

# THE LONDON MATHEMATICAL SOCIETY NEWSLETTER

No. 258

March 1998

## FORTHCOMING SOCIETY MEETINGS

*Friday-Saturday 22-23 May 1998 - London*

Joint meeting with the Irish Mathematical Society

Complex Analysis and Dynamical Systems

*Friday 19 June 1998 - London*

C. Soulé, J.H. Coates

*Friday-Saturday 16-17 October 1998 - London*

Harmonic Analysis

## LMS COUNCIL DIARY

Taking over the job of writing the Council Diary from my predecessor, Alan Camina, was never going to be easy, but beginning with the meeting on 16 January was a baptism of fire. The agenda papers looked innocent enough, but as it turned out, major decisions were taken which will substantially reshape the Society. Apart from an immediate impact on its administration, they will in the long term influence the Society's role in the UK and international mathematical communities.

Members who read last month's *Newsletter* will know that by the time this article is in print, the Society's purchase of 57/58 Russell Square will be completed. The Treasurer, Alun Morris, took us through the closing stages of the various negotiations - alas, we were cheated of the dénouement, which came in a phone call to Alun shortly after the close of the meeting. Without going into details, suffice it to say that seldom in Council are we treated to such an insight into the workings of the corporate world. Despite the impact of commercial forces on all our universities, we still remain relatively remote from it.

The major business of the day was a discussion of changes to the Society's administrative structure. As the activities

of the Society expand, its officers' duties multiply, and for some time Council has realised that with Universities becoming increasingly sensitive about resources, it is getting harder to find officers whose departments will accept the amount of time they spend on LMS work with little recompense. We received a report from a working party, charged last year with setting up a new administrative framework. Two major new posts being created are: an Executive Secretary, who will oversee the entire administration of the Society, and relieve the Council and General Secretary and the Treasurer of much of their routine work; and a Publications Manager. The Society's publications make up its largest single activity and involve many people. Most visible to members are the editors of the journals, book reviews and book series, but several others work hard behind the scenes. The last two years have seen the conception and birth of the new, all-electronic *LMS Journal of Computation and Mathematics*, largely the result of round-the-clock work by Wilfrid Hodges (judging by his e-mails, posted at all hours of day and night). Overseeing all of this and more is the Publications Secretary, Chris Lance, who somehow manages to keep on top of



developments, whether they take place at home, across the Atlantic or (as often) in Moscow. The appointment of a full-time Publications Manager, as well as shifting the burden of administrative tasks, will allow us to expand our publishing activities, something very much in Council's mind.

Regular readers of this column will know that the Society, largely through its Education Committee, has been trying to get central government to share its concern for the teaching of mathematics in schools. This is proving to be an uphill struggle. In an attempt to reassure us, a civil servant from the DFEE recently drew our attention to a depressing report on A-level standards in mathematics. At least (or at worst) it is now recognised officially that "higher order skills such as reasoning" are no longer acquired at A-level. The challenge now is to persuade ministers to accept that this is unsatisfactory.

Not all news is bad. At the very beginning of the meeting we learnt of awards made to two well-known members of the Society: Professor Sir Michael Berry had received the Wolf Prize for Physics, and Professor Andrew Wiles (who had been nominated by the LMS) had been awarded the King Faisal International Prize for Science.

For the past few years, the Society has run a successful series of instructional conferences for postgraduates, with funding from EPSRC. It was reported that EPSRC now propose that this programme be expanded, a plan which we warmly welcomed.

This meeting marked the end of a long association: by the time you read this, the Society's offices will have moved to Russell Square. Everyone will surely miss the distinguished atmosphere of Burlington House, even if its impracticalities outweigh its charm. Next time if space permits I will try to describe in more general terms the workings of Council, for the benefit of those readers as unfamiliar with them now as I was a year ago.

Tony Scholl

## VISIT OF PROFESSOR A. LEBEDEV

Professor Andrei Lebedev, of the Belorussian State University, Minsk, Belarus, will be visiting the Department of Pure Mathematics at the University of Leeds in March 1998, supported by an LMS grant under the FSU scheme. Professor Lebedev is an expert in the use of  $C^*$ -algebra methods in the theory of functional differential equations. He will be giving a lecture to the Yorkshire Functional Analysis Seminar, and will also give seminars at the universities of Edinburgh, Aberdeen and North London. For further information, contact Professor Christopher Lance (e.c.lance@leeds.ac.uk).

## COMMUTATIVE ALGEBRA

There will be a Conference on Commutative Algebra in Honour of David Rees's 80th Year. This will take place at the University of Exeter during 13 - 16 August 1998, just before the 1998 International Congress of Mathematicians meets in Berlin. The organisers are P. Vámos (Exeter, local organiser) and R.Y. Sharp (Sheffield). Among those who have already accepted invitations to speak are C. Huneke (Purdue), D. Katz (Kansas), D. Kirby (Southampton), L. O'Carroll (Edinburgh), N.V. Trung (Hanoi), G. Valla (Genoa) and J.K. Verma (India).

The conference is supported financially by a grant from the London Mathematical Society. This will be used to cover part of the costs of attendance by the invited speakers and some graduate students. Participants from developed countries will be expected to pay a registration fee of £35. Those interested in receiving further information should send an e-mail message to [car-meet@maths.ex.ac.uk](mailto:car-meet@maths.ex.ac.uk) and/or visit the web site at [http://www.maths.ex.ac.uk/conf\\_rees.html](http://www.maths.ex.ac.uk/conf_rees.html) or contact Professor P. Vámos (Department of Mathematics, University of Exeter, North Park Road, Exeter EX4 4QE; tel: 01392 - 263984; fax: 01392 - 263997). Enquiries from graduate students are encouraged.

