systems in differential geometry. Contact Martin Guest (martin@comp.metro-u.ac.jp) or any member of the organising committee for further details. The members of the organising committee are: Takushiro Ochiai (Chairman) (University of Tokyo), Martin Guest (University of Rochester/Tokyo Metropolitan University), Mitsuhiro Itoh (University of Tsukuba), Reiko Miyaoka (Sophia University), Tohru Morimoto (Nara Women's University), Yoshihiro Ohnita (Tokyo Metropolitan University), Simon Salamon (Oxford University), Takeshi Sasaki (Kobe University), Chuu-Lian Terng (Northeastern University), Gudlaugur Thorbergsson (Cologne University).

INTERNATIONAL CONGRESS ON DIFFERENTIAL GEOMETRY

First Announcement

An International Congress on Differential Geometry will be held from 18 - 23 September 2000, in memory of Alfred Gray (1939-1998) in Bilbao (Spain) at the Departamento de Matemáticas, Facultad de Ciencias, Universidad del País.

Scientific Committee

Th. Banchoff (Brown University), J.P. Bourguignon (IHES), E. Calabi (University of Pennsylvania), S. Donaldson (Imperial College London), J. Eells (Cambridge University), S. Gindikin (Rutgers University), M. Gromov (IHES), O. Kowalski (Charles University Prague), M. Mezzino (University of Houston-Clear Lake), S. Novikov (Maryland University), M. Pinsky (Northwestern University), A. Ros (Universidad de Granada) S. Salamon (Oxford University), L. Vanhecke (Katholieke Universiteit Leuven/Lieven), J. Wolf (University of California-Berkeley).

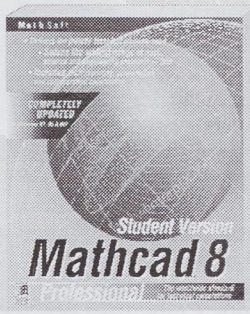
The International Congress will include various invited talks, several short communications, a poster session, a round-table discussion and a session with MATHEMATICA. Participation fee is 15,000 pesetas or US$100.00. The Scientific Committee reserves the right to select contributions for oral presentation. The address for correspondence is R. Ibáñez and M. Macho-Stadler, Departamento de Matemáticas, Facultad de Ciencias, Apartado 644, 48080 Bilbao, Spain (tel: 34-946015358 and 34-946015352, fax: 34-946012516, e-mail: Gray@lg.ehu.es). Further information about registration, conference fees, lodgings, submission of abstracts, programme of the conference, proceedings, and social activities, will be distributed by the organisers in the second announcement, before November 1999. All information is available on the web page (http://www.ehu.es/Gray).

THEODORE VON KÁRMÁN PRIZE

The Society for Industrial and Applied Mathematics (SIAM) has announced that it has awarded its Theodore von Kármán Prize for 1999 to John M. Ball of Oxford University and Stuart S. Antman of the University of Maryland. John Ball was honoured for his work on microstructure and the austenite-martensite transition and Stuart Antman was honoured for his work on viscosity of solids. The von Kármán Prize is awarded every five years for a notable application of mathematics to mechanics and/or the engineering sciences, made during the five to ten years preceding the award. The award may be given either for a single notable achievement or for a collection of such achievements. The members of the selection committee for the 1999 award were Phillippe Ciarlet, Joseph B. Keller and Jerrold E. Marsden (chair).

ERNEST L. ALBASINY

Mr Ernest L. Albasiny, who was elected a member of the London Mathematical Society on 12 October 1979, died on 18 July 1999.



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THE ALAN TURING MEMORIAL FUND

The Alan Turing Memorial Fund plans to commemorate the life and work of Alan Mathison Turing with a statue, by Glyn Hughes, to be placed in Sackville Park, Manchester. Funds are required to complete this project and if any member would like to be involved by way of making a donation or with additional information on the proposals, here are the names and telephone numbers of two people who can help: Alan Davies (tel: 0161 748 0810) and Richard Humphry (tel: 0161 477 2227). Mr Humphry is the Secretary to the Memorial Fund, of which Sir Derek Jacobi is the Patron, and the address is PO Box 4, Hayfield SK22 2FD (e-mail glynhughes @btinternet.com, web: www.btinternet.com/~glynhughes/turing.htm).

