THE LONDON MATHEMATICAL SOCIETY NEWSLETTER

No. 271 May 1999

FORTHCOMING SOCIETY MEETINGS

Friday-Sunday 14-16 May 1999 - Brussels
Joint meeting with the Belgian Mathematical Society
Friday 18 June 1999 - London
D. McDuff (Hardy Lecture), D Salamon
Friday-Saturday 15-16 October 1999 - London
New Applications of Twistor Theory

LMS 1999 RETREAT

During the last weekend of February the LMS Council Retreat was held in Manchester. We assembled at Friday lunchtime, and the retreat lasted until Saturday teatime. Working groups had prepared papers for discussion, covering six different themes. We had in all 8 1/2 hours of formal meetings, with more informal discussion during breaks and at mealtime.

The last 'retreat' held by Council (which was the first that the writer attended) was the Special Meeting held in early 1997. It was at that meeting that plans to purchase the Society's own building, and to completely reorganise its administrative structure, emerged. This year's retreat was, I felt, conducted more in a spirit of consolidation and reflection than of radical innovation, although several difficult questions were addressed which may have a significant impact on the shape of the Society.

The six themes to be discussed were announced in the January *Newsletter*, and a number of members had contributed their views. It should be emphasised that the retreat is not a formal Council meeting; no decisions are taken, and so I shall report largely on the drift of the discussions. Specific proposals are likely to be brought to future Council meetings, and you will be able to read more in the months coming.

Alun Morris, Elmer Rees and Nick Woodhouse prepared a discussion paper on *The Society's Scientific Activities*. There are two LMS committees involved. One is Programme Committee, administering grants and planning the Society's own meetings. The other is Research Meetings Committee (formerly the Durham Symposia Committee) - this now has a wider responsibility, including short courses (the number of which is set to double) and LMS workshops and symposia. The general feeling was that for the time being Research Meetings Committee should be consolidating its existing activities rather than embarking on new initiatives. We talked about various ways in which the pattern of Society Meetings might change - apart from changing frequency and location, ideas floated included arranging video relay of meetings (there are some organisations which have used this very effectively) and having activities aimed at undergraduates interested in going on to do research (although the BMC might be a more appropriate occasion for this). The grant schemes have been expanded recently, but some slight modification is likely so as to accommodate the new relationship between the LMS and the Morningside Mathematical Centre in China.

The future of the Hardy Lectureship was also discussed. The Hardy Lecturer tour is welcomed by members in the regions, but it must be admitted that it is not an itinerary for the faint-hearted. It was suggested that the lectureship might be converted into a fellowship, to be held for 3-4 months in a single institution, with a lecture tour attached.

We had an interesting debate on *Women in Mathematics* (convened by Cathy Hobbs). It is clear that the proportion of women pursuing academic mathematical careers in the UK is rather low. We discussed possible causes of the problem (which is not restricted to mathematics) and how the Society could help. The AMS collates interesting statistics on sex ratios in the American mathematical world (including staff and students at various levels) and it was suggested that we might do the same. It also has a committee for women in mathematics, and it was felt that to set up such a committee within the LMS would be a step in the right direction. One issue for such a committee to explore would be how the LMS can help with the problem of career breaks arising from parenthood.

A major issue of discussion was the place of applied mathematics within the Society. This came up first in discussion of *Publications*, where Chris Lance (Publications Officer) presented a paper discussing possible LMS initiatives in the publication of applied mathematics. Many members of the LMS are applied mathematicians, but outside *Nonlinearity* and *Journal of Computation and Mathematics*, our journals publish little applied mathematics. We believe that the other three paper journals (*Bulletin, Journal* and *Proceedings*) are very successful in their present format, with many more good papers submitted than they can accommodate, and that it would be unwise to tamper with them in a (possibly futile) attempt to broaden their scope. However, there are other ways in which the LMS can strengthen its commitment to applied mathematics publishing - particularly through the LMS Lecture Notes and Monographs series. One structural problem is that Publications Committee is mainly absorbed with day-to-day issues, rather than strategic ones; perhaps we need a different mechanism to review regularly the LMS publications policy.

In a separate session we discussed a lengthy and penetrating paper on *Relationship with applied mathematics, the IMA, and New Universities* (convened by Malcolm MacCallum). Many interesting issues arose, more than could be discussed in the time available. It was argued that to fulfil its charter the LMS had to be representative of all of mathematics. The Nominating Committee already proposed for finding candidates for Society office, together with the Single Transferable Vote, should increase representation of applied mathematics within the Society. Several proposals for greater co-operation with the IMA were received warmly. One problem that comes up often is that there are too many bodies speaking on behalf of mathematics for a coherent message to be heard. (A letter from David Brannan, President of HoDoMS, listed 14 such bodies.) We are now looking more favourably on the notion of a Forum of presidents of the learned mathematical societies - there is already a less formal system of meetings, but this would add more structure for the increasing cooperation with the IMA and the RSS. We were in general agreement that we should publicise our activities to the 'new universities', who were greatly under-represented in our membership.

The present writer's job was to convene a working group on *Public relations and the media*, which he did with welcome assistance from Peter Saunders, LMS Publicity Officer. The general feeling is that we are rather too modest when it comes to PR. There was a long discussion about the LMS web site, currently maintained by Wilfrid Hodges and Derek Holt, for which there was much praise as a resource for members. It is perhaps time to develop it so as to have more information for others, about mathematics in general and about what the Society is doing (many other learned societies have done this). We do not under-

estimate the effort which will be involved in updating and maintaining a WWW site on the scale envisaged.

The discussion on *Education* (convened by Peter Saunders) covered mathematical education in both schools and universities. In schools, the major task is to ensure that the voice of academic mathematicians is heard in government. Cooperation with other societies is vital for success here. In university education the developments of 'benchmarking' and the Institute for Learning and Teaching have exercised the minds of many. The President, in conjunction with presidents of the other mathematical societies, is becoming involved in the formulation of proposals for benchmarking, though it remains to be seen whether such a notion really makes sense in mathematics. There was considerable discussion about how much the LMS should be involved with the ILT and similar organisations. Scepticism of the ILT and its agenda is rife, not just within LMS Council, but we felt that if we wanted to have any influence on the development of this aspect of university education it was unwise to be a bystander.

Tony Scholl

ALGEBRAIC AND GEOMETRIC TOPOLOGY
EPSRC/LMS short course

This Course will be held at Warwick University from 30 August to 3 September 1999, with funding from EPSRC and the London Mathematical Society.

The course will be aimed at graduate students who wish to work in algebraic or geometric topology, algebraic geometry, global analysis or a related area. It will cover some of the more important topics and methods of algebraic and geometric topology, and give an idea of some of the main themes of current research in this area. There will be 3 courses of 5 lectures each, accessible to beginning research students (including those beginning research in October 1999), but of benefit to all research students:

- **Algebraic Topology** (E.G. Rees, Edinburgh)
- **Characteristic Classes** (J.D.S. Jones, Warwick)
- **Smooth Four-dimensional Manifolds** (R. Kirby, Berkeley)

There will also be 'trouble shooting' sessions and a few individual lectures introducing current research topics.

It is anticipated that there will be a registration fee (yet to be determined). EPSRC supported students should expect that this will be paid from RTSG funds. Funds are expected to be made available to cover the accommodation and subsistence costs, but not the travel costs, of a number of research students at UK universities (including those beginning in October 1999). Numbers will be limited and preference will be given to early applicants.

