# THE LONDON MATHEMATICAL SOCIETY NEWSLETTER

No. 262 July 1998

## FORTHCOMING SOCIETY MEETINGS

*Friday-Saturday 16-17 October 1998 - London*
Harmonic Analysis
*Friday 20 November 1998 - London*
Annual General Meeting
L.C. Evans, J.M. Ball (Presidential Address)
*Friday-Saturday 12-13 February 1999 - Leeds*
Proof and Computation
*Friday-Sunday 14-16 May 1999 - Brussels*
Joint meeting with the Belgian Mathematical Society

## LMS COUNCIL DIARY

The Council meeting held on 15 May 1998 was the first to take place in De Morgan House (after exhaustive enquiries, the Administrator has produced definitive evidence of the correctness of the capitalized 'De', a question which could have plagued several Council meetings). Quite a bit of the meeting was taken up with discussion of new LMS staff. As reported in previous Newsletters, and elsewhere in this issue, the Society decided last year that it was necessary to take on more administrative staff to assist the Officers (all of whom are full-time academics). Now that we have the space in which to house them, we have begun to fill these posts, and all the appointments are likely to have been made by the time this diary is in print.

Another issue, which has been discussed on several occasions, is the accountability of the LMS to its members. Mathematics in the UK has changed a lot since the founding of the Society in 1865, particularly so in the last 50 years. While the Society has changed a lot too, there are several issues it needs to continue to address: one is the extent to which it represents the interests of those of its members who are applied mathematicians. Another is the question of whether it be more democratic in the way it conducts its business. Of course these are not separate issues. Elsewhere in this *Newsletter* is an article on democracy in the new LMS. This was presented at the Council meeting, although the discussion was remarkably short - perhaps because of a general feeling that this was something for the membership to be consulted about, not imposed from above. Please read it and make your views known - this is your chance to shape the way the Society is run in the future.

The Librarian reported that the Society had just purchased from the University of Aston a collection of mathematical books, formerly the property of G.H. Hardy. These are of mathematical as well as historic interest, and will in due course be rehoused so that they can be freely consulted.

Tony Scholl

## NEW LMS APPOINTMENTS

In the last month the following appointments have been made:

Dr D.J.H. Garling of the University of Cambridge has been appointed Executive Secretary. Ben will take up this part time post on 1st October while continuing part time as Reader in Mathematics at Cambridge.

Ms Susan Hezlet has been appointed as Publications Manager whose responsibility will be to oversee the management of our journal and book series. Susan will begin on 1st September. She presently works for Springer-Verlag.

Mr Ephrem Belay has been appointed as Accounts/Administrative Assistant. His main responsibility will be the accounts and membership. Ephrem began on 26th May. He previously worked for Workforce.

Mr Nilesh Shah has been appointed as Systems Network Manager (part time - 2 days a week). He will manage the Society's computers at De Morgan House and in Warwick, and help the Society's staff and officers in electronic matters. Nilesh began on 1st June.

These are in addition to the existing staff whom you already know: Miss Susan Oakes, Administrator; Ms Harvinder Lotay, Assistant Administrator (part time) and Mrs Sylvia Daly, Secretarial Assistant (part time).

## LMS 1998 HONORARY MEMBER

Professor Stephen Smale has been elected an Honorary Member of the London Mathematical Society. A full citation will appear later in the *Bulletin*. He is a mathematician with deep insight and vision who has made outstanding contributions in many areas of mathematics and its applications including differential topology, dynamical systems, non-linear analysis, geometric mechanics, mathematical economics and the theory of computation. His many achievements include the proof of the Generalized Poincaré Conjecture in dimensions greater than four, and also his highly influential work on dynamical systems and chaotic behaviour, typified by his construction of the solenoidal and horseshoe mappings and their associated systems. He has spent most of his mathematical career at the University of California at Berkeley, and is currently Distinguished University Professor at the City University, Hong Kong. He is a Fields Medallist and has also been awarded the US National Medal of Science.

## LMS SYMPOSIUM

The London Mathematical Society is supporting a symposium on "Modelling and control of infinite-dimensional systems". This will take place at the University of Leeds from 2 to 12 September 1998. Further information is available from the organizers, Jonathan Partington, Leeds (J.R.Partington@leeds.ac.uk) and Stuart Townley, Exeter (townley@maths.ex.ac.uk).

## GYÖRGY I. TARGONSKI

Professor György I. Targonski, who was elected a member of the London Mathematical Society on 15 December 1996, died on 10 January 1998, aged 70.

## LMS MEETING & RECEPTION INTERNATIONAL CONGRESS OF MATHEMATICIANS

The London Mathematical Society will be holding a Meeting and Reception, for its members, during ICM'98 at 6.30 pm on Friday 21 August at the Hotel Excelsior, Berlin. Members who wish to attend should apply for their free ticket to the Administrator, London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HP (e-mail: lms@lms.ac.uk) no later than 24 July. The Society hopes to entertain as many as possible of its members who are attending the Congress, but numbers are limited by the capacity of the room.

# LONDON MATHEMATICAL SOCIETY

# INVITED LECTURE SERIES

## Professor Alexander Mielke (Hanover)

## Tuesday 6th - Friday 9th April 1999
## University of Bath

# REDUCTION METHODS FOR DIFFERENTIAL EQUATIONS

**Abstract**

Ordinary and partial differential equations near steady states can often be reduced to equivalent but more accessible problems using implicit-function-theorem-type arguments. Often reduction is to finite-dimensional problems but sometimes, as in the case of Ginzburg-Landau theory, it leads to another partial differential equation.

Professor Mielke will present a unified treatment of these approaches, which include Lyapunov-Schmidt procedures, invariant manifold theory, centre manifolds and amplitude equations (as in Ginzburg-Landau theory).

These Invited Lectures, which are open to all, will be valuable for Research Students, and the LMS has provided funds to help support postgraduates who attend. It intends in each case that up to half the costs can be met, and it expects that the other half should be met by the student's department from RTSG or other funds. The fund will however be administered flexibly as needs dictate.

For further details contact: Professor John Toland, Department of Mathematical Sciences, University of Bath, Bath BA2 7AY (jft@maths.bath.ac.uk).

## MEETING OF THE SOCIETY

A meeting was held on Friday 22 May and Saturday 23 May 1998 at the Scientific Societies' Lecture Theatre, New Burlington Place, Professor J.M. Ball, FRS, President, in the Chair. There were present about 60 members and visitors for all or part of the meeting.