# LONDON MATHEMATICAL SOCIETY

## *Spitalfields Day*

Mathematics Research Centre  
University of Warwick

### **Symplectic Topology** **Wednesday, 1st April 1998**

*Organisers: Dietmar Salamon & John Rawnsley*

- 9:30-10:00 Coffee  
10:00-11:00 Dusa McDuff (Stony Brook)  
*The topology of the symplectomorphism group*  
11:30-12:30 Susan Tolman (Urbana-Champaign)  
*Hamiltonian actions on symplectic manifolds: cohomology and classification problems*  
12:30-14:00 Buffet lunch  
14:00-15:00 Michael Hutchings (Harvard)  
*Circle-valued Morse theory, Reidemeister torsion, and Seiberg-Witten invariants of 3-manifolds*  
15:00-16:00 Tea  
16:00-17:00 Karen Uhlenbeck (Austin)  
*Geometry and Integrable Systems*  
19:00 Party with the Dick Smith Blues Band

Everyone is welcome to attend, but it is requested that all participants give notice by contacting Peta McAllister ([peta@maths.warwick.ac.uk](mailto:peta@maths.warwick.ac.uk)) or Hazel Graley ([hazel@maths.warwick.ac.uk](mailto:hazel@maths.warwick.ac.uk)) at the Mathematics Research Centre, University of Warwick, Coventry CV4 7AL.

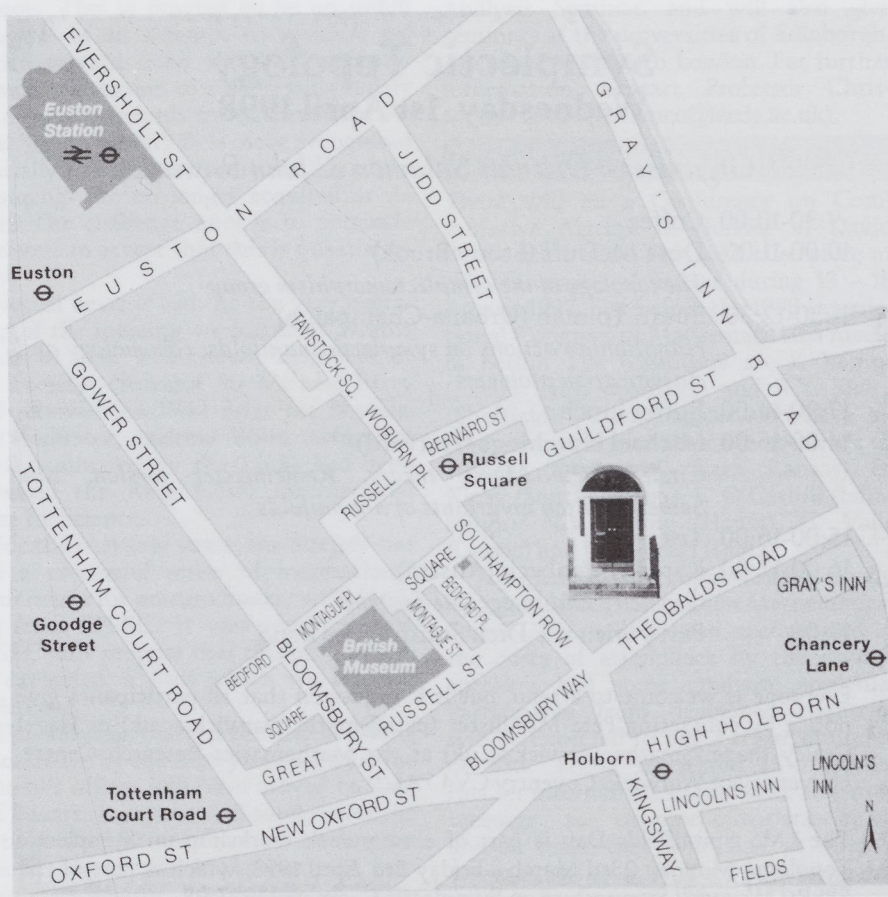
The LMS Spitalfields Day is part of a two-week workshop on Symplectic Topology, Monday 23rd March - Friday 3rd April 1998, which is part of the EPSRC Warwick Symposium on Symplectic Geometry 1997-98.

Updated information is available via the internet  
<http://www.maths.warwick.ac.uk/mrc/1997-98/>



## 57/58 RUSSELL SQUARE

The LMS Office moved to the Society's new premises on Monday 16 February 1998. The full postal address is: London Mathematical Society, 57-58 Russell Square, London WC1B 4HP; tel: 0171 323 3686; fax: 0171 323 3655. The e-mail address is unchanged ([lms@lms.ac.uk](mailto:lms@lms.ac.uk)).







## NEW POSTS IN THE SOCIETY'S OFFICES

Below there are advertisements for two new posts, Executive Secretary and Publications Manager of the London Mathematical Society. These advertisements have also appeared in the national press. Some of the developments which have led to the need for these new positions are described in the Council Diary. It is crucial to the future well-being of the LMS that first-class candidates are found, so do please bring these positions to the attention of any acquaintances who you feel might be suitable candidates. This is particularly desirable in the case of the Publications Manager, since candidates for this post are unlikely to be avid readers of the LMS Newsletter.



### Publications Manager

The London Mathematical Society (LMS), which is the leading British learned society for mathematics and has a substantial publications programme, requires a full-time Publications Manager.

This is a new post, arising through a reorganisation and expansion of the Society's administrative structure. It will be based at the newly-acquired central London headquarters of the LMS. Initially, the Publications Manager will take over and coordinate a variety of jobs currently done by the Society's honorary officers and members. In the longer term, there will be considerable scope for initiative in the development and expansion of the Society's publishing activities.

Candidates should have a degree, preferably in a scientific discipline, and some experience in publishing or printing. They should be computer literate, able to use modern office software and enthusiastic about the new possibilities for electronic publishing. Good interpersonal skills, and an ability to manage both projects and people, are essential.

Salary in the region £25,000 to £30,000.

The deadline for applications is **21 March 1998**. Further particulars are available on the Society's web site (<http://www.lms.ac.uk/jobs/pm.html>) or from the LMS Publications Secretary, Professor Christopher Lance, School of Mathematics, University of Leeds, Leeds LS2 9JT (tel. 0113 233 5142, e-mail [e.c.lance@leeds.ac.uk](mailto:e.c.lance@leeds.ac.uk)), to whom candidates are encouraged to make informal enquiries.





## Executive Secretary (Full-time or part-time)

The London Mathematical Society (LMS) requires an Executive Secretary. The LMS is the foremost British learned society for mathematics. It has over 2000 members world-wide. It is also a major mathematical publisher. Until now the Society has been run largely by volunteers from the British academic mathematical community, supported by one full-time and two part-time staff in a single rented office. The Society is now changing the way in which it operates. It is moving to its own building in central London, and intends to employ sufficient staff to do much of the work previously done by volunteers. The Executive Secretary will run the LMS under the direction of

Council and its honorary officers. He or she will also manage the change from heavy volunteer activity by academics to largely employee activity. His or her successor should be able to take over a smoothly running organization.