Further details may be obtained from Professor J.D.S. Jones, Mathematics Institute, University of Warwick, Coventry CY4 7AL. Full details of this Short Course will be given in the June *Newsletter*.

PROGRAMME AND CONFERENCE FUND

Members are reminded that the Society's Programme and Conference Fund is used to provide conference grants, grants to visitors to the UK (Scheme 2), grants to support joint research groups (Scheme 3), collaborative small grants (Scheme 4) and Scheme 5: International Short Visits. The fund is administered by the Society's Programme Committee. Information about the various schemes was given in the January 1999 Newsletter (No. 267), and is also on the Society's home page on the world wide web (http:www.lms.ac.uk/grants/). The Meetings and Membership Secretary, Dr N.M.J. Woodhouse, will be pleased to discuss proposals informally with potential applicants and to give advice on submission of an application to the Society. He can be reached at: Mathematical Institute, 24-29 St Giles, Oxford OX1 3LB; e-mail: nwoodh@ maths.ox.ac.uk.ac.uk; tel: 01865 277943.

There is a deadline of 31 May 1999 for conference grant applications, and for Scheme 3 and Scheme 4 grant applications; these applications will be considered in June. There are no deadlines for Scheme 2 and Scheme 5: International Short Visits, but these should be made two to three months before the proposed visits, to allow for consideration by Programme Committee and subsequent publicity in the Newsletter. Please bear in mind, however, that applications for Scheme 2 and Scheme 5 grants, which are received after 31st May 1999, will not be considered until September.

IMPORTANT ANNOUNCEMENT!

Previously, the procedure for authors wishing to submit a paper to the *Proceedings*, the *Journal* or the *Bulletin* of the LMS has been to send the paper direct to a member of the editorial Advisory Board. THIS PROCEDURE HAS NOW BEEN CHANGED. The Society has instituted a centralised submission procedure, which will enable us to keep better track of the progress of papers submitted to these periodicals.

Authors wishing to submit a paper for publication should send two copies to the Publications Manager, London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HP. Submissions must include an accompanying letter stating:

(a) the title and author(s) of the paper,
(b) the full address details of the corresponding author, including e-mail address,
(c) the name of the Editorial Advisor whose interests are judged to be closest to its subject, and
(d) whether a LaTeX file of the paper is available (DO NOT send this file on submission).

Alternatively, authors may now submit papers electronically as Postscript or PDF files. The file may be sent via anonymous ftp to ftp.lms.ac.uk/pub/bjp-submissions. In addition, an e-mail, alerting the LMS that a submission has been made, should be sent to publications@lms.ac.uk confirming the author's intention that the paper be considered for publication. The information outlined in the previous paragraph should also be supplied in the e-mail. An acknowledgement via e-mail will be sent once it has been confirmed that the file is printable.

These procedures can be found on the LMS website at http://www.lms.ac.uk/publications/submission.html along with other useful guidelines for authors.

Separate procedures apply for submissions to the LMS Journal of Computation and Mathematics. These can be found on the journal webpage at http://www.lms.ac.uk/jcm.

E.C. Lance
Publications Secretary

NOMINATING COMMITTEE

The By-Laws of the Society place an obligation on the Council to make nominations for all the vacancies which arise at each Annual General Meeting. Although other members of the Society may make nominations and are invited to do so, in recent years it has been rare for anyone other than a Council nominee to be elected, and

indeed most elections have been uncontested. This has resulted in some questions from members about how democratic elections to the Council really are.

Following responses to articles in the *Newsletter* and debates at Council meetings, a Nominating Committee is being set up. Its main task will be to make nominations for vacancies for both Officers and Members at Large of Council after wide consultations. As there is insufficient time to establish an elected committee before this November's elections, this year its members will be chosen by Council. The first committee will have 6 members, but over the next two years its size will increase to 8, and 6 of these will be elected by the general membership of the Society. Initially the Nominating Committee will report through Council, but when the best way of operating becomes clear its position will be formalized in the By-Laws.

This year the Nominating Committee will be chaired by Professor J.M. Ball. The Committee will be inviting nominations from members of the Society in a future advertisement in the *Newsletter*.

J.S. Pym
Council and General Secretary

SINGLE TRANSFERABLE VOTE

The Council, the LMS's governing body, is elected by the Society's members. That should ensure that it is representative of the general membership, but two things currently work against this. First, Council elections are rarely contested, so that the electorate does not have a choice; this matter will be tackled by the new Nominating Committee announced elsewhere in this *Newsletter*. Second, the present elections, run on 'first past the post' principles, are not well-designed to achieve this aim (51% of those voting can win all the seats and exclude other interests). Following consultation through *Newsletter* articles, Council wishes to introduce a Single Transferable Vote system starting with the elections in the coming November.

There are many different ways of conducting an STV election. The version the Council proposes to adopt is known as Meek's method. It has the approval of the Electoral Reform Society and is used by other reputable organisations such as the Royal Statistical Society. The full details are rather complicated, so only basic principles are described briefly at this point (a fuller explanation is given below). From an elector's point of view, the system is simple: numbers have to be placed against candidates' names on the ballot paper to indicate the voter's order of preference (equal rankings are allowed, and not all candidates have to be given a rank). Two basic principles govern the counting. First if a candidate needs v votes to be elected but actually has $n > v$, then a fraction $(n - v)/n$ of each of these votes is passed on to candidates ranked lower on the relevant ballot paper. Naturally this means that some 'votes' have become fractional, but this causes no problems. Secondly if, after the above procedure has been iterated as far as possible, there are still vacant seats, all the votes of the candidate with the lowest total vote are redistributed in the same way. (If two candidates are tied at the lowest vote, one is chosen by a random process.) The precise method by which the redistribution is carried out is described below.

The Society's Charter and Statutes do not specify any particular method of election, so that an STV procedure could be used in November simply by changing the By-Laws at a General Meeting. However, attendance at General Meetings of the Society is typically low, and may not be representative of the Society as a whole. The best way of consultation is through this *Newsletter* article. Members are urged to send comments on this matter, particularly if they are critical, to the Council and General Secretary (j.pym@shef.ac.uk; John Pym, Department of Pure Mathematics, University of Sheffield, Sheffield S3 7RH).

If the use of STV is successful, it will be incorporated in the By-Laws in due course. However, the present regulations only allow electors to vote for candidates. Elsewhere in this *Newsletter* is an announcement of a General Meeting to be held in June to consider changes which will allow STV to be tried in November without specifying a particular method. Two

revisions to By-Laws are suggested. One simply allows electors to express an order of preference for candidates. The other is to allow more time for processing votes. The counting of votes is complicated since a large proportion of votes are split into fractions and partly transferred, and there are potentially a large number of iterations of the procedure needed, so a computer is almost essential. The Society's Statutes do require (i) that members should be allowed to vote at the Annual General Meeting and (ii) that the result of the elections should take effect immediately. Potential delays in using STV come not from processing the votes but in feeding the information into the computer. To ensure that there is sufficient time during the course of the AGM, we must require that postal votes are received a week beforehand so that they can be computerized in advance.

A more detailed account of the counting procedure.