Eleven people were elected to Ordinary Membership: A.N. Alsolbi, K.M. Buzzard, G. Delius, K.J. Edwards, S.B. Kuksin, S.A. Pope, G.J. Rodgers, S. Tarzi, J.P.M. van den Heuvel, R.J. Wiltshire, X. Wu; two people were elected to Associate Membership: A. Davies, M.L. Parker; and five people were elected to Reciprocity Membership: K. Amin, M. Weiss (both of the Amer. Math. Soc.), R. Mlitz (Deutsche Math.-Verein.), S.A. Whitehouse (Soc. Math. de France), P.G. Batchelor (Soc. Math. Suisse). Two members signed the book and were admitted to the Society.

Lectures were given by L. Keen, 'Deformations of Kleinian groups' and A.G. O'Farrell, 'Some approximation problems and theorems'. After tea, the Chair was taken by Professor D. Armitage, Vice-President of the Irish Mathematical Society, and a lecture was given by B. Branner, 'Surgery in holomorphic dynamics'. The meeting then adjourned.

On Saturday morning, the Chair was taken in turn by Professor I.N. Baker, Dr R.M. Timoney and Professor Armitage, and the following lectures were given: R. Perez-Marco, 'Singular holomorphic dynamics'; S.R. Bullett, 'Dynamics of holomorphic correspondences'; J.-C. Yoccoz, 'The modular group and the Brjuno function'.

## PUZZLE PANEL

David Singmaster is participating in a weekly programme called "Puzzle Panel" which is broadcast on BBC Radio 4 at 1.30 pm weekly on Thursdays, beginning on 4 June. There will be a group of three to five on the panel and they will discuss mathematical and verbal puzzles.

## MEETING TO MARK THE RETIREMENT OF ROBIN KNOPS

There will be a one-day conference, held at Heriot-Watt University on Friday 11th September 1998, to mark the 65th birthday of Professor R.J. Knops. It will consist of invited talks in the area of Applied Analysis and Continuum Mechanics. The speakers will be J.M. Ball (Oxford), G. Capriz (Pisa), M.A. Hayes (Dublin), F. Murat (Paris), O. Penrose (Heriot-Watt), B. Straughan (Glasgow), L. Tartar (Carnegie-Mellon). A dinner will be held in the evening.

The meeting is receiving financial support from the London Mathematical Society and Heriot-Watt University. The organisers are Professors J.C. Eilbeck, J. Howie and A.A. Lacey. Further details are available at http://www.ma.hw.ac.uk/maths/rjk/ or can be obtained from Professor Lacey (A.A.Lacey@ma.hw.ac.uk). Accommodation on campus can be booked by contacting Professor Lacey. Bookings for rooms and for the dinner should be made as soon as possible and preferably by 31st July 1998.

## ANNUAL ELECTIONS TO COUNCIL

A separate article in this issue of the Newsletter makes suggestions for changes in the way Council is elected. The hope is that new regulations will be in place in time for next year, but in 1998 the elections must conform to the present By-Laws. Council has therefore made precisely the same number of nominations as there are vacancies, and the names are given on the next page. Any member of the Society is entitled to make nominations for any of the vacancies, and a nomination form is given on the same page. All nominations must be received by the Council and General Secretary (Professor J.S. Pym, Department of Pure Mathematics, The University, Sheffield S3 7RH) by noon on 1 September 1998.

# COUNCIL ELECTIONS 1998

The following nomnations have been made by Council for the posts which become vacant at the Annual General Meeting in November 1998.

**President**
M J Taylor (UMIST)

**Vice-Presidents** (two vacancies)
K A Brown (Glasgow)
*J W Bruce (Liverpool)

**Treasurer**
A O Morris (Aberystwyth)

**Council and General Secretary**
J S Pym (Sheffield)

**Meetings and Membership Secretary**
To be announced

**Publications Secretary**
E C Lance (Leeds)

**Librarian**
*N L Biggs (LSE)

**Members-at-Large** (nine vacancies)
R J Archbold (Aberdeen) (2)
A G Chetwynd (Lancaster) (2)
*E B Davies (King's, London) (2)
U Martin (St Andrews) (1)
*S E Rees (Newcastle) (2)
E G Rees (Edinburgh) (2)
P T Saunders (King's, London) (1)
A J Scholl (Durham) (2)
J F Toland (Bath) (2)

**Notes on the Nominations**

1. Except for M J Taylor, J W Bruce and N L Biggs, the officers nominated are those serving in 1998. Officers are elected for one year at a time; the President and Vice-Presidents cannot serve for more than two consecutive years, and the others for more than 10 years.
2. Members-at-Large of Council are nominated to serve for either one or two years; the number is given after the name. They may then be eligible for re-election, but cannot serve for more than 6 consecutive years. Those marked with an asterisk are not on the 97/98 Council.
3. U Martin chairs the Computer Science Committee and P T Saunders the Education Committee. Council regards these major administrative roles as comparable with those of officers, and they are therefore nominated for one-year terms.
4. The following were elected to Council for two-year terms in 1998, and so have one year to serve: C A Hobbs (Oxford Brookes), M A H MacCallum (Queen Mary Westfield) and I A Stewart (Leicester).

## NOMINATION FORM

We, the undersigned members of the London Mathematical Society, nominate

(block letters).....

for election as a Member at Large of Council/ .....(or state Office) in the 1998 elections of the Society.

Nominator (signature and printed name) .....

Seconder (signature and printed name) .....

I confirm that I am willing to stand for election as indicated above.

Nominee's signature .....

# Chair of Applied Mathematics

Applications are invited for this post in the School of Mathematics from persons of outstanding research achievement in areas of applied mathematics, including numerical analysis. This post is related to the forthcoming retirement of Professor Philip Drazin.

Preference may be given to active researchers with expertise in scientific computation, and who would strengthen and broaden existing areas of research within the School's Applied Mathematics and Numerical Analysis Group.

Informal enquiries are welcome, and may be made to the Head of School, Dr WGC Boyd E-Mail: w.boyd@bristol.ac.uk, tel: +44 (0)117 928 7974.

**For further details telephone (0117) 925 6450, minicom (0117) 928 8894 or E-Mail Recruitment@bris.ac.uk (stating postal address ONLY) quoting reference 4847.**

**The closing date for applications is 2nd October 1998.**

**UNIVERSITY OF BRISTOL**

AN EQUAL OPPORTUNITIES EMPLOYER

# LMS DEMOCRACY AND COUNCIL STRUCTURE
## A Discussion Paper

**1. The Context** Council committed itself to the introduction of more democracy in its elections as a consequence of the April '97 Special Meeting. Over the last year, Council and the Officers have been busy with the purchase and staffing of the Society's new premises, but are now able to turn to other matters.