Candidates should be thoroughly familiar with the world of UK mathematical research, probably having worked as academics in a mathematics (or cognate subject) department at a British university or for one of the UK research councils.

Some administrative experience, such as being head of department or an officer of a learned society, would be an advantage. Computer-literacy in standard office software is essential, as is the ability to type minutes and reports.

The employment will be for a term of five years. Full-time employment is preferred, but applications will be considered from suitable candidates who can do only three or four days per week. Salary will be negotiated according to experience; it is unlikely to be less (*pro rata*) than a senior academic mathematician earns.

The deadline for applications is **21 March 1998**. Further particulars are available on the Society's web site (<http://www.lms.ac.uk/jobs/es.html>) or from the President, Professor J.M. Ball, Mathematical Institute, 24-29 St Giles, Oxford OX1 3LB (tel. 01865 273577, e-mail: [ball@maths.ox.ac.uk](mailto:ball@maths.ox.ac.uk)), to whom candidates are encouraged to make informal enquiries.



## LETTER TO THE DIARIST

The following is an extract from a letter from Professor R. Brown (Bangor) to Dr A. Camina, prompted by Dr Camina's last Council Diary, published in issue 256 of the Newsletter. It is published with the permission of Professor Brown and Dr Camina.

"The LMS is affected by the RAE since the work of people like yourself, editors, referees, etc. does not come into the assessment process. It is as if the Government is funding a car and will pay for petrol, tyres and some maintenance, but not for oil. The lack of funding for lubricant is likely to make the system seize up. Why are the LMS, Royal Society, IMA etc. not screaming (I mean talking loud and clear) about it?

I am writing as an advisor for 20 years for the LMS and a current editor of two other journals, but as far as I can see this was not considered as contributing to 'international excellence', or even to 'research'. Even the so called criteria of 'national' and 'international' excellence, and the possible methods of measurement, have problems with a subject which crosses national boundaries. We were told that talking to the BMC amounted to national excellence, but to the IMC international excellence. How many of those in grade 5 departments have given invited talks to the IMC? It is downgrading UK mathematics to say that speakers to the BMC have only done nationally excellent work. The criteria seem to imply from the start that UK mathematics is not up to international standards of excellence.

Many are eager to reinvent the aims of higher education. In fact Universities have Objects stated in their Charter, which at Bangor are 'The advancement and dissemination of knowledge through teaching and research, and the provision for its students, through its corporate life as well as its academic work, of the benefits of a University education.' Note that teaching and research are seen, sensibly, as a means rather than an end.

Writing a survey article, or a graduate text, is clearly a duty under the Charter; we know the importance of such activities for the advancement of the subject. It seems likely they do not count as 'research' as defined in the RAE. This rewriting of the aims of properly constituted bodies without going through due process, and without protest, seems to me a major illegality and scandal in the recent history of Higher Education in the UK."

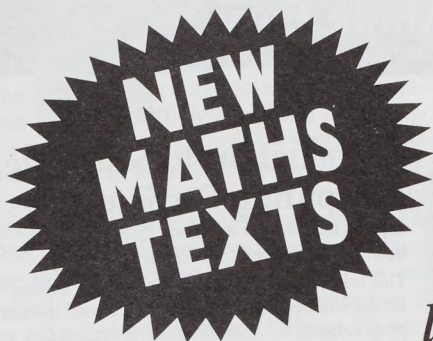
## VISIT OF PROFESSOR A.P. KATCHALOV

Professor Alexander Katchalov (St Petersburg) is visiting the UK until 17 March, under the auspices of the LMS FSU scheme. He is based at the Universities of Loughborough (where he will lecture on 6 March at 15:10) and Nottingham (where he will lecture in the Department of Theoretical Mechanics on 11 March at 16:15). Professor Katchalov will also visit OCIAM, University of Oxford. Professor Katchalov's scientific interests lie in the area of the development and application of asymptotic methods in wave propagation, with particular interest in Gaussian beams and associated techniques, and inverse problems. For further information and for confirmation of the arrangements for the seminars, contact either Dr Richard Tew ([richard.tew@nottingham.ac.uk](mailto:richard.tew@nottingham.ac.uk)) or Dr Yaroslav Kurylev ([y.y.kurylev@lboro.ac.uk](mailto:y.y.kurylev@lboro.ac.uk)).

## VISIT OF PROFESSOR I. B. ZHUKOV

Professor I. B. Zhukov, of St Petersburg University will be visiting the Department of Mathematics University of Nottingham in May 1998. His visit is jointly supported by an LMS grant under the FSU scheme and by the University of Nottingham. Professor I. B. Zhukov is a leading specialist in Galois extensions of higher local fields. He will give seminars on his recent works at the University of Nottingham, Cambridge and UMIST. Further information can be obtained from Ivan Fesenko ([ibf@maths.nott.ac.uk](mailto:ibf@maths.nott.ac.uk)).





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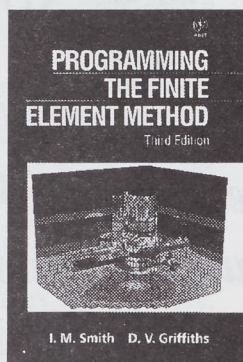
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Programming codes for each problem are featured in Fortran 90 and C, whilst a program for the solution of PDE's using the finite element method is available over the internet via anonymous ftp. This book is an ideal text for advanced undergraduate and postgraduate students of mathematics, physics, biochemistry and all areas of engineering, as well as practicing programmers in these disciplines.

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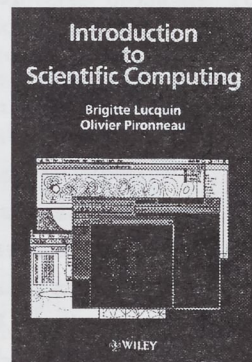
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## **ICMI STUDY**

### **On the Teaching and Learning of Mathematics at University Level**

The ICMI has recently released a Discussion Document (ICMI Bulletin 43) relating to the above Study. The work of this Study will take place in two parts. The first consists of a conference, which is to be held in Singapore from December 8-12, 1998. The conference will be a working one where every participant will be expected to be active. Current planning is for a limited attendance of about 75 persons.