1. Each candidate, at any stage of the election, is either elected, hopeful or excluded. Initially, everyone is hopeful.
2. At each stage of the count, each candidate x has an associated weight w_x. At this stage the candidate keeps a proportion w_x of any vote or fraction of a vote received, and the remaining proportion $(1 - w_x)$ is passed on to another candidate. Excluded candidates have weight 0, so keep nothing. Hopeful candidates have weight 1 and keep everything which is passed to them. Elected candidates have weights between 0 and 1 determined as in §4.
3. If on a ballot paper a candidate a is ranked first, b second, c third and so on, then at any stage a receives from that elector w_a of the vote, b receives $(1 - w_a)w_b$ of the vote, c receives $(1 - w_a)(1 - w_b)w_c$ of the vote, and so on. Notice that if any candidate listed is hopeful, all fractions transferred to later candidates are 0. If any part of the vote remains to be passed on after the whole list has been dealt with (which could happen easily if the ballot paper ranks only one candidate), that part is counted as *excess*. Initially there is no excess.
4. The *quota* - the vote a candidate must exceed at any stage in order to be elected - is defined to be (*total votes - total excess*)/(*number of seats* + 1). The *weights* for elected candidates at each stage are determined (uniquely) by the requirement that the vote which remains with each of them is equal to the current quota; these weights are calculated by an interative procedure.
5. At each stage the quota and weights are calculated according to §4, and then the procedures of §§2,3 are applied. Any candidate with more than the current quota of votes is declared elected and retains this status thereafter. If this means that at least one hopeful candidate changes to an elected candidate, the procedure is repeated.

If no hopeful candidate was elected in §5, the hopeful candidate with the lowest total vote at this stage (or one such chosen at random if there are many) is declared excluded, and the procedure is repeated with that candidate's weight changed to 0.

When the total number of elected candidates is equal to the total number of seats the process stops.

Notes.

(a) The description above is essentially taken from the paper *Single transferable vote by Meek's method* by I.D. Hill, B.A. Wichmann and D.R. Woodall (Computer J 30 (1987) 277-281), where more details are presented. I am very grateful to David Hill and Douglas Woodall for much advice on STV.

(b) All electoral systems have disadvantages. A simple illustration of this can be found in D.R. Woodall's *An impossibility theorem for electoral systems*, Discrete Math 66 (1987) 209-211 and much more comprehensive results in his *Monotonicity of single-seatpreferential election rules*, Discrete Appl Math 77 (1977) 81-98. Generally speaking the infelicities detected are unlikely to arise in practical situations.

J.S. Pym
Council and General Secretary

LONDON MATHEMATICAL SOCIETY

NOTICE OF GENERAL MEETING

There will be a General Meeting of the Society on Friday 18 June at 5.00 pm in London to consider proposals to delete the existing By-Laws I.7, I.8 and I.9 and to substitute those printed below.

The overall purpose of these changes is to allow the Single Transferable Vote system to be used in November's Council Elections. The change to I.7 allows voters to express an order of preference for candidates rather than simply to vote for names from a list. This By-Law is not intended to give a detailed prescription of the voting procedure to be used; that will be done elsewhere.

The present By-Law I.8 has been obsolete for some time. It relates to an old system which allowed members to insert extra names on the ballot papers when they voted. The proposed By-Law I.8 simply copies the second part of the present I.7 (and this change is just to avoid the necessity of renumbering all subsequent By-Laws if I.8 were simply deleted).

The effect of the change to I.9 is to require postal votes for Council Elections to arrive 8 days before the Annual General Meeting rather than the present three hours. The reason for the change is to give time for the processing of postal votes under the Single Transferable Vote system. Members will still be able to vote at the AGM itself.

Text of the proposed By-Law I.7
Each member voting shall make use of the list as a balloting list by clearly indicating the member's order of preference for candidates.

Text of the proposed By-Law I.8
Each completed balloting list shall be placed inside a voting envelope addressed to "The Scrutineers, London Mathematical Society", and the envelope shall be sealed and then validated with the voter's signature and legibly written name. Any vote not validated in this way shall be held to be null and void.

Text of the proposed By-Law I.9
Members who are unable to attend the Annual General Meeting shall be allowed to vote in the election of the Council and Officers by sending their voting envelopes, duly sealed and validated, to "The Scrutineers, London Mathematical Society" to reach the Registered Office of the Society at least 8 days before the time appointed for the Meeting. Such votes will then be given by the Scrutineers acting as proxy for such Members.

J.S. Pym
Council and General Secretary

BRITISH WOMEN IN MATHEMATICS WORKSHOP 1999

The next British Women in Mathematics Workshop is to be held at ICMS, India Street, Edinburgh on September 16th and 17th 1999. Note that the title is only to indicate that the speakers will be women and the meeting takes place in Britain - there is no requirement to be either British or female in order to attend the workshop.

The meeting will commence on the 16th with a lecture at 5.00 pm (tea available beforehand), then dinner at 6.00 pm to be followed by a discussion entitled 'Hoping for a first? What can we learn from women doing undergraduate maths at Cambridge?', led by Dr Chris Mann, at 7.00 pm.

On the 17th there will be a morning of shorter talks, followed by a buffet lunch and the closing lecture. The meeting will finish about 3.00 pm.

The following have provisionally agreed to speak:

- Claude Baesens (Dynamical Systems)
- Nora Donaldson (Medical Statistics)
- Rebecca Gowers (Operational Research)
- Tan Lei (Holomorphic Dynamical Systems)
- Irene Sciriha (Graph Theory)
- Anjuilika Verma (Fluids)

Funding is available from the LMS to pay for travel expenses of research students.

Contact Dr Helen Robinson on mtx057@coventry.ac.uk or Dr Cathy Hobbs on cahobbs@brookes.ac.uk if you require further information.

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LMS CONFERENCE GRANTS

Programme Committee has recently awarded grants to support the following conferences and meetings. These are open to members. If you wish to attend, or would like more information, please contact the organiser.

Date	Title	Location	Organiser
14 May 1999	Scottish Algebra Day, 1999	Glasgow	K.A. Brown (kab@maths.gla.ac.uk)
19 May 1999	Reading One Day Combinatorics Colloquium	Reading	A.J.W. Hilton (a.j.w.hilton@reading.ac.uk)
24-26 May 1999	1999 University of Wales Pure Mathematics Colloquium	Gregynog	E.J. Beggs (e.j.beggs@swansea.ac.uk)
1 Jun 1999	Titchmarsh Centenary Meeting	Oxford	D. Edwards (edwardsd@maths.ox.ac.uk)
11 Jun 1999	One Day Meeting on Fluid Dynamics	UEA	J.A. Johnson (j.johnson@uea.ac.uk)
21-25 Jun 1999	Workshop on Singularity Theory	Warwick	C.T.C. Wall (ctcw@liverpool.ac.uk)
24 Jun 1999	STATMECH-15	King's	D. Lavis (d.lavis@kcl.ac.uk)
9-17 Jul 1999	Workshop on Computation in Group Theory and Geometry	Warwick	D.F. Holt (dfh@maths.warwick.ac.uk)
12-13 Jul 1999	Symposium in Honour of Philip Drazin	Bristol	R. Kerswell (r.r.kerswell@bristol.ac.uk)
18-28 Jul 1999	Foundations of Computational Mathematics	Oxford	A. Iserles/E. Süli (a.iserles@dampt.cam.ac.uk)
19-24 Jul 1999	Integrable Systems: Linear and Nonlinear Dynamics	Island of Islay	C. Athorne (ca@maths.gla.ac.uk)
16-17 Sept 1999	British Women Mathematicians Day 1999	ICMS, Edinburgh	H.D. Robinson (mtx057@coventry.ac.uk)
20 Sept 1999	One Day Function Theory Meeting	UCL	J.M. Anderson (ucahoff@ucl.ac.uk)
20-21 Sept 1999	Mathematical Modelling of Nonlinear Systems	Leeds	D.B. Ingham (amt6dbi@leeds.ac.uk)
23-25 Sept 1999	British Logic Colloquium	Gregynog	A. Dawar (anuj.dawar@cl.cam.ac.uk)
10-15 Apr 2000	Harmonic Maps and Curvature Properties of Submanifolds, 2	Leeds	J.C. Wood/S. Carter (j.c.wood@leeds.ac.uk)