In future the Society will be organised in a different way. An Executive Secretary has been appointed together with supporting staff. The majority of the more routine tasks which now fall on the Officers should have been moved in house by the end of the calendar year 1998 so that, for example, in future Officers will chair committees but the duties of minute taking and executing the decisions made will fall on the Executive Secretary and the other staff. Responsibility for the making of policy and major decisions will continue to rest with Council, who are the Trustees of the Society. The Executive Secretary will not be a member of Council.

**2. Structure of Council** The changes at the centre suggest that the Society should consider the structure of Council to ensure that it will continue to meet the Society's needs. Council and its Officers must retain de facto - and not merely nominal - authority to ensure that they determine the Society's policy and activities. This will prevent the possibility of the administration developing its own agenda.

**3. The Size of Council** This should be decided in the light of the following considerations. At present it works well with 20 members, which suggests that this is about the right size for the work it has to do. The number of Officers should be determined by assigning one Officer position to each of the Society's major activities. The Officers should not be allowed to dominate Council however, and the number of ordinary members should certainly not be smaller than the number of Officers.

**4. Officers** There is debate about how many of the Society's activities are important enough to be headed by Officers. Here is a possible list:

President
One or two Vice-Presidents
Treasurer
General Secretary
Programme Secretary
Publications Secretary
Librarian
Chair of the Education Committee
Chair of the Computer Science Committee.

Some positions, such as President, Treasurer and General Secretary seem to choose themselves. The Vice-Presidency is often used to bring onto Council eminent mathematicians who would not otherwise become members; their role has been a very positive one over many years. A Programme Secretary would be responsible for grants awarded to support conferences and visits and for the Society's programme of lectures, courses and symposia; this is the main way in which the Society distributes funds to support mathematics. Publications represents a large part of the Society's work, both in terms of its service to mathematics and as a way of raising funds. The Society's holding of periodicals is one of its great assets. The other two Officer positions are new ones. The Education Committee has been playing an increasingly important role in the Society's work (members will remember "Tackling the Mathematics Problem", and the Society regularly responds to government documents on all issues involving mathematical education). The Society's association with Computer Science has been growing, notably in connection with the MathFit initiative, where a new way

of working with EPSRC has been developed for planning and organising conferences and workshops.

Naturally the Society's interests will continue to develop. The number and functions of Officers should be reviewed from time to time.

**5. Periods of Service** Apart from the President and Vice-Presidents, who cannot serve for more than 2 years, Officers at present face an upper limit of 10 consecutive years, while Members-at-Large of Council have an upper limit of 6 years. Officers are elected annually, though for the last 25 years or so in practice they have served for as many of their 10 years as they have wished. Council members are currently elected for one- or two-year periods, and there have been contested elections from time to time.

(a) One thing about the periods of service of Officers is clear: they should be long enough for Officers to master their areas so that they can make a positive contribution. On the other hand, although the Society has been well served by Officers who have stayed for the full 10 years, elected Officers should face some reasonable time limit. A system in which the expectation is 6 years but in which Council could sometimes invite an Officer to serve for a longer period (say to finish a particular job) provided it did not exceed 10 years might be a good compromise.

Currently Officers are elected for one year at a time. This practice should continue. The Society should have regular opportunities to call an Officer to account if it feels a good job is not being done.

When someone has completed a term as an Officer, there should be a gap of at least two years before the person can again be an Officer or even a member of Council, with the exception that a person can take up the Presidency at any time. Someone who has served as President for a two year term must leave Council for at least the next two years.

Before taking office, each President should serve for one year as a Member-at-Large of Council with the title of President-Designate.

(b) Members-at-Large of Council should be elected for two-year periods, with half the seats becoming vacant each year. If someone resigns during the first year of a term, a replacement should be elected at the next Annual General Meeting who would serve for the remaining year of that term. The expectation should be that a Member-at-Large will serve for no more than 4 consecutive years, but exceptionally could serve for 6. Each period of service should be followed by a gap of at least two years. However, at any time a Member-at-Large should be allowed to be elected as an Officer in accordance with the rules above.

**6. Elections** Elections should be by Single Transferable Vote (in the form presently used by the Royal Statistical Society). One positive feature of this system is that, if there are $n$ vacancies, then any interest group consisting of more than $1/(n+1)^{th}$ of the electorate whose members put their candidate first on their list will gain a representative. Our present 'first past the post' system means that, for example, a pure mathematics view predominates and almost sweeps the board. Under STV, the applied mathematicians who form almost a quarter of our membership should gain a fairer representation on Council.

**7. Nominations** The real problem at present, of course, is that there are rarely more candidates than vacancies. This is undemocratic, but on the whole the system has served the Society reasonably well. Council is very much a working committee, and however its members are chosen they must be capable of doing the job.

A solution would be to have a *Nominating Committee*. It would be charged with finding more than one capable candidate for most vacancies. Each year there should be more candidates for seats on Council for Members-at-Large than places available. For Officer posts, the Nominating Committee should try to find more than one suitable candidate whenev-

er an Officer comes to the end of a term or resigns. Otherwise there should be a presumption that an Officer would be unopposed (by an "official" candidate) until a six-year term has been served.

Of course, all Members of the Society should be entitled to make nominations. This could be done informally by sending suggestions to the Nominating Committee, or formally by sending in names supported by a nominator and six seconders.

**8. Advertising** Elections are not democratic unless the electorate knows what it is choosing. The obvious solution is to allow candidates to advertise themselves, but such advertisements are of limited value. (Personal Statements often promise to look into transforming the face of an organisation, but this is rarely what is required; what the Society mostly wants is a decent job of running the outfit.) The electorate does need to know basic facts, such as mathematical area, main achievements, age, etc. Beyond that, perhaps the Nominating Committee could say why it felt each person was worth putting forward. This Committee could then draw attention to other factors it had taken into account, such as balance in the overall shape of Council. Outside nominations would have to carry a similar statement by nominators, and as far as possible this should be indistinguishable from those of "official" nominees.

**9. Nominating Committee** Of course, the Nominating Committee itself needs members. There would be value in having a Member-at-Large of Council on the Committee as such a person would be familiar with the current problems the Society faced. Perhaps there should be six people on the Committee, two to be replaced each year, and each serving for three years at most to ensure a turnover in the range of ordinary members of the Society known personally to the Nominating Committee. The Nominating Committee should itself make nominations for vacancies arising in its ranks. The Committee would be required to consult widely before making its nominations.

**10. Implementation** Responses to this article are invited by October 10 (addressed to the Executive Secretary at De Morgan House). A detailed plan for change could be considered at Council's November meeting and put to a general meeting of the Society in February. A Nominating Committee should be in place in time for the 1999 elections.