Given the style of the conference, we anticipate a variety of types of contributions that will be presented in plenary sessions, working groups, panels and short presentations. Presentations may include position papers, discussion papers, surveys of relevant areas, reports of projects, or research papers of an educational nature.

We invite you to make a submission for consideration by the International Programme Committee (IPC) no later than 1 May 1998. Submissions should be up to three pages in length and may be e-mailed, faxed or sent as hard copy. They should be related to the problems and issues identified in the Discussion Document but need not be limited to these alone.

Participation in the conference is by invitation only. Invitations to those whose submissions have been accepted will be made in July 1998. At the same time invitees will be asked to produce a longer version of their submission for publication in the pre-conference proceedings. The Study organisers are seeking funds to provide partial support to enable participants from non-affluent countries to attend the conference but it is unlikely that full support will be available for any one individual.

The second part of the Study is a publication, which will appear in the ICMI Study Series. This publication will be based both on the contributions requested above and the outcomes of the conference working group and panel

deliberations.

The Discussion Document, and information relating to the conference, can be found on the ICMI website, on [www.nie.ac.sg:800/~wwwmath/](http://www.nie.ac.sg:800/~wwwmath/) and on <http://emmy.otago.ac.nz:800/math.html>.

All contributions, suggestions, and enquiries concerning the Study should be sent to: Derek Holton, Chair, IPC, ICMI Study, Department of Mathematics and Statistics, University of Otago, PO Box 56, Dunedin, New Zealand; e-mail: [dholtan@maths.otago.ac.nz](mailto:dholtan@maths.otago.ac.nz); fax: (+64-3) 479 8427.

## **SYMMETRY AND PERTURBATION THEORY**

A workshop on "Symmetry and Perturbation Theory" will take place in Rome (Italy) on 16-22 December 1998, following a workshop with the same title held in Torino in December 1996. Whoever is interested in participation should contact the main organizer, G. Gaeta by e-mail (please use "Subject: SPT98"), using the e-mail address: [gaeta@roma1.infn.it](mailto:gaeta@roma1.infn.it). The home page of the conference, showing also preregistered participants, is temporarily located at <http://www.lboro.ac.uk/departments/ma/staff/gg/SPT98.html> and will later on be accessible through the servers <http://w3.roma1.infn.it/> and <http://www.mat.unimi.it>.

## **ICM'98**

The Second Announcement of the International Congress of Mathematicians, to be held in Berlin, 18-27 August 1998, has appeared. It describes the Congress and gives related information. It explains how to register and how to submit a short communication or a poster presentation. It also contains the necessary forms for securing accommodation during the Congress. Details can be found at the ICM'98 WWW site (<http://elib.zib.de/ICM98>). This WWW site is regularly updated and will provide the final scientific programme when it is available.



**50th BRITISH MATHEMATICAL  
COLLOQUIUM  
University of Manchester  
6-9 April 1998**

Members will have received application forms for this meeting along with the November issue of the Newsletter, which also contains some details of the main programme. The speakers in the Special Session on Mathematical Logic (Tuesday 7 April) are A J Macintyre (Oxford), A Kechris (Caltech), M Boffa (Mons) and D Macpherson (Leeds). The speakers in the Special Session on Dynamical Systems (Wednesday 8 April) are J-C Yoccoz (Paris), S J van Strien (Warwick) and Lai Sang Young (UCLA).

The AGM will be held at 7.30 pm on Tuesday 7 April, and will be followed by a discussion forum on 'Electronic Publishing' led by C P Rourke (Warwick). There will also be a demonstration by Springer

of their electronic publishing system. On the evening of Wednesday 8 April, there will be a special dinner at Hulme Hall to celebrate the 50th BMC, following which Professor H K Moffatt will give a short presentation on the work of the Newton Institute. Alongside the book exhibition there will be information desks staffed by EPSRC and by the Computers in Teaching Initiative (CTI Mathematics) University of Birmingham.

The BMC is supported financially by the London and Edinburgh Mathematical Societies. Research students receive a subsidy as described on the application form. The BMC's www page (<http://www.ma.man.ac.uk/~grant/bmc.html>) can be accessed via the Diary page on the LMS website. Bookings for accommodation at Hulme Hall should be received by **Friday 20 March**.

Grant Walker  
Secretary

**INTERNATIONAL CENTRE FOR MATHEMATICAL SCIENCES  
EDINBURGH  
COMPUTATION AND GEOMETRIC ASPECTS  
OF MODERN ALGEBRA**

**23rd - 31st July 1998  
Heriot-Watt University, Edinburgh**

An ICMS Workshop with concentration periods on:

**WORD PROBLEMS IN ALGEBRA** (23rd-25th July) Invited speakers include: J H Davenport (Bath), G Havas (Queensland), D F Holt (Warwick), K Madlener (Kaiserslautern), U H M Martin (St Andrews), C F Miller (Melbourne), W Nickel (St Andrews), S E Rees (Newcastle).

**GEOMETRIC GROUP THEORY** (27th-31st July) Invited speakers include: N Brady (Cornell), T Brady (Dublin City Univ.), D B A Epstein (Warwick), R I Grigorchuk (Steklov Institute), W D Neumann (Melbourne), A Yu Ol'shanskii (Moscow State Univ.), M Sageev (Rutgers), M V Sapir (Vanderbilt), Z Sela (Hebrew University), V Suchshanskii (Kiev).

The workshop is partially supported by the UK Engineering and Physical Sciences Research Council. Support may be available for participants from UK institutions. For further details and a registration form, contact: Nick Gilbert, CGAMA 98, Department of Mathematics, Heriot-Watt University, Riccarton, Edinburgh EH14 4AS ([n.d.gilbert@hw.ac.uk](mailto:n.d.gilbert@hw.ac.uk), 0131-451 3718) or visit the website (<http://www.ma.hw.ac.uk/~nick/cgama.html>).





Isaac Newton Institute for Mathematical Sciences  
Director: Professor HK Moffatt, FRS  
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## EC Summer School ASTROPHYSICAL DISCS 21 - 27 June 1998

This summer school, directed towards advanced graduate students, postdoctoral fellows and researchers is intended to cover the physical processes that occur in Astrophysical Discs. Hydromagnetic processes, turbulence, and external forcing will be considered. Discs in the context of active galactic nuclei, galaxy discs, protostars and close binary systems will be discussed.