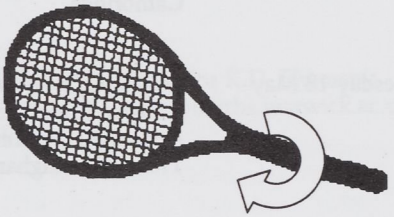
LONDON MATHEMATICAL SOCIETY

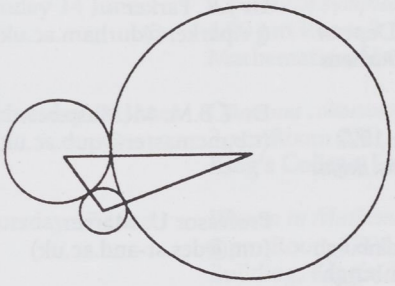
1999 POPULAR LECTURES

Liverpool University - Tuesday 8th June
Strathclyde University - Thursday 17th June
Institute of Education, London University - Tuesday 22nd June

Dr Frank Berkshire,
Imperial College
Floating, Spinning, Tumbling

How do objects like to float, tennis racquets spin and polyhedral dice come to rest? Order and chaos in action!





Professor Caroline Series,
University of Warwick
Tangent Circles - Patterns and Packings

Patterns of tangent circles have led to geometrical problems from Ancient Greece to Meiji Japan. Classical geometry has much to say about this, but the full solution is a wonderful 20th century idea.

LIVERPOOL Commences at 2.30 pm, refreshments at 3.30 pm, ends at 5.00 pm. Admission is free. Enquiries to Dr I. R. Porteous, Department of Mathematical Sciences, University of Liverpool, L69 3BX. (tel: 0151 794 4066/4043, e-mail: porteous@liverpool.ac.uk)

STRATHCLYDE Commences at 2.00 pm, refreshments at 3.00 pm, ends at 4.30 pm. Admission is free. Enquiries to Professor A. McBride or Dr P. Davies, Department of Mathematics, Strathclyde University, Livingstone Tower, 26 Richmond Street, Glasgow G1 1XH. (tel: 0141 548 3647/3416, e-mails: a.c.mcbride@strath.ac.uk, penny.davies@strath.ac.uk)

LONDON Commences at 7.00 pm, refreshments at 8.00 pm, ends at 9.30 pm. Admission is free, with ticket. Apply by June 18th to Miss S. M. Oakes, London Mathematical Society, 57-58 Russell Square, London WC1B 4HP. (E-mail: lms@lms.ac.uk) A stamped addressed envelope would be appreciated.

(These lectures are organised jointly with the Edinburgh Mathematical Society

LONDON MATHEMAT
1999 HARDY LE

The 1999 Hardy Lecturer, Professor Dusa McDuff

Day	Topic/Time/Location	Contact Person
Monday 17 May	*Sympletic 4-manifolds* 5.00 pm Isaac Newton Institute, **Cambridge**	Professor W.B.R. Lickorish (wbrl@dpmms.cam.ac.uk)
Tuesday 18 May	*A survey of sympletic topology* 4.30 pm Bridge Lecture Theatre Arkwright Building, Nottingham Trent, **Nottingham**	Professor D. Applebaum (dba@maths.ntu.ac.uk)
Thursday 20 May	*A survey of symplectic* 4.00 pm Room P/L001, Physics/ Electronics Building, **York**	Professor A. Sudbery (as2@york.ac.uk)
Friday 21 May	*Symplectic 4-manifolds* 4.15 pm Room CM221, Dept of Mathematical Studies, **Durham**	Dr J.R. Parker (j.r.parker@durham.ac.uk)
Monday 24 May	*A survey of symplectic* 4.00 pm Lecture Theatre 1022 David Bates Building,Queens, *Belfast*	Dr T.B.M. McMaster (t.b.mcmaster@qub.ac.uk)
Tuesday 25 May	*Women in Mathematics* 5.00 pm Royal Society of Edinburgh 22-26 George Street, **Edinburgh**	Professor U. Martin (um@dcs.st-and.ac.uk)
Wednesday 26 May	*A survey of symplectic topology* 4.30 pm Lecture Theatre 3 Appleton Tower, George Street (EMS), **Edinburgh**	Dr P. Heywood (philip@maths.ed.ac.uk)

All interested are very welcome to attend any of the lectures given by with the contact person listed above. General enquiries about Prize Dr D.J.H. Garling (garling@lms.ac.uk) or the Administrator at

ATICAL SOCIETY
LTURE TOUR

Dr tonybrook) will give the following lectures:

Day	Topic/Time/Location	Contact Person
Monday 7 June	*A survey of symplectic topology* 3.45 pm Room 3E2.1, **Bath**	Dr F.S. Burstall (feb@maths.bath.ac.uk)
Wednesday 9 June	*A survey of symplectic topology* 4.00 pm Place Room M12, Mathematics Institute, **Warwick**	Professor K.D. Elworthy (kde@maths.warwick.ac.uk)
Friday 11 June	*Quantum cohomology* 3.10 pm Videoconference Suite School of Mathematics, **Bangor, Wales**	Dr T. Porter (mas013@bangor.ac.uk)
Monday 14 June	*A survey of symplectic topology* 4.00 pm Room 2.16, Dept of Mathematics, **Manchester**	Dr R. Sharp (sharp@ma.man.ac.uk)
Wednesday 16 June	*Quantum cohomology* 3 pm Room 27C, Main Building **King's College, London**	Dr W. Harvey (w.harvey@kcl.ac.uk)
Thursday 17 June	*Women in Mathematics* 4 pm Room 1B06, Strand Building, **King's, London**	Dr Alice Rogers (alice.rogers@kcl.ac.uk)
Friday 18 June	*Symplectic topology today* 5.00 pm (Hardy Lecture) Gustave Tuck Lecture Theatre **University College, London**	Dr D.J.H. Garling (garling@lms.ac.uk)

ny the Hardy Lecturer. It is advisable to check the time and venue
ssor McDuff's visit may be directed to the Executive Secretary,
akes@lms.ac.uk) at De Morgan House (tel: 0171 637 3686).

ICMS 1999 SUMMER PROGRAMME

Hamiltonian Mechanics and Small Divisors in PDEs
(23 May - 4 June)

There will be between four and six colloquium lectures associated with this Workshop (see the March issue for details of the meeting), held on the afternoons of Tuesday 25 May and Tuesday 1 June at the Royal Society of Edinburgh. Expected speakers include:

Michel Herman, Université Paris VI
Henry McKean, Courant Institute
John Mather, Princeton
Alan Newell, Warwick

The Dynamics of Thin Fluid Films
(11 - 14 July)

Principal Organiser: S K Wilson (Strathclyde)
Scientific Committee: B R Duffy (Strathclyde), M Grinfeld (Strathclyde), L M Hocking (Imperial College London), O E Jensen (Cambridge), J R King (Nottingham), J Ockendon (OCIAM), D F Parker (Edinburgh), M.D. Savage (Leeds), S D R Wilson (Manchester)

The aim of this workshop is to provide a forum for pure and applied mathematicians, engineers and physicists to present the current developments in their field and to work together to address some of the outstanding problems.