FERRAN SUNYER I BALAGUER PRIZE

Each year in honour of the memory of Ferran Sunyer i Balaguer, the Institut d'Estudis Catalans awards an international mathematical research prize bearing his name. The seventh Ferran Sunyer i Balaguer Prize was awarded to Patrick Dehornoy (University of Caen, France) for his monograph entitled Braids and Self-Distributivity. The prize consists of 1,800,000 ptas. The monograph will be published in Birkhäuser Verlag's series *Progress in Mathematics*. The Institut d'Estudis Catalans has announced the next competition. The competition is open to all mathematicians subject to the following conditions.

- The prize will be awarded for a mathematical monograph of an expository nature presenting the latest developments in an active research area in Mathematics in which the applicant has made important contributions.
- The monograph must be original, written in English, and of at least 150 pages; in exceptional cases, manuscripts in other languages may be considered.
- The prize, amounting to 10,000 euros, is provided by the Ferran Sunyer i Balaguer Foundation. The winning monograph will be published in Birkhäuser Verlag's series *Progress in Mathematics*, subject to the usual regulations concerning copyright and author's rights.
- The submission of a monograph implies the acceptance of all of the above conditions.
- The name of the prize-winner will be announced in Barcelona in April 2000.
- The winner of the prize will be proposed by a Scientific Committee consisting of: Professor P. Bayer (Universitat de Barcelona), Professor A. Córdoba (Universidad Autonoma de Madrid), Professor P. Malliavin (Université de Paris VI), Professor J. Oesterlé (Université de Paris VI), Professor A. Weinstein (University of California at Berkeley).
- Monographs should preferably be typeset in TeX; authors should send, before 5 December 1999, a hard copy and two disks with the DVI and PS files together with an accompanying letter to the Ferran Sunyer i Balaguer Foundation at the following address: Centre de Recerca Matematicà (IEC), Fundació Ferran Sunyer i Balaguer, Apartat 50, E-08193 Bellaterra, Spain (e-mail: crm@crm.es).

For further information on the Ferran Sunyer i Balaguer Foundation, see the web site (http://crm.es/info/ffsb.htm).

STOCHASTIC PROCESSES AND THEIR APPLICATIONS

The 27th Conference on Stochastic Processes and their Applications will be held from 9 to 13 July 2001 in the Centre for Mathematical Sciences, Cambridge. This will be a major international meeting under the auspices of the Bernoulli Society for Mathematical Statistics and Probability. For further information contact: James Norris (J.R.Norris@statslab.cam.ac.uk). Details on principal speakers and registration will be published in June 2000.

University of Nottingham
School of Mathematical Sciences

Lecturer in Pure Mathematics

Applications are invited for the above post available from 1 January 2000. This will be the fifth new appointment in the Pure Mathematics Division since January 1999, the others being to two Chairs and two Lectureships.

Candidates should have a strong commitment to high quality teaching, and have achieved an excellent research record or have outstanding research potential. The Division is keen to strengthen its analysis group, and candidates who work in analysis are strongly encouraged to apply.

Salary will be within the range £16,655 - £29,048 per annum (under review), depending on qualifications and experience.

Informal enquiries may be addressed to Professor J.E. Cremona, Head of Pure Mathematics Division (email: John.Cremona@Nottingham.ac.uk). Further details of the post and the Division's research activities are available on the WWW (http://www.maths.nott.ac.uk/personal/jec/detail.html).

Further details and application forms are available from the Personnel Office, Highfield House, The University of Nottingham, University Park, Nottingham NG7 2RD (tel: 0115 951 5927, fax: 0115 951 5205, email: Carole.Matthews@Nottingham.ac.uk). Please quote ref. LEG/470. Closing date: **8 October 1999**.