The Council of the
London Mathematical Society
1 June 1998

## IRISH MATHEMATICAL SOCIETY ELEVENTH SEPTEMBER MEETING

### First Announcement

The 11th September meeting of the IMS will be held on 7 and 8 September at the University of Ulster in Coleraine. The following invited speakers have agreed to talk: Professor David Epstein (Warwick) "Learning by Doing: Beginning Analysis"; Professor George Gettinby (Strathclyde) "Mathematics for the Control of Animal Diseases - A Trip to the Zoo"; Professor Ralph Henstock (UU Coleraine) "Calculus and the Gauge Integral"; Dr Brian McMaster (Queen's Belfast) "The Real Line and Transfinite Induction"; Dr Stephen O'Brien (Limerick) "Mathematical Modelling of Industrial Problems".

Participants are invited to give lectures of up to 30 minutes duration (25 minutes plus 5 minutes for discussion ) on a topic of their choice. In the event of too many participants wishing to talk it may not be possible to accept all applications.

The Coleraine campus is out of town, and participants are recommended to take the conference package of accommodation on campus in university houses, together with meals if required. Prices range from £12 for bed only. Facilities will be available in the Senior Common Room for participants arriving on the Sunday.

Accommodation is available off campus, lists can be obtained from the Northern Ireland Tourist Board, Railway Road, Coleraine (01265) 44723. The conference banquet will be held on the Monday evening, costing about £25. There is a conference fee of £10. This is waived for IMS members. Tea, coffee and biscuits will be provided on each morning and afternoon of the conference. Parking is available on campus without booking. A booking form will be included in the second notice to be sent out in the summer.

For more information, contact: Pauline Marshall, The Secretary, 11th IMS September Meeting, School of Computing and Mathematics, University of Ulster at Coleraine, Coleraine, County Londonderry BT52 1SA; tel: (01265) 324605; fax: (01265) 324440; e-mail: P.Marshall@ulst.ac.uk. The Chairman of the organizing committee is Professor S.K. Houston and the local organizers are Mr G.P. Shannon and Dr C.T. Stretch.

## FELLOWS OF THE ROYAL SOCIETY

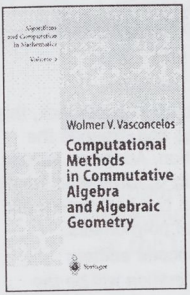
Amongst those elected to Fellowship of the Royal Society in May 1998 were: Colin Atkinson, Professor of Applied Mathematics in the Imperial College London; Andrew John Casson, Professor of Mathematics in the University of California at Berkeley; Stephen Arthur Cook, Professor of Computer Science in the University of Toronto, Canada; Geoffrey Edward Hinton, Professor of Computer Science and Psychology in the University of Toronto, Canada; Ashoke Sen, Professor in the Mehta Research Institute of Mathematics and Mathematical Physics, Allahbad, India; Srinivasa Varadhan, Professor of Mathematics in the Courant Institute, New York University, USA.

## LONG-STANDING MEMBERS

The following is a list of mathematicians who had completed fifty years or more of membership of the London Mathematical Society at the end of June 1998.

| | | | | | |
|---|---|---|---|---|---|
| 1929 | Chowla, S.S. | 1940 | Willmore, T.J. | 1946 | Huppert, E.L. |
| 1929 | Wright, E.M. | 1942 | Edmonds, S.M. | 1946 | Rankin, R.A. |
| 1930 | Offord, A.C. | 1943 | Dyson, F.J. | 1946 | Rees, D. |
| 1931 | McCrea, W.H. | 1944 | Kneebone, G.T. | 1946 | Rothman, M. |
| 1932 | Jeffreys, B. | 1944 | Weston, J.D. | 1946 | Ruston, A.F. |
| 1932 | Lord, R.D. | 1944 | Wilkes, E.W. | 1947 | Cassels, J.W.S. |
| 1932 | Potter, H.S.A. | 1944 | Williams, A.E. | 1947 | Friedlander, F.G |
| 1932 | Walker, A.G. | 1945 | Barnard, G.A. | 1947 | Ghaffari, A. |
| 1933 | Cossar, J. | 1945 | Bradburn, M. | 1947 | Hay, G.E. |
| 1933 | Young, L.C. | 1945 | Collard, K. | 1947 | Hayman, W.K. |
| 1934 | Meyler, D.S. | 1945 | Henstock, R. | 1947 | Hilton, P.J. |
| 1935 | Howlett, J. | 1945 | Ollerenshaw, K. | 1947 | Macbeath, A.M |
| 1936 | Neumann, B.H. | 1945 | Prior, L.E. | 1947 | Smith, C.A.B. |
| 1937 | Pitt, H.R. | 1945 | Rogers, C.A. | 1948 | Bateman, P.T. |
| 1938 | Derry, D. | 1945 | Tropper, A.M. | 1948 | Burkill, H. |
| 1938 | Love, E.R. | 1945 | Tutte, W.T. | 1948 | Fishel, B. |
| 1938 | Smithies, F. | 1946 | Goldie, A.W. | 1948 | Isaacs, G.L. |
| 1939 | Spencer, D.C. | 1946 | Goodall, M.C. | 1948 | Mullender, P. |
| 1940 | Good, I.J. | 1946 | Higman, G. | 1948 | Reade, M.O. |
| 1940 | Kendall, D.G. | 1946 | Howarth, L. | 1948 | Stone, A.H. |

# New from Springer




W.V. Vasconcelos

## Computational Methods in Commutative Algebra and Algebraic Geometry

1998. XI, 394 pp. 11 figs.
(Algorithms and Computation in Mathematics, Vol. 2)
Hardcover £ 45.50
ISBN 3-540-60520-7

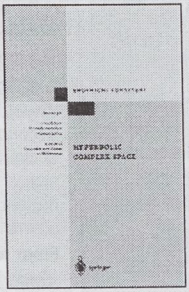
Deals with methods and techniques to tackle problems that can be represented by data structures which are essentially matrices with polynomial entries, mediated by the disciplines of commutative algebra and algebraic geometry. The volume relates discoveries by a growing, interdisciplinary group of researchers in the past decade, highlightening the use of advanced techniques to bring down the cost of computation. Includes concrete algorithms written in MACAULAY.

N. Koblitz

## Algebraic Aspects of Cryptography

1998. IX, 206 pp. 7 figs.
(Algorithms and Computation in Mathematics, Vol. 3)
Hardcover £ 37.50
ISBN 3-540-63446-0

The first half is a self-contained informal introduction to areas of algebra, number theory, and computer science that are used in cryptography. Most of the material in the second half - "hidden monomial" systems, combinatorial-algebraic systems, and hyperelliptic systems - has not previously appeared in monograph form. The Appendix by Menezes, Wu, and Zuccherato gives an elementary treatment of hyperelliptic curves.