The meeting will take place at 14 India Street, immediately after the International Congress on Industrial and Applied Mathematics. Places are limited and anyone interested in attending should contact Dr Wilson as soon as possible (s.k.wilson@strath.ac.uk).

Geometry and Physics of Monopoles
(23 August - 4 September)

Organisers: Jerome Gauntlett (Queen Mary & Westfield College), Nigel Hitchin (University of Oxford), Nicholas Manton (University of Cambridge) and Michael Singer (University of Edinburgh).

This Workshop, which will take place in the Kings Buildings, the University of Edinburgh, aims to stimulate discussion between mathematicians and physicists with common interests and to open up key areas of future research. The title of the meeting is interpreted in a broad sense and is deemed to include the classical theory of non-abelian magnetic monopoles, the impact of recent developments in string theory on monopoles and related topics, their role in supersymmetric quantum field theories, and related mathematical subjects such as hyperKaehler and quaternionic geometry.

Information on expected participants and a registration form are available on the ICMS Web pages.

For full information on these and other ICMS events, please consult the website
http://www.ma.hw.ac.uk/icms/1999/index.html
or call the ICMS office (0131 220 1777)

REALWORK

EPSRC/LMS MathFit Workshop on

COMPLEXITY AND EXACT COMPUTATION OVER THE REAL NUMBERS

A three-day workshop, jointly sponsored by the EPSRC and the LMS under the MathFit Programme, will be hosted by the Department of Computer Science at Royal Holloway, University of London from 10 to 12 July 1999. The workshop is particularly aimed at PhD students who would like to know more about the subject, although any interested participants are welcome. Registration and accommodation are free for EPSRC students.

The workshop brings together two key areas in computation of real numbers: Exact Real Computation and Complexity of Real Computation. Introductory courses will be presented by leading researchers in these two fields.

Complexity of real computation

Pascal Koiran (ENS Lyon) Machines over the Reals - Exact and round-off computations - Basics in complexity (NP-completeness) - Condition numbers in perturbation, round-off, and complexity

Felipe Cucker (Universitat Pompeu Fabra, Barcelona) Randomized algorithms - Complexity of geometric problems (dimensions of algebraic varieties and semi-algebraic sets) - Transfer theorems for the 'P = NP?' problem.

Exact real computation

David Lester (Manchester) Implementation of exact real computation - Constructive real analysis - Functional languages

Klaus Weihrauch (FernUniversität Hagen, Germany) Exact Real Computation and Real Complexity

Computations involving real numbers are handled in microprocessors, in calculators, in programming languages, and in numerical software by approximation, whether it be fixed precision or, as in some numerical software, arbitrary precision. Such calculations are based upon binary or decimal representations of numbers. Over the last 25 years or so, an alternative approach to real computation has been developed, called exact real computation, in which results are generated exactly, without approximation. Systems for exact real computation have been built based upon alternative representations of real numbers, especially continued fractions. However, although such systems have been around for a while they have often been viewed as a curiosity, and mainly of research interest. The state of the art, as developed at several sites around the world, including Imperial College and Manchester University in the UK, is moving towards exact systems which could be used to replace the traditional approximate systems. Indeed various industrial organisations, such as the Numerical Analysis Group (NAG Inc) are showing interest in using such systems in numerical and simulation software, as well as in Computer Algebra Systems.

However, for exact systems to be fully developed there are several remaining areas to be understood and implemented. Traditionally, such systems have focused on arithmetic. Extending exact computation to differential and integral calculus, and to solutions of differential equations, requires new techniques, including an understanding of the semantics of such systems and also the notions of constructivity involved and the relevant logics and algebraic framework. A quite different aspect is that of efficiency of exact systems. To what extent can they match the present numerical systems in terms of performance?

This is not an easy question. There is efficiency in the demand-driven nature of exact systems, but most implementations are orders of magnitude slower than inexact systems. Moreover, there is a question whether efficient methods from numerical

analysis, such as adaptive methods, can be used to provide a reasonable performance for exact calculus. A great deal of expertise about efficiency of implementation of exact systems has been developed but no systematic understanding of the area has yet emerged.

Recently, however, there has been an explosive growth in the study of the complexity (ie measures of efficiency) of computation involving real numbers. Complexity traditionally has been used to count numbers of operations in algorithms that are mainly of a combinatorial nature. Generalising complexity theory to computations involving real numbers has been a relatively recent development, in which many of the standard complexity theory concepts take on a very different flavour. We will give four examples of the types of problems considered:

- Characterize the power of real machines over binary inputs. This is closely related to the study of the power of analog neural nets.
- Characterize the power of randomization.
- Characterize the complexity of specific computational problems.
- Characterize complexity classes by means of logic.
- Prove the equivalence of different models of continuous computation, in order to strengthen the 'Church-Turing thesis for continuous computation'.

A recent book *Complexity and Real Computation* by L. Blum, F. Cucker, M. Shub and S. Smale (1997), sets out this new topic and is the best reference for the area.

By bringing together those interested in either of these two fields, the workshop will enable participants to learn sufficient about each other's fields to make progress in developing systematic approaches to the efficiency of exact computation, and also to bring to those working in real complexity some of the practical issues involving the efficiency of exact computation. The workshop will function mainly as a tutorial on both topics, together with discussions in which interactions between the two topics will be developed.

Royal Holloway, University of London, is easily accessible from London, the M25, and Heathrow Airport. En-suite accommodation in single study bedrooms is provided in the newest hall of residence on campus, and all refreshments and meals, from lunch on Saturday to lunch on Monday, including a dinner in the famous Picture Gallery, are included in the price of £115 per person. Support by the EPSRC and LMS for EPSRC-funded research students and other research students (all costs, plus assistance with travel costs) is available on a first-come-first-served basis - so immediately check your eligibility and secure your place!

The Workshop starts at midday on Saturday 10 July and closes mid afternoon on Monday 12 July. The material will be presented in a series of one-hour sessions, and the two tracks will run through the period of the workshop. The organisers are David Rydeheard (david@cs.man.ac.uk), Simon Thompson (S.J.Thompson@ukc.ac.uk) and John Shawe-Taylor (jst@dcs.rhbnc.ac.uk).

To book a place at the Workshop complete the registration form, send it by e-mail to J.Hales@dcs.rhbnc.ac.uk or fax to +44-1784-439786 (Janet Hales). The organisers wish to thank the Engineering and Physical Sciences Research Council and the London Mathematical Society for their financial support, particularly in assisting research students to participate in the Workshop.

NORMAN RILEY'S RETIREMENT

A fluid dynamics symposium in honour of Norman Riley's retirement will be held at the School of Mathematics at the University of East Anglia on 11th June 1999. The symposium is supported by The London Mathematical Society. The following lectures will be given:

Don Hurle	Mathematics of crystal growth

Adam Wheeler	A brief history of research on convection during crystal growth from the melt
Keith Moffatt	Stokes damping of Euler's disk
David Needham	A unified theory for alluvial dynamics, ripples, dunes and roll waves
Norman Riley	Acoustic streaming in an inviscid fluid

Further details may be obtained from Professor John Johnson, School of Mathematics, University of East Anglia, Norwich NR4 7TJ or by e-mail (j.johnson@uea.ac.uk).