JOURNAL BACKLOG 1998/9

The London Mathematical Society thanks the editors of the journals for providing the following data listed below.

Susan Hezlet, Publications Manager

Journal	Number of issues per year	Number of pages per year	Backlog pages	Av. time from submission to acceptance months	Av. time from acceptance to publication months
Bull. London Math. Soc.	6	672	100	6	6
European J. Appl. Math.	6	720	290	3 - 4	3 - 4
Glasgow Math. J.	3	480	140	20 - 22	19
IMA J. Appl. Math.	6	600	100	6 - 8	6 - 8
IMA J. Numer. Anal.	4	660	330	20	10
Inverse Problems	6	1850	0	3.9	3.8
J. Fluid Mech.	24	9000	300	6 - 16	4 - 7
J. London Math. Soc. (2)	6	2112	1250	6	14
J. Phys. A	50	10000	0	3.6	2.1
LMS J. Comput. Math. (electronic)	N/A	200	0	6.5	2.5
Math. Proc. Cambridge Philos. Soc.	6	1200	300	3 - 4	10 - 11
Mathematika	2	440	150	15 - 27	
Nonlinearity	6	1850	0	6.6	2.9
Proc. Edinburgh Math. Soc.	3	636	350	6 - 8	12 - 18
Proc. London Math. Soc. (3)	6	1440	500	9	13
Proc. Roy. Soc. London Ser. A	12	2640	636	6	6
Quart. J. Math. Oxford Ser. (2)	4	512	384	10	10
Proc. Roy. Soc. Edinburgh Sect. A	6	1344	896	3 - 6	14

GRESHAM COLLEGE GEOMETRY

During the 1999 Autumn Semester three Public Lectures in Geometry will be given by Professor Sir Roger Penrose (Gresham Professor of Geometry).

Wednesday 20th October at 1.00 pm	'The Magical Complex Numbers'
Thursday 18th November at 1.00 pm	'Quantum Entanglements'
Thursday 2nd December at 5.30 pm	'Finite Geometry'

The first two lectures will be delivered at Gresham College, Barnard's Inn Hall, Holborn, London EC1N 2HH and the third one will be given at Dyne House Auditorium of Highgate School. Admission to the lectures is free and without tickets. Further details can be obtained from Gresham College (tel: 0171-831 0575; fax: 0171-831 5208; e-mail: enquiries@gresham.ac.uk; web site: http://www. gresham.ac.uk).

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London Mathematical Society Students Texts, 45

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HYPERBOLIC PROBLEMS CONFERENCE

A conference will be held at the Otto-von-Guericke University, Magdeburg, Germany on the subject of Theory, Numerics and Applications of Hyperbolic Conservation Laws and Related Fields, to take place from 28 February to 3 March 2000. The meeting is organized by G. Warnecke and H. Freistühler.

Scientific Committee:
J. Ballmann, A. Bressan, C. Dafermos, B. Engquist, M. Feistauer, H. Freistühler, J. Glimm, L. Hsiao, R. Jeltsch, P. Lax, T.-P. Liu, P.Marcati, D. Marchesin, K.W. Morton, B. Perthame, D. Serre, E. Tadmor, A. Tveito, and G. Warnecke.

Plenary Speakers:
- Yann Brenier (Paris)
- Thomas Hou (Pasadena)
- Shuichi Kawashima (Fukuoka)
- Ingo Mueller (Berlin)
- Alfio Quarteroni (Lausanne)
- Phil Roe (Ann Arbor)
- Giovanni Russo (L'Aquila)
- Steve Schochet (Tel Aviv)
- Joel Smoller (Ann Arbor)
- Michael Struwe (Zürich)
- Kevin Zumbrun (Bloomington)