**Organising Committee** J Goodman (Princeton), J Papaloizou (QMW), J Pringle (Cambridge), J Sellwood (Rutgers).

**Provisional Lecturers** A Fridman, C Gammie, G Laughlin, D N C Lin, R Narayan, B Mathieu, E Ostriker, J Papaloizou, J Pringle, R Pudritz, J Sellwood, A Toomre, I Yi.

**Grants** The conference is supported by a grant from the European Community which will provide funding towards the registration, travel and subsistence costs of selected young (under 35 years) participants. Applications from women and anyone living in Greece, Ireland and Portugal and other less favoured regions of the European Community are particularly encouraged. Early application for grants is advisable.

Other limited funds exist for participants from outside the EC. Self-supporting participants of any age and nationality are welcome to apply.

**Applications** The workshop will take place at the Newton Institute and accommodation for participants will be provided at Wolfson Court, adjacent to the Institute. The conference package costs £350 which includes registration fees, accommodation, breakfast and evening meals plus lunch and refreshments during the days that the workshop takes place.

**Further information and application forms** are available from the WWW at <http://www.newton.cam.ac.uk/programs/dad.html> where information about the main programme and general information about the Newton Institute can also be found. Completed application forms should be sent to Heather Hughes at the above address, or via e-mail ([h.hughes@newton.cam.ac.uk](mailto:h.hughes@newton.cam.ac.uk)).

Closing date for the receipt of applications is **20 April 1998**.

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*Cambridge Tracts in Mathematics* 127

**Numerical Methods in Finance****Edited by L. C. G. Rogers and D. Talay**

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*Publications of the Newton Institute* 13

**Clifford Algebras****P. Lounesto**

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**Stable Groups****F. Wagner**

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*London Mathematical Society Student Texts* 11

**Combinatorics**

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## SECANTS

The eighth SECANTS (South of England Computational and Algorithmic Number Theory Seminars) meeting will take place in Oxford on Saturday 14 March 1998. The invited speaker will be Henri Cohen (Bordeaux), and the other speakers will be Kevin Buzzard (Cambridge), Richard Pinch (Cambridge) and Harvey Rose (Bristol). For details of the programme, see <http://www.maths.ex.ac.uk/~cremona/secants/secants8.html>. For general information about SECANTS, and to be put on the e-mail mailing list, see <http://www.maths.ex.ac.uk/~cremona/secants/index.html>.

## WMY 2000

The World Mathematical Year 2000 Newsletter 5 has appeared. Issues 1, 2, 3, 4 and 5 are available on internet (<http://www.math.jussieu.fr>).

## 1998 ADAMS LECTURES

The Adams lectures are held annually at the University of Manchester in memory of Frank Adams. The 1998 Adams Lecturer is Professor Franklin P. Peterson of M.I.T., who will be visiting Manchester from 1 March to 30 April. The lectures will be held in the Mathematics Department, University of Manchester, Room 2.14, at 4.00 pm on Wednesday 18th, Thursday 19th and Friday 20th March 1998. The theme of the lectures is the Steenrod algebra and its action on rings of polynomials, in particular the Dickson algebra. The first lecture will give some background and history of the Steenrod algebra for a general audience. The local organisers are Reg Wood ([reg@ma.man.ac.uk](mailto:reg@ma.man.ac.uk)) and Grant Walker ([grant@ma.man.ac.uk](mailto:grant@ma.man.ac.uk)), and the lectures are sponsored by KPMG.



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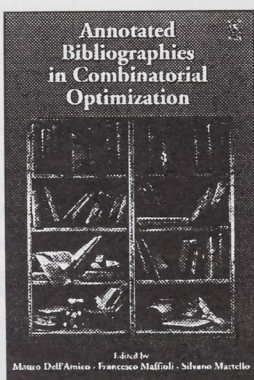
## Annotated Bibliographies in Combinatorial Optimization

**MAURO DELL'AMICO**, Università di Modena, Italy,  
**FRANCESCO MAFFIOLI**, Politecnico di Milano, Italy  
and **SILVANO MARTELLO**, Università degli Studi di  
Bologna, Italy

This book presents annotated bibliographies on important topics within the field of combinatorial optimization. However, the book offers much more than a pure bibliography as each chapter provides a concise, comprehensive and fully up-to-date survey of that area.

**CONTENTS:** Preface - Selected Books in and Around Combinatorial Optimization, *F Maffioli, S Martello* - Hardness of Approximation, *V Kann, A Paconesi* - Polyhedral Combinatorics, *K Aardal, R Weismantel* - Branch and Cut Algorithms, *A Caprara, M Fischetti* - Matroids and Sub-Modular Functions, *A Frank* - Perfect, Ideal and Balanced Matrices, *M Conforti, G Cornuéjols, A Kapoor, K Vuskovic* - Advances in Linear Optimization, *C Roos, T Terlaky* - Decomposition and Column Generation, *F Soumis* - Stochastic Integer Programming - *L Stougie, M H Van der Vlerk* - Randomized Algorithms, *M Geomans, D Karger, J Kleinberg* - Local Search, *E Aarts, M Verhoeven* - Sequencing and Scheduling, *J A Hoogeveen, J K Lenstra, S L Van de Velde* - Travelling Salesman Problem, *M Jünger, G Reinelt, G Rinaldi* - Vehicle Routing, *G Laporte* - Max-Cut, *M Laurent* - Location Problems, *M Labbé, F Loveaux* - Flows and Paths, *R K Ahuja* - Network Design, *A Balakrishnan, T L Magnanti, P Mirchandani* - Network Connectivity, *T L Magnanti, S Raghavan* - Linear Assignment, *M Dell'Amico, S Martello* - Quadratic and Three Dimensional Assignments, *R E Burkard, E Çela* - Cutting and Packing, *H Dyckhoff, G Scheithauer, J Terno* - Set Covering, *S Ceria, P Nobili, A Sassano* - Combinatorial Topics in VLSI Design, *R H Möhring, D Wagner* - Computational Molecular Biology, *M Vingron, H P Lenhof, P Mutzel* - Author Index

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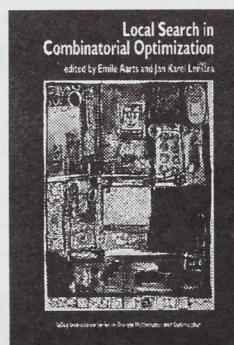
## Local Search in Combinatorial Optimization

Edited by **EMILE AARTS**, Philips Research  
Laboratories, Eindhoven, The Netherlands  
**JAN KAREL LENSTRA**, Eindhoven University of  
Technology,  
Eindhoven and **CWI  
Amsterdam, The  
Netherlands**

The contributions to this book cover local search and its variants from both a theoretical and practical point of view, each with a chapter written by leading authorities on that particular aspect.