S. Kobayashi

## Hyperbolic Complex Spaces

1998. XIII, 471 pp. 8 figs.
(Grundlehren der mathematischen Wissenschaften A Series of Comprehensive Studies in Mathematics, Vol. 318)
Hardcover £ 64.50
ISBN 3-540-63534-3

A comprehensive and systematic account on the Carathéodory and Kobayashi distances, hyperbolic complex spaces and holomorphic mappings with geometric methods. A very complete list of references should be useful for prospective researchers in this area.

H.L. Resnikoff, R.O.W. Wells, Jr.

## Wavelet Analysis

**The Scalable Structure of Information**

1998. Approx. 540 pp. 119 figs.
Hardcover £ 49.00
ISBN 0-387-98383-X

This text introduces the ideas and methods of wavelet analysis, relates them to previously known methods in mathematics and engineering, and shows how to apply wavelet analysis to digital signal processing.

**Please order from**
**Springer-Verlag London Ltd.**
**Fax: + 44 / 14 83 / 41 51 51**
**e-mail: sarah@svl.co.uk**
**or through your bookseller**

Errors and omissions excepted.
Prices subject to change without notice.
In EU countries the local VAT is effective.

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Springer-Verlag, P. O. Box 31 13 40, D-10643 Berlin, Germany.

Gha.5053/MNT/SF

# Mathematics from Oxford

## Metric Number Theory

**Glyn Harman**

A new title in the **London Mathematical Society Monographs series**, this book deals with the arithmetical properties of almost all real numbers. It brings together many different types of result (including normal numbers, Diophantine approximation and uniform distribution) never covered within the same volume before. By this approach interactions and common themes between different branches of the subject are revealed.

**London Mathematical Society Monographs No. 18**
320 pp, June 1998
0-19-850083-1 Hardback **£65.00**
**25 % discount to LMS members** **£48.75**

## Projective Geometries over Finite Fields

### Second Edition

**J. W. P. Hirschfeld**

This is a complete reworking of the out-of-print first volume of a three-volume treatise on finite projective spaces. There are numerous articles in journals, but this is the only extended work in the area. It also includes a comprehensive bibliography of more than 3000 items.

**Oxford Mathematical Monographs**
570 pp, 1998
0-19-850295-8 Hardback **£65.00**

## Mathematical Topics in Fluid Mechanics

### Volume 2: Compressible Models

**Pierre-Louis Lions**

Written by one of the world's leading experts on nonlinear partial differential equations, this second volume describes compressible fluid-mechanics models. It contains entirely new material on a subject known to be rather difficult and important for applications (compressible flows). It is a unique effort on the mathematical problems associated with the compressible Navier-Stokes equations.

**Oxford Lecture Series in Mathematics and Its Applications No. 10**
362 pp, 1998
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**(Volunme 1)**
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| Type of Grant | General Purpose | Amount | Deadlines |
|---|---|---|---|
| Conference Grant | Support of conferences within the UK. The grant may be either a substantial contribution to a small meeting or a small contribution to a large meeting | Up to £2500 | 31 January, 31 May and 31 August |
| Scheme 2 | Support for a foreign visitor who will give lectures at three places in the UK | Return travel to UK up to a maximum of £1000 | At least three months before the visit |
| Scheme 3 | Support of incidental costs for collaborative work by research groups from three (or more) different places | Travel or other costs up to £1000 for one year | 31 January, 31 May and 31 August |
| Scheme 4 | Support of travel and subsistence costs incurred by a UK member or their collaborator in carrying out joint research. | Up to £300 | 31 January, 31 May and 31 August |
| fSU Scheme | Support of visits to UK by fSU mathematicians and support of visits to fSU by UK mathematicians | Basic travel and living expenses up to £1000 | At least three months before the visit |

Only Society members are eligible for Scheme 4 grants. Otherwise, any mathematician working in the UK is eligible for a grant; applications from non-members must be countersigned by a Society member. Applications for conference grants must be submitted on the appropriate form, available either from the Society's Office (lms@lms.ac.uk), or from the Society's ftp archive which can be reached via ftp ftp.qmw.ac.uk. In all other cases, applications should be made by letter, including (as appropriate) the academic case, details of participants and activities, places to be visited, the proposed timetable and a budget of estimated costs.

Applications should be sent to the Administrator, Miss Susan Oakes, at De Morgan House, 57-58 Russell Square, London WC1B 4HP (tel: 0171 323 3686; e-mail: lms@lms.ac.uk; fax: 0171 323 3655). Further information and advice can be obtained from her or from the Meetings and Membership Secretary, Dr D.J.H. Garling, Department of Pure Mathematics and Mathematical Statistics, 16 Mill Lane, Cambridge CB2 1SB (e-mail d.j.h.garling@pmms.cam.ac.uk; fax 01223 337920; tel: 01223 337978). The information is on the Society's home page on the world wide web at http://www.lms.ac.uk/grants/.

## CONFERENCE

| Topic | Applicant | Grant |
|---|---|---|
| Computational and Geometric Aspects of Modern Algebra | M D Atkinson | £2,200.00 |
| The History of Cryptography (BSHM) | J V Field | £1,000.00 |
| The History of Combinatorics (BSHM) | R J Wilson | £800.00 |
| Scottish Algebra Day | J Howie | £915.00 |
| STATMECH-14 | A C C Coolen | £1,000.00 |
| Asymptotic and Numerical Methods in Wave Propagation with Applications | R H Tew | £865.00 |
| Conference to mark the retirement of Geoffrey Horrocks | B E Johnson | £1,750.00 |
| Applied Analysis and Continuum Mechanics: A meeting in honour of the 65th birthday of Professor R J Knops | J C Eilbeck | £1,000.00 |
| Probability: Theory and Applications | D Applebaum | £2,500.00 |
| 21st Research Students' Conference in Probability and Statistics | J Currie, J White & E Casson | £50.00 |
| One Day Combinatorics Colloquium | A J W Hilton | £375.00 |
| Nonlinear pulmonary and cardiovascular fluid flows | T J Bridges & D Gammack | £393.70 |
| The 1998 Summer Permutation Group Theory Meeting | R Baddeley | £1,200.00 |
| 19th IFIP TC7 Conference on System Modelling and Optimization | M J D Powell | £1,000.00 |