Invited Speakers:
- François Bouchut (Orleans)
- Suncica Canica (Houston)
- Pierre Degond (Toulouse)
- Eduard Feireisl (Prague)
- Emmanuel Grenier (Lyon)
- David Hoff (Bloomington)
- Shi Jin (Atlanta)
- Kenneth H. Karlsen (Bergen)
- Smadar Karni (New York)
- Claus-Dieter Munz (Stuttgart)
- Benedetto Piccoli (Salerno)
- Bradley Plohr (Stony Brook)
- Ed Seidel (Potsdam)
- Tao Tang (Hong Kong)
- Eleuterio Toro (Manchester)
- Cheng-Chin Wu (Los Angeles)
- Tong Yang (Hong Kong)
- Shi-Hsien Yu (Osaka)

Detailed information can be found at the conference web page (http://rubens.math.uni-magdeburg.de/~hyp2000). Alternatively, send an e-mail to: hyp2000@ mathematik.uni-magdeburg.de, or a fax to HYP-2000 at +49-391-67-18073,or a letter to: HYP-2000, c/o Institut fuer Analysis und Numerik, Otto-von-Guericke-Universität Magdeburg, PSF 4120, D-39016 Magdeburg, Germany, in order to have all information sent to you by e-mail, fax, or regular mail.

EDINBURGH MATHEMATICAL SOCIETY 1999-2000

Meetings to be held by the Edinburgh Mathematical Society are:

1999

22 Oct (Edinburgh)	AGM and Presidential Address: Dr C. Maclachlan
19 Nov (Glasgow)	Professor C. Bardos
10 Dec (Heriot-Watt)	Professor D. Vassiliev

2000

14 Jan (Edinburgh)	Professor M. Ainsworth
11 Feb (Edinburgh)	Dr U.L. Tillmann
10 Mar (Dundee)	Dr P.K. Maini
5 May (Stirling)	Dr J.F. McKee
2 June (St Andrews)	Professor G.A. Margulis

For further information contact the Meetings Secretary, Philip Heywood, Department of Mathematics and Statistics, University of Edinburgh, Mayfield Road, Edinburgh EH9 3JZ (philip@maths.ed.ac.uk).+

The University of Leeds

SCHOOL OF MATHEMATICS

TWO LECTURESHIPS IN PURE MATHEMATICS

Applications are invited for two permanent Lectureships in the Department of Pure Mathematics, tenable from 1 January 2000 or as soon as possible thereafter.

The Department (one of three departments: Pure Mathematics, Applied Mathematics and Statistics, constituting the School of Mathematics at Leeds) was rated 5 in the last UK Research Assessment Exercise, and maintains strong research groups in Algebra, Analysis, Differential Geometry and Mathematical Logic. The successful candidates will have proven research records in one of these areas and will contribute to the high quality research and teaching of the School. For one of the appointments, preference may be given to candidates with interests in Noncommutative Algebra. The posts are part of a major development which aims to enhance the School's excellent reputation in research and teaching: in the recent QAA subject review it was awarded 22 points.

Salary will be on the scale for Lecturer 'A' (£17,238-22,579) according to qualifications and relevant experience.

Applications, including a curriculum vitae, publications list and the names of three referees, should be sent to Professor S.S. Wainer, Head of the Department of Pure Mathematics, University of Leeds, Leeds LS2 9JT, UK, by **29 October 1999.**

Informal enquiries may be made to Professor S.S. Wainer (e-mail: s.s.wainer@ leeds.ac.uk), or to Professor J.C. McConnell (e-mail: j.c.mcconnell@leeds.ac.uk), Department of Pure Mathematics, University of Leeds, Leeds LS2 9JT, UK (tel: (0)113 2335140, fax (0)113 2335145).

Application forms and further particulars may be obtained from Human Resources, The University of Leeds, Leeds LS2 9JT, tel. (0)113 2335775 (textphone for deaf applicants only: (0)113 2334353), e-mail: J.Byron@adm.leeds.ac.uk or from http:// www.leeds.ac.uk/jobadverts/

Further details of all the School's activities can be found on http://www.amsta.leeds.ac.uk

Towards Equal Opportunities

Isaac Newton Institute for Mathematical Sciences
Cambridge, UK

Newton Institute-ESF Conference

NON-FERMI LIQUID EFFECTS IN METALLIC SYSTEMS WITH STRONG ELECTRONIC CORRELATION

Organisers: D.M. Edwards; P.B. Littlewood; H. von Loehneysen

5 - 8 January 2000

This conference will initiate the Newton Institute research programme *"Strongly Correlated Electron Systems"* and is organized in conjunction with the European Science Foundation programme "Fermi-liquid instabilities in correlated metals" (FERLIN) (details at: http://www.esf.org/ferlin).