DEPARTMENTAL NEWS

Surrey University Peter Ashwin has been promoted to Reader in Mathematics at the University of Surrey with effect from 1st April 1999. Dr Ashwin was formerly a Lecturer in Mathematics at Surrey. Matthew Nicol has been appointed to the open Readership in Mathematics from 15th July 1999. Dr Nicol was formerly a Lecturer in Applied Mathematics at UMIST.

VISIT OF PROFESSOR A. Y. HELEMSKII

Professor A. Y. Helemskii, of Moscow State University (widely known for his work on the homology of Banach algebras), will be visiting Cambridge for, approximately, the month of May 1999. He is also likely to make a short visit to the University of Leeds during that period. For details of his programme, please contact Graham Allan at Cambridge, preferably by e-mail (G.R.Allan@dpmms.cam.ac.uk). The visit is supported by the LMS through a grant made under its International Short Visits scheme.

ROYAL SOCIETY RESEARCH FELLOWSHIPS

Eight scientists will be able to concentrate on full-time research as a result of their appointment to the Royal Society Senior Research Fellowships. The fellowships represent an imaginative and valuable opportunity for mid-career scientists to be relieved of all teaching and administrative duties to do full-time research, for a period of between one academic term and one year.

The scheme was launched in 1990 and a total of 52 fellowships have been awarded to date. This year's competition was keenly contested. Amongst those awarded was one to Professor Mark Pollicott, Department of Mathematics, University of Manchester, to work on decay of correlation in chaotic flows.

ROLLO DAVIDSON TRUST

The Trustees of the Rollo Davidson Trust give notice that they have awarded Rollo Davidson Prizes for 1999 to Raphael Cerf (Université Paris-Sud), for his work on geometrical probability and the large deviation theory of percolation in three dimensions, and Gareth Roberts (Lancaster), for his work on the theoretical properties of simulation procedures, including Markov chain Monte Carlo, important in the Bayesian paradigm in statistics.

VISIT OF PROFESSOR S. RAMANAN

Professor S. Ramanan (TIFR Bombay) is visiting W.M. Oxbury at the University of Durham during the period 6 - 20 June 1999, under a Scheme 5 LMS grant, to work on vector bundles on algebraic curves. He will also visit the University of Oxford during the week 14 - 18 June. Further details are available from Dr Oxbury (w.m.oxbury@durham.ac.uk).

GREGYNOG PURE MATHS COLLOQUIUM

The colloquium will take place at Gregynog Hall (near Newtown, Powys), beginning at teatime (4 pm) on the 24th May, and ending after lunch (1:30) on the 26th. The proposed list of speakers for 1 hour talks is:

- A. Balinsky (Cardiff)
- S. Donkin (QMW, 2 talks)
- K.D. Elworthy (Warwick, 2 talks)
- J. Gunawardena (BRIMS)
- P. Lochak (Paris)
- M. Nazarov (York)
- L. Schneps (Paris)

The meeting is organised jointly by the mathematics departments of the University of Wales, and most of the participants will be from those departments. Anyone who would like to attend from outside the University of Wales will be very welcome, and should contact Edwin Beggs at Swansea (E.J.Beggs@swansea.ac.uk) by 10th May. Unfortunately the organisers are unable to give financial support to outside participants, so they would have to meet the cost of two days full board at the hall (total £85) themselves, and places will be allocated on a first come, first served basis due to limited accommodation. There is also accommodation in nearby towns. The organiser would like to thank the LMS for its support of this meeting.

BOOK REVIEW

The Mathemagician and Pied Puzzler: A collection in tribute to Martin Gardner edited by Elwyn Berlekamp and Tom Rodgers, 280 pp, 1999, £22, $34, ISBN 1-56881-075-X (A.K. Peters, Natick MA).

This book contains papers from G4G1 - the "First Gathering for Gardner" in 1993 (there have since been two further gatherings). The collection includes autobiographical glimpses of the man himself.

- 'Martin Gardner has had no formal education in mathematics, but he has had an enormous influence on the subject' (p.ix).
- 'Gardner was intrigued by geometry in high school, and wanted to go to Caltech to become a physicist [... instead he] went to the University of Chicago [which, at that time] decreed that everyone should have a broad liberal education' (p.4)
- 'After I had graduated and spent another year at graduate work. I decided I didn't want to teach. I wanted to write.' (p.5)
- 'Gardner was asked to do a monthly column [in Scientific American]. "At that time, I didn't own a single math book," he recalls. "But I knew of some famous math books, and I jumped at the chance."' (p.8)
- 'I can't think of any definition of 'mathematician' or 'scientist' that would apply to me. I think of myself as a journalist who knows just enough about mathematics to be able to take low-level math and make it clear and interesting to non-mathematicians. Let me say that I think not knowing too much about the subject is an asset for a journalist, not a liability.' (p.9)

Though Gardner has wisely avoided (until recently) getting involved in debates about school mathematics, this last quote - like much of what he writes - has implications for how the subject is best learned and taught.

Carl Pomerance goes a step further:

- 'It was in high school that I decided to be a mathematician. The credit (or, perhaps, the blame!) for this can be laid squarely on mathematical competitions and Martin Gardner. The competitions led me to believe that I had talent, and for an adolescent unsure of himself and his place in the world, this was no small thing. But Martin Gardner, through his books and columns, led me to the more important lesson that, above all else, mathematics is fun. The contrast with

my teachers in school was striking. In fact there seemed to be two completely different kinds of mathematics: the kind you learned in school and the kind you learned from Martin Gardner. The former was filled with one dreary numerical problem after another, while the latter was filled with flights of fancy and wonderment. [...] now I see the other side of the story. Technical proficiency is a worthy goal, and when my students need to know, say, the techniques of integration for a later course, I would be remiss if I didn't cover the topic. But I know that the driving engine behind mathematics is the underlying beauty and power of the subject and that this is indeed the reason why the subject is worth studying.' (p.19)

Most of the contributions discuss specific puzzles, magic tricks, or interesting bits of recreational mathematics. Like all collections of conference papers, this one is a mixed bag, but Gardner fans will probably find enough to satisfy them - even if the effect on this reviewer was to underscore the craftsmanship which characterises Gardner's own collections. Nevertheless, it is good to catch a glimpse of the range of professionals - from the worlds of mathematics and computing (e.g. Donald Knuth, Richard Guy, Sol Golomb, Bill Gosper, Jeffrey Lagarias), and from the worlds of puzzles and magic - who have supported and fed Gardner's writings over the years. We owe them all a huge debt.

Tony Gardiner
University of Birmingham

WORKSHOP ON HILBERT'S 10TH PROBLEM, RELATIONS TO ARITHMETIC AND ALGEBRAIC GEOMETRY

From 2 to 5 November 1999 a workshop on "Hilbert's 10th problem, relations with arithmetic and algebraic geometry" will be held at the University of Gent (Belgium). The scientific committee consists of Jan Denef, Leonard Lipshitz, Thanases Pheidas and Jan Van Geel. The main theme of the meeting will be the relation between decidability problems, arithmetic and algebraic geometry. The scientific committee hopes that bringing together number theorists, algebraic geometers and logicians will provoke discussions and set directions for future research related to Hilbert's original question.