**CONTENTS:** Preface; Introduction *Emile H. L. Aarts, Jan Karel Lenstra*; Computational Complexity *Mihalis Yannakakis*; Local Improvement on Discrete Structures *Craig A. Tovey*; Simulated Annealing *Emile H. L. Aarts, Jan H. M. Korst, Peter J. M. van Laarhoven*; Tabu Search *Alain Hertz, Eric Taillard, Dominique de Werra*; Genetic Algorithms *Heinz Mühlebein*; Artificial Neural Networks *Carsten Peterson, Bo Söderberg*; The Traveling Salesman Problem: a case study *David S. Johnson, Lyle A. McGeoch*; Vehicle Routing: Modern Heuristics *Michael Gendreau, Gilbert Laporte, Jean-Yves Potvin*; Vehicle Routing: Handling Edge Exchanges *Gerard A. P. Kindervarter, Martin W. P. Savelsbergh*; Machine Scheduling *Edward J. Anderson, Celia A. Galss, Chris N. Potts*; VLSI Layout Synthesis *Emile H. L. Aarts, Peter J. M. van Laarhoven, C. L. Liu, P. Pan*; Code Design *Iiro S. Honkala, Patrik R. J. Östergård*; Bibliography; Author Index; Subject Index

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## BOOK REVIEW

**Modern Mathematics in the Light of the Fields Medals** by Michael Monastyrsky. A.K. Peters, 1996, 167 pp, US\$35.00.

**Fields Medallists' Lectures** edited by Sir Michael Atiyah and Daniel Iagolnitzer. World Scientific, 1997, 650 pp, £60 hb, £33 pb.

"Have you heard that XXXX is going to get a Fields Medal?" "Is he really under 40?" It has come to that stage in the familiar four-year cycle, with departments and nations eagerly hoping to enhance their mathematical prestige by claiming allegiance to one of the next winners. With the Congress of Berlin fast approaching this summer, what better time than to publish a book about the Fields Medallists? Indeed, what better time than to publish two?

What we have, however, are two very different offerings, which have different aims. The *Fields Medallists' Lectures* provides a compilation of reprinted material giving a profile of the work of 22 of the 38 recipients of the award since its beginning in 1936. In many cases this consists of first the appreciation of the medallist's work given at the appropriate International Congress, and then the plenary talk offered by the mathematician himself. But that 40 years old cut-off, which one imagines occasionally presents the committee with some problems, is addressed too. In principle the Fields Medal is intended to encourage young mathematicians to continue in their good work, and not, as the Nobel Prize often does, to reward a scientist for achievements in the past. So in this volume the citation and lecture is followed by a mathematical paper which often shows the subsequent development of the individual concerned. Thus we see Novikov, rewarded in 1970 for his work in topology, represented by a paper on integrable systems, or Mumford making his journey from algebraic geometry in 1974 to pattern recognition today. What results is a 632 page volume which one

eagerly dips into knowing the individual and not the work, or vice-versa.

Monastyrsky's book is quite different. It is short enough and readable enough to sit down and consume in one go. Here we run through the achievements of all prizewinners through the context of their subject at the time. More is said of the status and history of their area of mathematics at the time of their seminal contributions, and the author freely discusses his own interpretation of where the subject has gone since. The treatment is thankfully not carried out chronologically, but organized into major areas together with a mixed bag of individualists at the end.

What results, as Freeman Dyson writes in his foreword, is a "road map to the territory of mathematics with the Fields Medals as a convenient set of nodal points". The book nevertheless also contains a potted history of the origin of the medal (how many of us know that the designer of the medal, Tate Mackenzie, also sculpted the war memorial soldier in Cambridge whose tin hat conveniently points the way from the station to Mill Lane?), of the work of John Fields in overcoming political prejudice in establishing the 1924 Congress in Toronto to include representatives of Germany and their First World War allies, and of the reverse prejudice some 50 years later in trying to get proper Soviet representation. In fact the birth of this book was a short history of the Fields Medals, banned at the time, written in Russia when Margulis was prevented from attending the 1978 Congress to collect his prize. The subsequent rewriting, translating and updating means that there are a few minor inconsistencies such as the author making a prophecy about the Kyoto conference on page 5 and describing its fulfilment on page 123. Nevertheless, this book provides an entertaining and readable introduction to a large cross-section of modern mathematics.

It is, however, to the *Lectures* that one must return to get a personal view of the Fields Medal and its effect on the winner.



Instead of a mathematical paper, René Thom has contributed an autobiography. Here he asserts (after modestly claiming that work of others which followed his own award-winning contributions was "greater in depth and sagacity") that "the Fields Medal meant for me a certain fragility, which the future was to make even more visible". That "fragility" translated itself into a complete change of direction, as he abandoned cobordism theory to throw himself into what is now called catastrophe theory. No doubt the award of the medal is a key event in the mathematical lives of all recipients, but for few can it have been so pivotal as this.

N.J. Hitchin  
Oxford University

## CONFERENCES AT BIELEFELD

An International Conference devoted to **Representation Theory of Algebras** will be held from 31 August - 5 September, 1998 at the University of Bielefeld. The scientific organization lies in the hands of: Dieter Happel (Chemnitz), Helmut Lenzing (Paderborn), Claus Michael Ringel (Bielefeld) and Klaus W. Roggenkamp (Stuttgart).

There will be 18 one-hour lectures on important recent developments in the subject and on decisive relations to other parts of mathematics. The following mathematicians have accepted an invitation for such a lecture: Hans Joachim Baues (Bonn), Raymundo Bautista (UNAM, Mexico), Jon Carlson (Athens, USA), William Crawley-Boevey (Leeds), Gordon James (London), Mikhail Kapranov (Boston), Olivier Mathieu (Strasbourg), Sergei Ovsienko (Kiev), Idun Reiten (Trondheim), Andrzej Skowronski (Torun), Katsuhiko Uno (Osaka), Michel Van den Bergh (Hasselt), Jie Xiao (Beijing). The remaining one-hour lectures and additional twenty-minute lectures (in parallel sessions) will be arranged on the basis of abstracts provided by participants. On Tuesday evening (September 1) there will be a

presentation of computer algebra packages which handle problems in representation theory, organized by Peter Dräxler (Bielefeld). The final programme will be available 31 July 1998 on the internet.