Scope of the Conference: Metals are usually described within Fermi-liquid theory. However, this description is sometimes found to break down when the interaction between electrons dominates their motion so that they become strongly correlated. New theories are being developed to describe such non-Fermi-liquid effects. The main aim of this conference is to confront theory with new experimental data covering a wide range of situations and materials where such effects occur. Specific cases to be discussed include:

- high temperature superconductors
- heavy fermion materials near quantum critical points
- fractional quantum Hall effect
- low dimensional systems

Speakers (already confirmed): J.-C. Campuzano, P. Chaikin, A. Chubukov, P. Coleman, J. Flouquet, A. Freimuth, A. Georges, S. Girvin, A. Gogolin, G. Lonzarich, A. Millis, J. Nicholls, B. Rainford, N. Read, J. Smet, F. Steglich, O. Stockert, P. Woelfle.

Location and Costs: The conference will take place at the Newton Institute and accommodation for participants will be provided at Wolfson Court, adjacent to the Institute. The conference package costs £260, which includes registration fee, accommodation for four nights, a welcome buffet on Tuesday evening, 4 January, and all meals up to lunch on Saturday 8 January, when the conference ends. Limited financial support may be available to young researchers from EC countries. The conference will be restricted to about 80 participants.

Applications: Application forms and further details are available from the WWW at: http://www.newton.cam.ac.uk/programs/scew01.html. Completed application forms should be sent to Maureen Clark at the Newton Institute or via e-mail (m.clark@newton.cam.ac.uk). Closing date for the receipt of applications is **30 October 1999**.

Offers of posters (numbers will be limited) with title and short (<10 lines) abstract should be sent to D.M. Edwards by **30 October** via e-mail (d.edwards@ic.ac.uk).

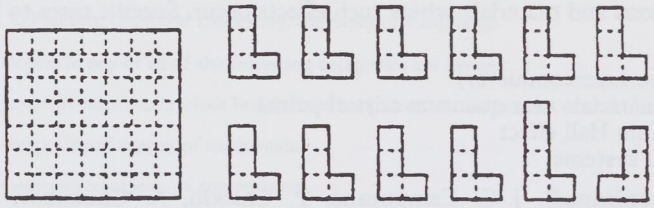
A Sampler from The Mathemagician and Pied Puzzler

The hostess, at her 20th wedding anniversary party, tells you that the youngest of her three children likes to pose this problem, and proceeds to explain: "I normally ask guests to determine the ages of my three children, given the sum and product of their ages. Since Smith missed the problem tonight and Jones missed it at the party two years ago, I'll let you off the hook."

Your response is, "No need to tell me more, their ages are ..."

From *Puzzles Around the World*, Richard I. Hess

Cover the 7 x 7 square with the 12 L-shaped pieces. You are not allowed to turn over any of the pieces, but you may rotate them in the plane.



From *Creative Puzzle Thinking*, Nob Yoshigahara

A 10% discount on your order for *The Mathemagician and Pied Puzzler* is your reward for a correct solution to one of these puzzles!

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Computer Algebra Systems - A Practical Guide Edited by Michael J. Wester, John Wiley & Sons, 1999, 436 pp, £65.00, ISBN 0-471-98353-5

In the main, this is not a book about computer algebra, but a book about CAS's (computer algebra systems). The Editor has collected together contributions from 19 authors whose interests in computer algebra systems vary quite widely. As the Editor states in the introduction, however, the best way to regard this 436 page volume is as "a computer algebra bestiary".