## SCHEME 2

| Applicant | Visitor | Places to Visit | Grant |
|---|---|---|---|
| P McMullen | J Richter-Gerbert | UCL, Oxford & Cambridge | £200.00 |
| T H Lenagan | K R Goodearl | At least 3 of the following: Edinburgh, Glasgow, Sheffield, Leeds & Exeter | £850.00 |
| M Grinfeld | M Slemrod | Oxford, Heriot-Watt & Strathclyde | £600.00 |
| V A Liskevich | P Stollmann | Imperial, Oxford & Bristol | £170.00 |
| G Blower | S Szarek | Oxford & NBFAS in Edinburgh | £300.00 |
| L J Mason | S Klainerman | Oxford, QMW & Cambridge | £250.00 |
| J Brodzki | N Higson | Exeter, Oxford & Edinburgh | £550.00 |
| M Nicol & P Ashwin | M Field | Warwick, Surrey & UMIST | £640.00 |

## SCHEME 3

| Applicant | Institution | Topic | Grant |
|---|---|---|---|
| R M Green | Lancaster | Quantum Groups | £750.00 |
| Y V Kurylev | Loughborough | Multidimensional Inverse Problems | £900.00 |
| J P C Greenlees | Sheffield | Transpennine Topology Triangle | £1,000.00 |

**SCHEME 4**

| Applicant | Institution | Collaborator | Institution | Grant |
|---|---|---|---|---|
| Z A Lykova<br>J Berndt<br>M S P Eastham | Newcastle<br>Hull | J Brodzki<br>M Bruck<br>B M Brown &<br>D K R McCormack | Exeter<br>Cologne<br>Cardiff | £300.00<br>£220.00<br>£300.00 |
| M Y Prest<br>J Merkin<br>M Kelbert | Manchester<br>Leeds<br>Swansea | H Krause<br>D J Needham<br>A Grigor'yan &<br>Y Suhov | Bielefield<br>Reading<br>Imperial &<br>Cambridge | £300.00<br>£250.00<br>£300.00 |
| G R Everest<br>P J Aston | East Anglia<br>Surrey | B N Fhlathúin<br>M Dellnitz | Maynooth<br>Bayreuth | £200.00<br>£300.00 |

**fSU SCHEME**

| Applicant | Visitor | Institution | Places to Visit | Grant |
|---|---|---|---|---|
| I B Fesenko | I B Zhukov | St Petersburg | Nottingham | £1,000.00 |
| V A Galaktionov & C J Budd | S I Pohozaev | Steklov MI, Moscow | Bath, Oxford & Heriot-Watt | £1,000.00 |
| Y V Kurylev & R Tew | A P Katchalov | Steklov MI, St Petersburg | Loughborough, Nottingham & Oxford | £1,000.00 |
| N F Britton | G P Karev & F Berezovskaya | Russian Academy of Sciences, Moscow | Bath & Oxford | £800.00 |
| M White & Z Lykova | S S Akbarov | Bauman Moscow State Technical University, Moscow | Newcastle | £1,000.00 |
| P McIver | N Kuznetsov | Russian Academy of Sciences, St Petersburg | Loughborough, Bristol & Manchester | £1,000.00 |
| S B Kuksin | A L Skubachevskii | Moscow State Aviation Institute | Heriot-Watt and one other British University | £1,000.00 |
| D A Jordan | | | International Algebraic Conference, Moscow | £600.00 |
| N Vorobjov | G N Beltadze | Kutaisi, Georgia | Bath and one other British University | £1,000.00 |
| A P Fordy | L Bogdanov,<br>A Borisov,<br>E Kuznetsov,<br>S Manakov,<br>A Pogrebkov &<br>V E Zakharov | Moscow<br>Ekaterinburg<br>Moscow<br>Chernogolovka<br>Moscow<br>Chernogolovk | NEEDS98 and one other mathematics department | £2,880.00 |

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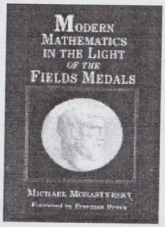


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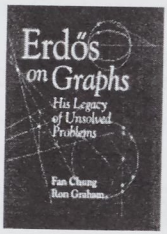


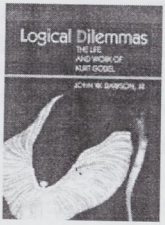

Erdős on Graphs

Fan Chung and Ron Graham

ISBN 1-56881-079-2

Hardcover, 160 pp., $30.00, £20.00

This comprehensive and well-documented problem collection is a tribute to Paul Erdős, the *wandering mathematician,* who has been called the "prince of problem solvers and absolute monarch of problem posers." It continues his mission to find the perfect proof and contains information about prizes offered by Erdős that are still available, as well as anecdotes and reminiscences by his friend Andy Vázsonyi.




Logical Dilemmas

John Dawson

ISBN 1-56881-025-3

Hardcover, 376 pp., $49.95, £36.00

This is the authoritative biography of Kurt Gödel. His seminal achievements, which shook and clarified the foundations of mathematics, are explained within the context of his life from the turn of the century in Austria to his refuge at the Institute for Advanced Study in Princeton.

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## Senior Research Fellowships

All Souls College intends to elect two Senior Research Fellows with effect from 1st October 1999 (or an agreed later date). One Fellowship will be in Law, and one in Mathematics or the Theoretical Life Sciences (both subjects broadly conceived). The Fellowships are open to women and men.

The College regards a Senior Research Fellowship as being of comparable academic standing to an Oxford University Professorship, and applicants are expected to have a correspondingly distinguished record of achievement in research.

Senior Research Fellowships are normally held until retirement age (subject to renewal by the College every seven years and the requirements of the Education Reform Act, 1988).

Further particulars, including details of emoluments and terms of appointment, application forms, and copies of a memorandum for referees may be obtained from the Warden's Secretary, All Souls College, Oxford OX1 4AL. Applications, on the application form, should reach the Warden not later than Friday, 18th September 1998 (the envelope containing the application to be marked "Senior Research Fellowship"). Applicants are asked to ensure that references, from not more than three referees, also reach the Warden by Friday, 18th September 1998.

## BOOK REVIEW

**Pi: A Source Book** by Lennart Berggren, Jonathan Borwein and Peter Borwein. Springer, 1997, 716 pp, £37.50.

**The Joy of $\pi$** by David Blatner. Allen Lane, The Penguin Press, 1997, 130 pp, £12.99.

Perhaps no concept has captured the mathematical imagination more than the circle ratio $\pi$, while no mathematical symbol has evoked more mystery, romanticism and popular appeal than $\pi$ itself. Why this fascination with mathematics' most famous number? For the professional mathematician, $\pi$ has long presented a challenge, being taciturn by nature and yielding up its splendours only grudgingly. When they are teased out, however, the effort expended is often handsomely repaid. Among reasons drawing the amateur to $\pi$ are: its habit of turning up everywhere, often in unexpected places; the highly publicized search for its decimal digits, with world records tumbling almost annually in today's age of the supercomputer; and its long, colourful history filled with incident, drama, humour, genius and eccentricity. Continued interest in $\pi$ over four millennia has resulted in the accumulation of a vast $\pi$-archive. What, then, do the two books under review here contribute to this collection?