Apart from selected research lectures, presenting recent results in the field, there will be 3 or 4 series of lectures with an instructional character selected among the following topics:

- Work on Hilbert's 10th problem, for various rings and fields, over the past decades.
- Some model theoretic aspects and related decidability problems. Decidability for certain generic diophantine problems and for fragments of arithmetic.
- The algebraic geometric structure of Diophantine families. Mazur's conjectures on the topology of rational points.
- Computational aspects. Work of Rojas on (un)computability of bounds for integral points and the $\exists\ \exists\ \forall\ \exists$ diophantine problem.
- Complexity of diophantine geometry.

People interested in the meeting should contact the local organizers by e-mail: hilbrt10@cage.rug.ac.be or by ordinary mail to Jan Van Geel or Karim Zahidi, Department of Pure Mathematics, University of Gent, Galglaan 2, B-9000 Gent, Belgium (fax. 32 - (0) 9 - 264 49 93).

Although we invite all people who are interested in the topics to apply, the number of participants will be limited in order to maintain the character of the meeting. Further information on the workshop and on its location can be found at: http://cage.rug.ac.be/~hilbrt10/hilbert10.html. There one can also find an updated list of participants.

EC Summer School and Concentration on MATHEMATICAL DEVELOPMENTS IN MODELLING MICROSTRUCTURE AND PHASE TRANSFORMATIONS IN SOLIDS

6-18 and 20-24 September 1999

The Summer School and Concentration will kick-off the programme Mathematical Developments in Solid Mechanics and Materials Science. The recent years have seen much advance in the mathematical aspects of materials science and solid mechanics. Materials science and solid mechanics have posed interesting questions in mathematics and in turn mathematical analysis has brought new insights in these areas. The key issue is how the microscopic structure of a solid material influences its macroscopic response to stimuli like stress and magnetic field, and conversely how the application of macroscopic loads influences the microstructure. In particular, phase transformations, damage and fracture may occur, creating structures at various length scales which can evolve with macroscopic stimulus. The challenge, both for mathematics and physical modelling, is to comprehend relationships between models at different length scales. This has led already to well-developed theories in static or equilibrium situations. Length scales can be linked using the theory of "homogenization" when the scales are widely separated, and the formation of microstructure can be addressed using a class of variational problems that do not admit classical solutions, but only those which are highly oscillatory.

Mathematical tools for describing microstructure have been developed and these have been used to study the link between microstructure and macroscopic properties. Yet challenges remain, and these have inspired different approaches. Much of this development has been at the continuum level and linking it to the atomistic length scales is a continuing theme. Some phenomena may be unstable, at least at the microscopic level, and, even if stable, may admit multiple equilibria. Therefore, the study of the kinetics of the processes is a key requirement, making demands for modelling, for computation and for the analysis of partial differential equations. In particular, the (possibly hierarchical) development of large-scale patterns is an important challenge.

The EC summer school will be for two weeks, 6-18 September 1999. The first week consists of four sets of expository lectures by

G Allaire (Paris VI)	Homogenization and Applications to Materials Science
M Finnis (Belfast)	Atomistic Models
S Müller (MPI, Leipzig)	Mathematics of Microstructure
E Van der Giessen (Delft)	Damage and Fracture Mechanics

The second week surveys the latest developments and the speakers are expected to include

R Abeyaratne (MIT)	L B Freund (Brown)	V Nesi (Rome)
M Berveiller (Metz)	G Friesecke (Oxford)	F Otto (UCSB)
H Bhadeshia (Cambridge)	R D James (Minnesota)	E Salje (Cambridge)
K Bhattacharya (Caltech)	D Kinderlehrer (CMU)	D Schryver (Antwerp)
L-Q Chen (Penn State)	P Leo (Minnesota)	B Spencer (SUNY Buffalo)
A DeSimone (MPI Leipzig)	M Luskin (Minnesota)	P Voorhees (Northwestern)

This will be followed by a concentration for a week, 20-24 September 1999, during which the speakers above and other experts will be in residence enabling less formal presentations, discussions and talks.

The Summer School (6-18 September) is supported by the European Community and funding is available to support some young researchers. It is intended for nationals of EC member States and of Iceland, Lichtenstein, Norway and Israel, who must all be under 35 years of age. Limited funds exist for other participants. Self-supporting participants of any age and nationality are welcome to apply.

The School and Workshop will take place at the Newton Institute and accommodation for participants will be provided at New Hall for the first week, and Wolfson Court for the following two weeks. The conference package for one week (Sunday evening - Saturday morning) costs £300, which includes registration fees, accommodation, breakfast and evening meals plus lunch and refreshments during the days that the school takes place. The fee for attendance at two weeks (ie 5 - 18 September) is £650, and for attendance at three weeks (ie 5-25 September) is £1000.

Information and an application form can be found at http://www.newton.cam.ac.uk/programs/smmw01.html. Completed application forms should be sent to Heather Hughes at the Newton Institute, 20 Clarkson Rd, Cambridge CB3 0EH, e-mail: h.hughes @newton. cam.ac.uk

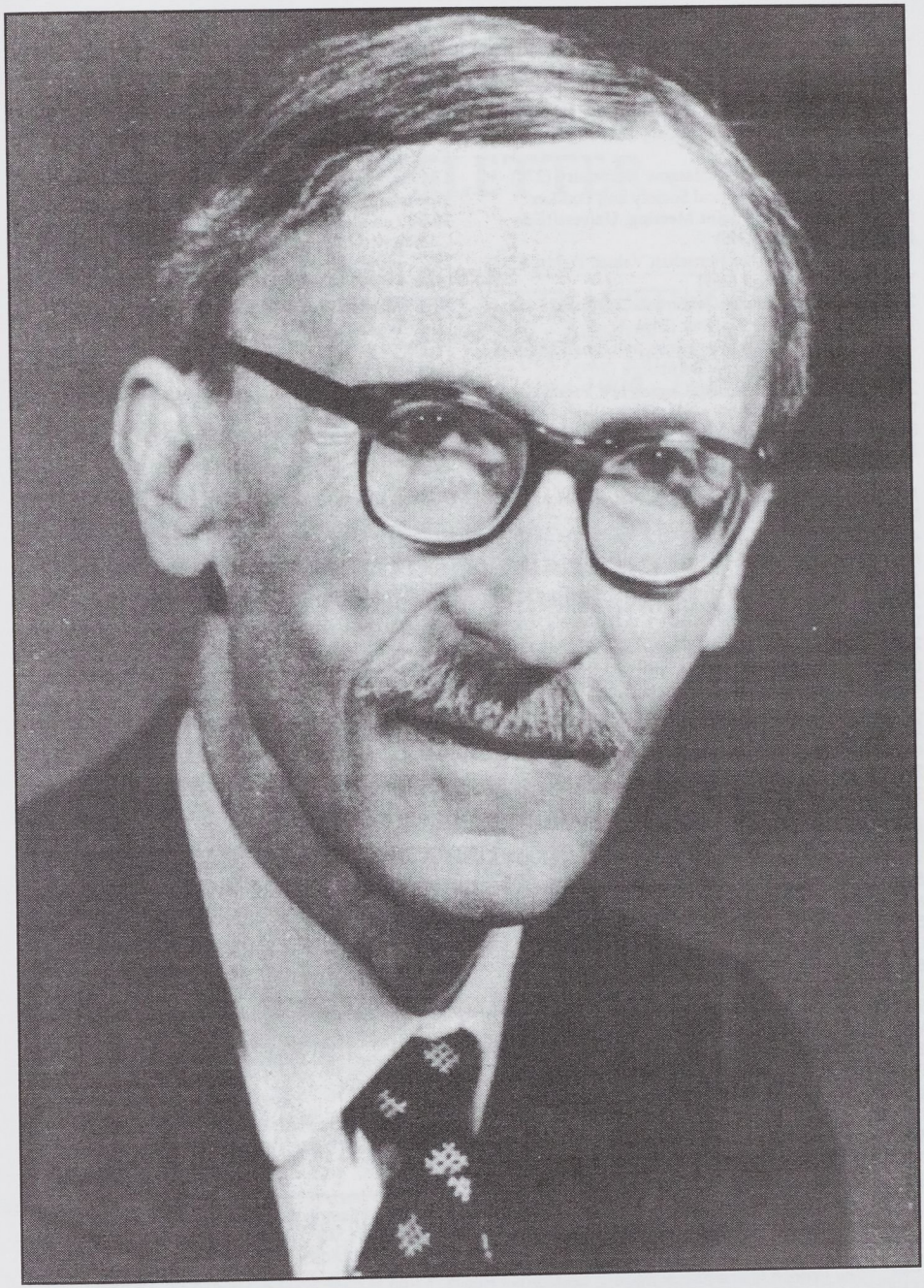
Closing date for the receipt of applications is 31 May 1999.