Of the 17 Chapters, 10 provide potentially interesting (and sometimes extremely detailed) comparisons of how each of the main commonly available CAS packages performs on various different types of problem. Chapter 1 gives details of the various systems and compares execution times for a test suite of problems. Chapter 3 performs a similar exercise using a very comprehensive range of test problems, some of which are extremely involved. A few of the chosen problems (for example, recognizing that $\sqrt[5]{41 + 29\sqrt{2}}$ simplifies to $1 + \sqrt{2}$) defeated every system. Some "comparison" chapters are more specialised; Chapter 6 compares the capabilities of CAS's for computing Chebyshev polynomials and Chapter 7 deals with equation-solving capabilities, citing some fiendish examples. In Chapter 8 relative system performance in solving polynomial systems is reviewed, Chapter 9 deals with symbolic limit computation, Chapter 11 with solution of ordinary differential equations and Chapter 12 with integrability tests for nonlinear evolution equations. Code generation performance is evaluated in Chapter 13, concentrating on Fortran and C. Finally, the question of expression evaluation is discussed in Chapter 14. All of these comparisons will be of interest either to anybody who is trying to decide which of the major systems to buy, or to those who already use a CAS and want to know if any of the other systems can succeed where their own fails! Inevitably, few of the comparisons produce a definitive recommendation regarding which system is "best", and strangely most of the authors seem a little reluctant to express their own preferences.

Not all the contributions to this volume are devoted to the task of CAS performance comparison. Chapter 4 gives a clear, concise and easy-to-read introduction to the subject of root denesting. Why might a CAS want to have this capability? Granted, it is satisfying to know that $\sqrt{5 + 2\sqrt{6}} = \sqrt{2} + \sqrt{3}$, but does this simplification serve any really useful purpose? It turns out that, apart from producing "nice simple" expressions, nested expressions can lead to severe losses of accuracy during numerical evaluation. Chapter 5 is devoted to the thorny problem of complex analysis for CAS's and is brief but very interesting. How well do most systems know their branch cuts? As anybody who has used a CAS will know, the answer is "not very well" . We have to be clear what we expect, however. When I am setting Fourier series questions for second year Engineers, I scoff at any system that "messes me about" by refusing to simplify $\sqrt{z^2}$; when I use the same system for research, however, I deride it for failing to realise that $\log(e^z) - z$ may not be zero when z is complex. This chapter gives a good idea of what we might reasonably require of an "intelligent" CAS.

The book also contains material on other aspects of CAS's. Chapters 10 and 15 deal with the place of the CAS in Mathematics Education, whilst Chapter 16 tells the interesting tale of how Babbage's original "Analytical Engine" can properly be thought of as the first real CAS. Finally, Chapters 17 and some appendices provide some general material pertaining to CAS availability and research.

It is clear that the Editor gave a fairly general brief to his contributors, for the articles in this book vary quite widely in nature; anybody who is interested in CAS's will find material of interest in this book. My only worry is that the pace of

change in the CAS business may mean that some of the articles soon become out of date.

Alistair Fitt
University of Southampton

Modern Computer Algebra J. von zur Gathen & J. Gerhard, Cambridge University Press, 1999, 753 pp, £29.95, US$59.95, ISBN 0-521-64176-4

This is not a book about computer algebra packages, but a book about computer algebra. It is a densely-packed volume, running to some 750 pages. In spite of its length however it is a most fascinating and readable survey of methods that are used by modern Computer Algebra Systems (CAS's).

For too long many of the Pure Mathematicians that I know shied away from computers, considering them to be basically inaccurate, unrigorous and generally the work of the devil. One can understand their point of view. The development of CAS's has changed this. It is a happy accident that many of the operations that one wants a good CAS to be able to perform can only be made to work in a sensible fashion after the problem has been treated with a large dose of classical pure mathematics. It also seems to happen rather often that the mathematics involved is novel and extremely pretty. This book is divided into 5 sections, whose titles bear the names of Euclid, Newton, Gauss, Fermat and Hilbert. Each of the algorithms that is dealt with is intimately associated with one of these mathematical giants. The tools of the trade include group, ring, module and field theory, number theory, and many other classical mathematics disciplines.