The deadline for the submission of an abstract is 30 June 1998. Such an abstract should be no longer than one page and should clearly state the result to be presented. The abstracts obtained in time will be distributed to all participants. Further information concerning the meeting (including a registration form) is available on the internet: <http://www.mathematik.uni-bielefeld.de/~sek/98rep.html> or you may contact: Ms H. Scharsche, Fakultät für Mathematik, Universität, PO Box 100 131, D-33501 Bielefeld, Germany; fax: (+49) 521 106-4743; e-mail: [scharsch@mathematik.uni-bielefeld.de](mailto:scharsch@mathematik.uni-bielefeld.de).

A Euroconference **Infinite Length Modules** will be held, 7 - 11 September 1998, at the University of Bielefeld (starting on September 7 at 9:00 am and ending on September 11 at 17:00 pm). The scientific organization lies in the hands of K.A. Brown (Glasgow), P.M. Cohn (London), I. Reiten (Trondheim), C.M. Ringel (Bielefeld).

The aim of the conference is to provide a survey of methods and results concerning modules of infinite length (in comparison to the well-known properties of finite length modules). The Euroconference is financially supported by the TMR-program of the European Union. Special funds are available for allowing young researchers from member states of the European Union to participate.

Further information concerning the Euroconference (including a registration form) is available in the internet under: <http://www.mathematik.uni-bielefeld.de/~sek/E-C-BIE.html> or you may contact: Ms H. Scharsche, Fakultät für Mathematik, Universität, PO Box 100 131, D-33501 Bielefeld, Germany; fax: (+49) 521 106-4743; e-mail: [scharsch@mathematik.uni-bielefeld.de](mailto:scharsch@mathematik.uni-bielefeld.de).



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## EUROPEAN LIBRARIES AND ELECTRONIC RESOURCES IN MATHEMATICAL SCIENCES

EULER (European Libraries and Electronic Resources in Mathematical Sciences) is a project to be co-funded by the European Commission in the Telematics for Libraries sector. The project will start in 1998 and have a duration of 30 months.

The aim of the project is to provide strictly user-oriented, integrated network based access to mathematical publications. One of its uses will be to improve the user interface of the European Mathematical Information Service (EMIS). The EULER service intends to offer a "one-stop shopping site" for users interested in Mathematics. Therefore, an integration of all types of relevant resources is necessary:

- Bibliographic databases
- Library online public access catalogues
- Electronic journals from academic publishers
- Online archives of preprints and grey literature
- Indexes of mathematical Internet resources

and will be made interoperable by using common Dublin Core based Metadata descriptions. A common user interface - the EULER Engine - will assist the user to search for relevant topics in different sources in a single enquiry.

Today, the scientist looking for mathematical information on the Web has to search a huge number of different resources in the world of networked library and other scientific information. For example he/she has to consult.

- the bibliographic databases, e.g. MATH (Zentralblatt) and MATHSci containing the relevant publications on the field of mathematics from 1931 until present (for-pay services)
- the OPACs of the important mathematical libraries (free)
- electronic journals online (both subscription and free)
- the preprint servers and technical reports offering grey literature (free)
- software libraries (free)
- guides to the net resources (free)

The number of servers with mathe-

matics-related topics exceeds 3,000 destinations world-wide. Nearly every library has built up an OPAC, most departments have their own Internet servers.

There are many difficulties in searching the Internet:

- there are no actual and general guides about the information resources. The common search machines like Alta Vista, Hotbot and so on provide no high quality service for searching (it is only possible to search for specific details of the information in reduced mode)
- the Web is very dynamic, there are many change of the services available
- the different decentralised information resources are only weakly connected (little integration)
- the quality of the information services varies and there is no common standard.

One crucial difficulty for the scientist is that up to now, if he/she has found several relevant articles and books he/she has to leave the Internet and has to consult the catalogues of different libraries, perhaps at his/her university or at some specialised libraries. To get the information about literature is - compared to former times - no longer a big problem. But to get the articles or the books to the desk of the scientist has been up to now a difficult, but for the user an important and common, problem. The drawbacks of the present situation highlight the demands and user requirements for the development of new services. We need a new high quality information system which integrates the relevant services in the field.

The EULER system will integrate some of the major services in Mathematics. Moreover the system will integrate three different important steps of accessing relevant literature and information:

- searching
- localising of the documents (objects) in the library or on the network
- document delivery by library partners.

The EULER system will be designed as an open, accessible and extensible information system.

Library users and librarians from mathematics in research, education, and in-



dustry will actively participate. EULER is an initiative of the European Mathematical Society and especially focuses on real user needs.

Standard, widely used and non-proprietary technologies such as HTTP, Z39.50, and Dublin Core will be used. Common resource descriptions of document-like objects will enable common access to heterogeneous resources.

EULER will develop the prototype of new electronic information services. Most relevant information of one subject area is integrated (one-stop-shopping). EULER results will be portable to other subject domains.

Users will be enabled to make effective use of the mathematical library-related information resources offered through a single user interface. Time-consuming tasks associated with the use of non-integrated services will be eliminated. The user will be enabled to search for and localise relevant documents. In many cases he/she will be able to retrieve the full text electronically.

Since EULER will combine descriptions of resources (the bibliographical databases) with the full text of documents, free resources with commercial ones and databases with very different structures, retrieval systems and user interfaces, this integration must be built upon common resource descriptions. This glue or intermediate level is accomplished by using descriptions of all resources following the Dublin Core (DC) metadata standard, recently developed and published as an Internet draft.

Technically, the integration of the different resources will be accomplished by producing DC metadata for all resources (by means of conversion, automatic generation or metadata creator software), and collecting it into front-end databases for each individual EULER service. Retrieval and search software, the EULER Engine, will use these metadata databases as sources for a distributed search service. The integration approach will be based on the Z39.50 standard or on HTML-form-based data interchange.

At distributed servers, multilingual EULER service interfaces will be provided as entry points to the EULER Engine,

offering browsing, searching, some document delivery and user support (help texts, tutorial etc.). The interface will be based on common user friendly and widely used Web browsers (public domain or commercial).