*Pi: A Source Book*, the first source book on $\pi$ ever to be published, documents, mainly through original writings, the history of $\pi$ from the dawn of mathematical time to the present day. One only has to glance at the Contents to appreciate the pre-eminent role played by $\pi$ in the history of mathematics, the seminal ideas to which it has given birth, and the number of illustrious mathematicians who have fallen under its spell. Furthermore, the list of titles supports the authors' claim that the computation of $\pi$ is the one topic from the most ancient stratum of mathematics that continues to be vigorously researched today, and that to trace its development is to follow a thread which winds through geometry, analysis and special functions, numerical analysis, algebra and number theory. One beauty of the anthology is the inclusion of so much contemporary, yet still accessible, mathematics - more than half of the collected articles are from the latter half of this century, the most recent published in 1996, the year of the book's completion!

The compilation itself comprises seventy articles (mostly research papers, but also a few historical studies and items of a more light-hearted nature) arranged chronologically and presented in their original form (photo-copies, in fact) without accompanying comment, although each is accorded an illuminating one sentence description in the Contents. The introduction provides an overview of the whole collection, which serves to place individual articles into historical context, and there are three short appendices: *On the Early History of Pi, A Computational Chronology of Pi* (out of date even before publication) and *Selected Formulae for Pi*. A striking multicoloured design adorns the front cover, while more than 10,000 digits of $\pi$'s decimal expansion decorate it on the inside.

The authors divide their material into three periods: before Newton, Newton to Hilbert, and the Twentieth Century. The earliest of these, containing fifteen papers from Egyptian, Chinese, Arabic, Indian and European sources, commences with a problem from the Rhind Papyrus (1650 BC) showing that the ancient Egyptians assumed an implicit value for $\pi$ of 256/81, and concludes with the debut of $\pi$ to denote the circle ratio, in William Jones' *A New Introduction to the Mathematics* (1706). Incidentally, the Jones' extract can also boast the first calculation of $\pi$ to a 100 decimal places, *computed by the accurate and Ready Pen of the Truly Ingenious Mr John Machin*, but no mention is made of this. Archimedes' *On the Measurement of the Circle*, which dominated the subject in the pre-calculus era, is well represented, as are the original derivations of the first infinite expressions for $\pi$, those linked with the names of Viète (1593) and Wallis (1655). Another gem is Ranjan Roy's paper on the independent discovery of the power series for $\tan^{-1}x$ by Gregory (1671), Leibniz

(1673) and a lesser known Indian mathematician, Nilakantha (1450).

What the period from Newton to Hilbert lacks in quantity, with only nine representative papers, it certainly compensates for in quality. Euler's dazzling mastery of formal algebraic manipulation, combined with innate good judgement, is exhibited in a chapter from his *Introduction to Analysis of the Infinite* (1748), which includes derivations of his celebrated series for powers of $\pi$. Then follow the first proofs of the transcendence of $e$, by Hermite (1873), and of $\pi$, by Lindemann (1882). Lindemann's paper, a landmark in the history of mathematics, showed once and for all *that the circle could not be squared.* Simpler proofs of the transcendence of $\pi$ by Weierstrass (1885) and Hilbert (1893) are also given.

The twentieth century selections are divided between analytical and computational studies. Opening the former is Ramanujan's seminal paper *Modular Equations and Approximations to* $\pi$ (1914), which exhibits some remarkable series for $1/\pi$. Watson's *The Marquis and the Land Agent: A Tale of the Eighteenth Century* (1933) is a delightful exposition of the early development of elliptic functions, which play a role in some modern computations of $\pi$. Other highlights include: Niven's one page proof of the irrationality of $\pi$, influential papers by Kurt Mahler and Alan Baker, and two articles on Apery's controversial proof (1978) of the irrationality of zeta(3). The computational selection covers the first electronic computation (ENAIC) of $\pi$ in 1949, the independent discovery of arithmetic-geometric mean based algorithms for the computation of $\pi$ by Salamin and Brent in 1976, and papers by Kanada, the Borwein brothers and the Chudnovsky brothers, today's leading exponents on the computation of $\pi$. A recent (1996) paper by David Bailey, Peter Borwein and Simon Plouffe serves as a worthy climax to this wonderful treasury and points the way to future developments. It describes a fast algorithm for determining *individual* digits of $\pi$ in certain bases and illustrates its effectiveness by showing that the ten billionth hexadecimal digit of $\pi$ is a 2!

Few mathematics books serve a wider potential readership than does a source book and this particular one is admirably designed to cater for a broad spectrum of tastes: professional mathematicians with research interest in related subjects, historians of mathematics, teachers at all levels searching out material for individual talks and student projects, and amateurs who will find much to amuse and inform them in this leafy tome. The authors are to be congratulated on their good taste in preparing such a rich and varied banquet with which to celebrate $\pi$.

*The Joy of* $\pi$ is a highly entertaining, (too?) lavishly designed book, which more than fulfils the expectation generated by its title and striking dust jacket blazoning an incandescent $\pi$ shining forth from a star-studded jet sky. It is unashamedly popular in its approach, clearly aimed at the mass market, somewhat along the lines of the bestselling *Longitude* by Dava Sobel and the books on *Fermat's Last Theorem* by Aczel and Singh, but less substantial. In a lively and engaging style, the author tells the tale of $\pi$ and man's fascination with it, sprinkling his narrative with rich helpings of $\pi$ trivia: titbits about $\pi$-eccentrics, $\pi$'s own idiosyncrasies, multilingual mnemonics for $\pi$, and $\pi$-inspired quotations, poems, limericks, anecdotes, jokes and cartoon. In addition to more familiar stories, such as Indiana's notorious attempt to legislate a legal value of $\pi$ in 1897, there are others that are brand new, like a transcript from the O J Simpson trial in which an FBI agent and the learned Judge express differing opinions on the value of $\pi$, the former believing it to be 2.12, the latter 3.1214 ! Each page is individually and attractively, if occasionally over fussily, laid out with imaginative use of two-colour (black and green) artwork, although it is surely a misjudgement to squander space by strewing a million illegible decimal digits of $\pi$ across the pages of the book, when most of them are infuriatingly unnumbered. Readers who still have not had their fill of $\pi$ are exhorted to start web-surfing at

http://www.joyofpi.com .

One item appearing in both books, and for the first time in print, is Michael Keith's *pi Mnemonics and the Art of Constrained Writing*. This has for its showpiece a rewriting of Edgar Allen Poe's poem, The Raven, in such a way as to preserve as far as possible the story, tone and rhyming scheme of the original, while simultaneously creating a 740 word mnemonic poem for $\pi$. In the *Source Book* the mnemonic begins as intended: *Poe E, Near a Raven ...* , but in *The Joy of* $\pi$ it commences *Pie E, Near a Raven ...* , under the circumstances, a most forgivable Freudian slip!