The material is explained in a readable and self-contained manner; in deference to the non-expert, all of the necessary definitions are present. The material is thus "self-contained" and this makes it possible for the reader to start anywhere in the book. The tone of the material and the cleverness that underlies some of the most efficient CAS algorithms is best illustrated by an example. How might we find the GCD of two polynomials? The answer to this is known; Euclid's algorithm works fine. There is a problem though; a naive application of Euclid's algorithm can often lead to calamitous "intermediate expression swell". The cure for this is elegant: we simply proceed using arithmetic mod p where p is a prime, and then use the Chinese remainder theorem to "lift" the answer back to the integers. The catch is that sometimes this gives the wrong answer! Does this matter? Not really, since such cases are "rare" . Of course, the details of how to deal with "unlucky" cases are rather involved; full details of this and a number of other very cunning algorithms are given. Even seemingly simple problems such as how fastest to multiply together two nth degree polynomials lead to absorbing mathematics; the standard high school method uses $O(n^2)$ operations, Karatsuba improved this to $O(n^{1.59})$, but Schonhage and Strassen trumped everybody by discovering a method that used only $O(n \log n \log\log n)$ operations!

Quite apart from the very interesting and approachable pure mathematics that the book contains, copious (often colour) illustrations, applications and examples are also provided. Each chapter ends with a series of notes that themselves make fascinating reading.

The book also contains a very comprehensive bibliography and includes a large number of carefully considered exercises, which range in difficulty from rather simple applications of the theory (which could easily be used in, say a Master's level course) through practical illustrations (example 24.7 begins "buy six plumbing knees at your local hardware store.....") to problems of a research nature.

This book is a delight; I heartily recommend it (a) to anybody who has any interest at all in how their CAS works and (b) to anybody who enjoys seeing elegant and rigorous mathematics applied to practical problems.

Alistair Fitt
University of Southampton

THE INSTITUTE OF MATHEMATICS AND ITS APPLICATIONS

FORTHCOMING CONFERENCES

SEVENTH CRYPTOGRAPHY AND CODING
The Royal Agricultural College, Cirencester 20 - 22 December 1999

THIRD MATHEMATICAL EDUCATION OF ENGINEERS
Loughborough University 26 – 28 April 2000

COMPUTATIONAL CHALLENGES FOR THE MILLENNIUM
Cambridge 13-14 July 2000

NINTH MATHEMATICS OF SURFACES
Cambridge 4 – 6 September 2000

THIRD QUANTITATIVE MODELLING IN THE MANAGEMENT OF HEALTH CARE
University of Salford, 5 – 7 September 2000

SECOND INTERNATIONAL BOUNDARY INTEGRAL METHODS: THEORY AND APPLICATIONS
University of Bath 11 – 15 September 2000

SHORT COURSE AND THIRD IMAGING AND DIGITAL IMAGE PROCESSING: MATHEMATICAL METHODS, ALGORITHMS AND APPLICATIONS
De Montfort University, Leicester 12-15 September 2000

SHORT COURSE AND FIRST FRACTAL GEOMETRY: MATHEMATICAL TECHNIQUES, ALGORITHMS AND APPLICATIONS
De Montfort University, Leicester 19-22 September 2000

FIFTH MATHEMATICS IN SIGNAL PROCESSING
University of Warwick 18 - 21 December 2000

FOURTH MATHEMATICAL MODELS OF MAINTENANCE
University of Salford 9-11 April 2001

THIRD SPATIAL PATTERNS IN PERMEABLE ROCKS
Churchill College, Cambridge 27 - 29 March 2000

✂ .....