HYDRODYNAMIC INSTABILITIES, WAVES & GFD

A two-day meeting is being held to mark the contribution that Professor Philip Drazin has made to Geophysical Fluid Dynamics, Hydrodynamic Instability Theory and Wave Motions on the occasion of his retirement. The meeting will take place at the School of Mathematics, University of Bristol from 12 to 13 July 1999. Confirmed speakers are:

- Professor Al Barcilon (Florida State)
- Professor David Broomhead (UMIST)
- Dr David Burridge, CBE (ECMWF)
- Professor Alex Craik (St Andrews)
- Professor Mike Gaster, FRS (QMWC)
- Professor Ray Hide, FRS (Oxford)
- Professor Lou Howard (Florida State)
- Professor Julian Hunt, FRS (Cambridge)
- Dr Robin Johnson (Newcastle)
- Professor Derek Moore, FRS (Imperial)
- Professor Bill Reid (Indiana University)
- Professor Norman Riley (UEA)
- Professor Paul Roberts, FRS (UCLA)

The meeting will start at 2 pm on Monday 12th July and finish at 1 pm on Tuesday 13th July with a banquet on the Monday night. The meeting is open to all who are interested. The London Mathematical Society have offered some funds specifically to support the attendance of graduate students at the meeting. These will be distributed on a first-come-first-served principle. (Note the LMS expects matching support from home institutions so 50% support will be offered.) Please pass this information on to any interested graduate students. A completed registration form should be sent to Mrs Julie Verstraeten as soon as possible and not later than 1st June. The form available from the web site (www.maths.bris.ac.uk/~amnag/conference.htm) contains details of university accommodation and other hotels/guest houses. Additional information may be obtained from Dr R.R. Kerswell (R.R.Kerswell@bristol.ac. uk, tel: 0117-9289126 or fax: 0117-9287999).



P. LEVY
Honorary Member 1963

DIARY

The diary lists Society meetings and other events publicized in the Newsletter. For further information, refer to the figure in brackets, which is a cross reference to the LMS Newsletter number.

MAY 1999

7 Edinburgh Mathematical Society Meeting, Stirling (263)
14 Scottish Algebra Day, Glasgow University (270)
14-16 Belgian Mathematical Society and London Mathematical Society Joint Meeting, Université de Bruxelles (260)(261)(268)
16-22 Model Theory of Henselian Valued Fields, ICMS Workshop, Edinburgh (269)
21-22 Groups in Galway Conference, National University of Ireland, Galway (269)
23 - 4 Jun Hamiltonian Mechanics and Small Divisors in PDEs, ICMS Workshop, Edinburgh (269)
28-30 Differential Geometry Conference, Patras University, Greece (270)
31 North British Functional Analysis Seminar, Edinburgh University (270)

JUNE 1999

1 Titchmarsh Centenary Meeting, Mathematical Institute, Oxford University (269)(270)
4 Edinburgh Mathematical Society Meeting, Aberdeen (263)
18 LMS Meeting, Hardy Lecture, London
20-24 Number Theory Association Conference, Winnipeg, Canada (270)
21-25 Singularity Workshop, Warwick University (270)
22-25 Mathematics of Finite Elements and Applications Conference, Brunel University (269)
28 - 2 July Nonlinear Partial Differential Equations Conference, Besançon, France (268)
29 - 9 July Stochastic Analysis LMS Durham Symposia, Durham University (268)

JULY 1999

3-4 Ergodic Theory and Dynamical Systems Workshop, Warwick University (270)
5-9 International Congress of Industrial and Applied Mathematics (ICIAM 99), Edinburgh University (252)
5 -9 Quadratic Forms and Their Applications Conference, University College, Dublin (268)
6 Intuitionistic Modal Logic and Applications Workshop, Trento, Italy (270)
9-17 Computation in Group Theory and Geometry Workshop, Warwick University (270)
12-13 Skew-Products and Synchronization of Coupled Systems Workshop, Surrey University (269)
12-16 British Combinatorial Conference, Kent University (254)(268)
12-16 American Mathematical Society and Australian Mathematical Society Joint Meeting, Melbourne University (260)
12-16 System Modelling and Optimization Conference, IFIP TC7, Cambridge (267)
17 Computation in Group Theory and Geometry Workshop, Warwick University (269)
18-28 Foundations of Computational Mathematics Conference, Oxford University (270)
19-24 Integrable Systems: Nonlinear and Nonlinear Dynamics Workshop, Islay (270)
19-24 Representation of Algebras Conference, Sao Paulo University (269)
19-29 Quantum Groups LMS Durham Symposia, Durham University (268)
25-7 Aug Banach Algebras International Conference, Pomona College, California (268)
26-6 Aug Integrable Systems Seminar, University of Montreal (267)
26-6 Aug Structure Formation in the Universe, Isaac Newton Institute, Cambridge (268)

AUGUST 1999

16-27 Connecting Fundamental Physics and Cosmology, E.C. Summer School, Isaac Newton Institute, Cambridge (269)
22-29 Hall Algebras Summer School, Hesselberg, Germany (263)

SEPTEMBER 1999

11-17 British Association Festival of Science, Sheffield (270)
20-25 Modular Invariants, Operator Algebras and Quotient Singularities Workshop, Warwick University (270)

OCTOBER 1999

15-16 Two-day LMS Meeting, New Applications of Twistor Theory, London

NOVEMBER 1999

19 LMS Meeting - Annual General Meeting

APRIL 2000

17-20 British Mathematical Colloquium, Leeds University

JULY 2000

3-7 Functional Analysis Meeting, Technical University, Valencia, Spain (265)
10-14 3rd European Congress of Mathematics, Barcelona, Spain
17-22 International Congress of Mathematical Physics, Imperial College, London (257)

APRIL 2001

9-12 British Mathematical Colloquium, Glasgow University

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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