Roger Webster
Sheffield University

## RECENT ADVANCES IN SEMANTICS AND TYPES FOR CONCURRENCY

An instructional meeting on Recent Advances in Semantics and Types for Concurrency: Theory and Practice will be held at Imperial College, London from 7 - 9 July 1998. This workshop is centred around recent developments in semantic and type-theoretic foundations for concurrency and (industrial) applications of these results. The recent explosion of activity on the internet and world wide web has highlighted the need for formal foundations for secure distributed systems. The nature of computing is changing constantly, and new techniques have to be developed to cope with these changes. In addition to bringing together a coherent body of existing work on theoretical foundations for such complex systems, the meeting will also serve as a forum for discussing practical applications, especially to programming languages, networks, telecommunication, and security. There will also be a panel discussion on future directions. The beneficiaries of this meeting are PhD students, and established researchers who wish to learn about recent developments in the area.

The invited speakers are: Nick Benton (Persimmon IT, Inc.), Philippa Gardner (University of Cambridge), Simon Gay (Royal Holloway), Andrew Gordon (Microsoft Research), Will Harwood (APM), Kohei Honda (University of Edinburgh), Yves Lafont (CNRS, Institut de Mathematiques de Luminy), Peter Sewell (University of Cambridge) and Jean-Pierre Talpin (INRIA, Rennes).

The meeting is supported by the MathFit initiative of the LMS and EPSRC. In accordance with the objectives of MathFit, the programme has been designed to contain instructional and introductory interdisciplinary components. The registration fee is £25 for students, and £40 for others. Due to funding from MathFit, there will be a few grants for PhD students. For further details visit the website (http://theory.doc.ic.ac.uk/~raja/Mathfit/) or contact the organizers: Rajagopal Nagarajan, (R.Nagarajan@doc.ic.ac.uk; tel: 0171 594 8291), Bent Thomsen (bt@sst.icl.co.uk; tel: 01344 472510), Lone Leth Thomsen (lone@sst.icl.co.uk, tel: 01344 472555).

## UNDERGRADUATE MATHEMATICS TEACHING CONFERENCE (UMTC98)

This is a working conference to be held at Sheffield Hallam University, from 7 - 10 September 1998, and is based this year on four group themes: Modern Approaches to Teaching Calculus, The Impact of Technology on Assessment, What is a Mathematics Degree for? and Students Talking Mathematics. Reports from each group are refereed by other groups and published in the conference proceedings. There are two plenary sessions with presentations this year given by Professor Sir Robert May, Chief Scientific Advisor to the UK Government and Head of the Office of Science and Technology and Dr Michael Emery, Associate Director of the Quality Assessment Agency for HE in the UK. While most of the conference is spent in the workgroups, there is an opportunity for delegates to give short presentations, abstracts from which will appear in the conference proceedings. For more information, see UMTC98 web page (http://www.hull.ac.uk/mathskills/umtc/umtc98/).

H. HOPF
Honorary Member 1956

# 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.

## JULY 1998

**2-3** European Women in Mathematics Workshop on Moduli Spaces in Mathematics & Physics, Oxford (256)(257)

**3-6** Teaching of Mathematics Conference, Samos, Greece (257)

**5-9** Mathematics Colloquium, Victoria University of Wellington, New Zealand (254)

**13-24** Symplectic Topology Workshop, Warwick University (255)

**19-25** Galois Representations in Arithmetic Geometry Meeting, Crete (256)

**20-24** Dimensions and Dynamics Conference, Miskolc, Hungary (254)

**20-24** Domain Decomposition Methods Conference, Greenwich University (254)

**20-24** Random Walks and Sampling Algorithms MathFit Summer School, University of Warwick (260)

**20-28** Mathematics and Physics of Higher-Dimensional Solitons, LMS Durham Symposium (261)

**23-31** Computation and Geometric Aspects of Modern Algebra, ICMS Worshop, Heriot-Watt University (258) (259)

**26-30** Randomised Algorithms and Stochastic Simulation Tutorial and Workshop, University of Warwick (260)

**27-7 Aug** Nonlinear Analysis, Differential Equations and Control Seminar, Montreal, Canada (254)

## AUGUST 1998

**6-10** Stokes Summer School, Skreen, County Sligo (260)

**13-16** Commutative Algebra Conference in Honour of David Rees's 80th Birthday, University of Exeter (257)

**18-28** International Congress of Mathematicians, Berlin, Germany (238) (242) (253)

**24-26** Hele-Shaw Problem Workshop, Oxford (260)

**27-31** Discrete Groups and Conformal Geometry Conference, Malardalen University, Sweden (259)

**30-5 Sept** Algebraic Number Theory and Diophantine Analysis Conference, Graz, Austria (249)

**31-5 Sept** Representation Theory of Algebras, University of Bielefeld, Germany (258)

## SEPTEMBER 1998

**6-11** British Association for the Advancement of Science Festival, Cardiff (257)

**7-11** Infinite Length Modules, University of Bielefeld, Germany (258)

**10-11** Meeting to Mark the Retirement of Geoffrey Horrocks, Newcastle upon Tyne University (259)

**14** Physical Interpretations of Relativity Theory, Imperial College London (258)

**14-18** Integrability: the Seiberg-Witten and Whitham Equations Workshop, Edinburgh (261)

## OCTOBER 1998

**16-17** Two-day London Mathematical Society Meeting - Harmonic Analysis

## NOVEMBER 1998

**20** London Mathematical Society Meeting - Annual General Meeting

## DECEMBER 1998

**16-22** Symmetry and Perturbation Theory Workshop, Rome, Italy (258)

## JANUARY 1999

**25-27** Phase-Transition Phenomena in Combinatorial Problems EPSRC/LMS MathFit Workshop, Liverpool (261)

## FEBRUARY 1999

**12-13** Two-day London Mathematical Society Meetings, Proof and Computation, University of Leeds

## MARCH 1999

**29 - 1 Apr** British Mathematical Colloquium, Southampton

## MAY 1999

**14-16** Belgian Mathematical Society and London Mathematical Society Joint Meeting, Université de Bruxelles (260)(261)

## JULY 1999

**5-9** International Congress of Industrial and Applied Mathematics (ICIAM 99), Edinburgh (252)

**12-16** British Combinatorial Conference, Kent University (254)

**12-16** American Mathematical Society and Australian Mathematical Society Joint Meeting, University of Melbourne (260)

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.

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