To: Mrs Pamela Bye, Conference Officer, The Institute of Mathematics and its Applications, Catherine Richards House, 16 Nelson Street, Southend-on-Sea, Essex, SS1 1EF.
Tel: (01702) 354020 Fax: (01702) 354111
Email: conferences@ima.org.uk World Wide Web: http://www.ima.org.uk

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Honorary Member 1967

DIARY

The diary lists Society meetings and other events publicized in the *Newsletter*. Further information can be obtained from the appropriate LMS Newsletter whose number is given in brackets. A fuller list of meetings and events is given in the Society's web site (http://www.lms.ac.uk/meetings/diary.html).

OCTOBER 1999

6 Conference of Professors of Applied Mathematics, Manchester University (275)
9 Representations of Algebraic Groups and Related Topics meeting in honour of Roger Carter's 60th Birthday, Warwick University (274)
13 Theories of the Early University, Spitalfields Day, Isaac Newton Institute, Cambridge (275)
13 Invariance and Factorial Models Meeting, Royal Statistical Society, London (275)
15-16 Two-day LMS Meeting, New Applications of Twistor Theory, London (275)
18-22 Godunov Methods Theory and Applications Conference, Oxford University (274)
22 Edinburgh Mathematical Society Meeting, Edinburgh University (275)

NOVEMBER 1999

2 - 5 Hilbert's 10th Problem, Relations with Arithmetic and Algebraic Geometry Workshop, Gent University, Belgium (271)
19 LMS Meeting - Annual General Meeting, London
19 Edinburgh Mathematical Society Meeting, Glasgow University (275)
20 Belfast Functional Analysis Day, Belfast University (274)

DECEMBER 1999

10 Edinburgh Mathematical Society Meeting, Heriot-Watt University (275)

JANUARY 2000

5-8 Non-Fermi Liquid Effect in Metallic Systems Conference, Isaac Newton Institute, Cambridge (275)
14 Edinburgh Mathematical Society Meeting, Edinburgh University (275)

FEBRUARY 2000

4-6 Meeting in Honour of David Burgess's 60th Birthday, Nottingham University (274)
11 Edinburgh Mathematical Society Meeting, Edinburgh University (275)
28 Feb -3 Mar Hyperbolic Problems Conference, Magdeburg, Germany (275)

MARCH 2000

10 Edinburgh Mathematical Society Meeting, Dundee University (275)
20-24 LMS Invited Lectures: The Geometry of Isomonodromic Deformations (B. Dubrovin), Mathematical Institute, Oxford

APRIL 2000

11-14 Differential Geometry Workshop, Leeds University (274)
17-20 British Mathematical Colloquium, Leeds University

MAY 2000

5 Edinburgh Mathematical Society Meeting, Stirling University (275)

JUNE 2000

2 Edinburgh Mathematical Society Meeting, St Andrews University (275)

JULY 2000

3-7 Functional Analysis Meeting, Technical University, Valencia, Spain (265)
10-14 3rd European Congress of Mathematics, Barcelona, Spain (272)
10-14 Free Surface Flows IUTAM Symposium, Birmingham University (272)
17-21 Integrable Systems in Differential Ceometry, Tokyo, Japan (275)
17-22 International Congress of Mathematical Physics, Imperial College, London (257)

SEPTEMBER 2000

10-17 Geometry of Quiver-Representations and Preprojective Algebras Summer School, Isle of Thorns, Sussex University (275)
18-23 Differential Geometry International Congress, Bilbac, Spain (275)

APRIL 2001

9-12 British Mathematical Colloquium, Glasgow University

JULY 2001

9-13 Stochastic Processes and their Applications Conference, Cambridge (275)

AUGUST 2001

12-19 Homological Conjectures for Finite-Dimensional Algebras Summer School, Nordfjordeid, Norway (275)

AUGUST 2002

20-28 ICM2002, Beijing, China (272)

The Newsletter is published monthly except in August. Items and advertisements for inclusion in the Newsletter should be sent to the Editor, Susan Oakes, by e-mail, fax or post to the LMS office (addresses below), to arrive before the first day of the month prior to publication.

The London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HP
Tel: 020 7291 9977 fax: 020 7323 3655, e-mail: lms@lms.ac.uk.
World Wide Web: http://www.lms.ac.uk/

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