Main project partners are

- FIZ Karlsruhe (Dept. Math. & Comput. Sci., Berlin) (Coordinator)
- The European Mathematical Society
- Cellule de Coordination Documentaire Nationale pour les Mathématiques
- NetLab, Lund University Library
- SUB Göttingen
- Centrum voor Wiskunde en Informatica
- Universit' degli Studi di Firenze

The project is an initiative of the European Mathematical Society. The role of the EMS in the project will be to represent the community of users interested in mathematics from the whole of Europe. The EMS will inaugurate its Electronic Library of Mathematics, distributed through EMS's system of Internet servers, EMIS, <http://www.emis.de/>. This Electronic Library is today the most comprehensive archive of freely available mathematical electronic journals and conference proceedings. Some improvements of this service can be expected during the project.

Close interaction between the information specialists and the mathematical community is very important. Experiences in other projects - as for example the project 'Specialised information' of the Deutsche Mathematiker-Vereinigung - have clearly shown this need. This interaction has led to many improvements of special information systems, for example the database MATH. Accordingly, a broad discussion with the mathematical community is planned for each phase of the project. The EULER services will be installed at all participating libraries and at the central site of the EMIS system of the European Mathematical Society. More, constantly updated, information about the EULER project is available from the project's homepage at <http://www.emis.de/projects/EULER/>.

Michael Jost



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Real and complex analysis	Professor A G O'Farrell, National University of Ireland, Maynooth, Co. Kildare, Ireland.
Real harmonic analysis	Professor A P Carbery, Dept of Maths, University of Edinburgh, Mayfield Road, Edinburgh EH9 3JZ.
Representation theory and algebra	Dr W Crawley-Boevey, School of Mathematics, University of Leeds, Leeds LS2 9JT.
Singularity theory, real algebraic geometry	Dr D M Q Mond, Mathematics Institute, Warwick University, Coventry CV4 7AL.
Topology	Professor J P C Greenlees, School of Maths & Statistics, Hicks Building, University of Sheffield, Sheffield S3 7RH.

### GROUPS IN GALWAY '98

The Mathematics Department of the National University of Ireland, Galway will hold its annual Groups in Galway conference on 21-23 May 1998. This will be the twenty-first such conference. At present, the list of speakers includes: Roger Bryant (Manchester), Martin Dunwoody (Southampton), Dane Flannery (Galway), Willem de Graaf (St. Andrews), Derek Holt (Warwick), Jim Howie (Heriot-Watt), Luise-Charlotte Kappe (SUNY), Goetz Pfeiffer (Galway), Sarah Rees (Newcastle), Howard Smith (Bucknell), Patrick Sole (Nice), Ralph Stohr (Manchester). For further details please contact [graham.ellis@ucg.ie](mailto:graham.ellis@ucg.ie). The conference is receiving financial support from: Disk Doctors Ltd (Galway) and NUIG.

### CTI HANDBOOK

A new CTI (Computers in Teaching Initiative) Handbook has been published. It includes details of all the CTI Subject Centres, the CTI Support Service, and related initiatives in higher education. It is available free on request from CTISS, University of Oxford, 13 Banbury Road, Oxford OX2 6NN (e-mail: [ctiss@oucs.ox.ac.uk](mailto:ctiss@oucs.ox.ac.uk); fax: 01865 273275).

### PHYSICAL INTERPRETATIONS OF RELATIVITY THEORY

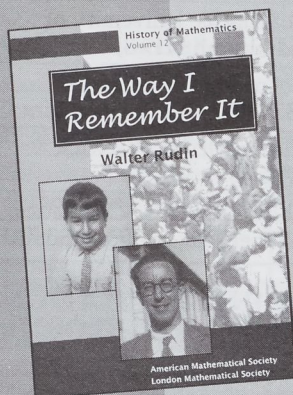
The sixth meeting to review "Physical Interpretations of Relativity Theory" is scheduled to take place at Imperial College London between Friday 11 and Monday 14 September 1998. Brochures stating objectives of the meeting and giving information about submission of abstracts and papers, registration fees, accommodation etc., and Registration Forms are obtainable from Dr M.C. Duffy, School of Engineering and Advanced Technology, University of Sunderland, Chester Road, Sunderland SR1 3SD (tel: 0191 515 2856; fax: 0191 515 2703; e-mail: [michael.duffy@sunderland.ac.uk](mailto:michael.duffy@sunderland.ac.uk)).

### KING FAISAL PRIZE

Professor Andrew Wiles FRS, Eugene Higgins Professor of Mathematics at Princeton University, has been awarded the 1998 King Faisal International Prize for Mathematics for his work in proving Fermat's Last Theorem. Professor Wiles was nominated for this prize by the London Mathematical Society. Previous winners are Professor Sir Michael Atiyah FRS (1987) and Professor Dennis Sullivan (1994).



# The Way I Remember It



**Walter Rudin,**  
University of Wisconsin, Madison

*It is a real pleasure to read this book and to admire the charming personal style we have come to know from Rudin's textbooks, monographs and articles. The book is strongly recommended not only to analysts, but also to all mathematicians as well as historians.*

—European Mathematical Society Newsletter

Of noteworthy significance.

—Zentralblatt für Mathematik

*With this memoir Rudin gives the entire mathematical community a chance to make his acquaintance both mathematically and personally, and a very worthwhile acquaintance it is. The biographical section ... is fascinating ... It's what the literary critics call "a good read" ... this book is a delight to read and will also help to inspire and guide young analysts in the path of wisdom. You will not want to miss a single page of it ... recommend it to everyone.*

—Mathematical Reviews

Walter Rudin's memoirs should prove to be a delightful read specifically to mathematicians, but also to historians who are interested in learning about his colorful history and ancestry. Characterized by his personal style of elegance, clarity, and brevity, Rudin presents in the first part of the book his early memories about his family history, his boyhood in Vienna throughout the 1920s and 1930s, and his experiences during World War II.

Part II offers samples of his work, in which he relates where problems came from, what their solutions led to, and who else was involved. As those who are familiar with Rudin's writing will recognize, he brings to this book the same care, depth, and originality that is the hallmark of his work.

Co-published with the London Mathematical Society. Members of the LMS may order directly from the AMS at the AMS member price. The LMS is registered with the Charity Commissioners.

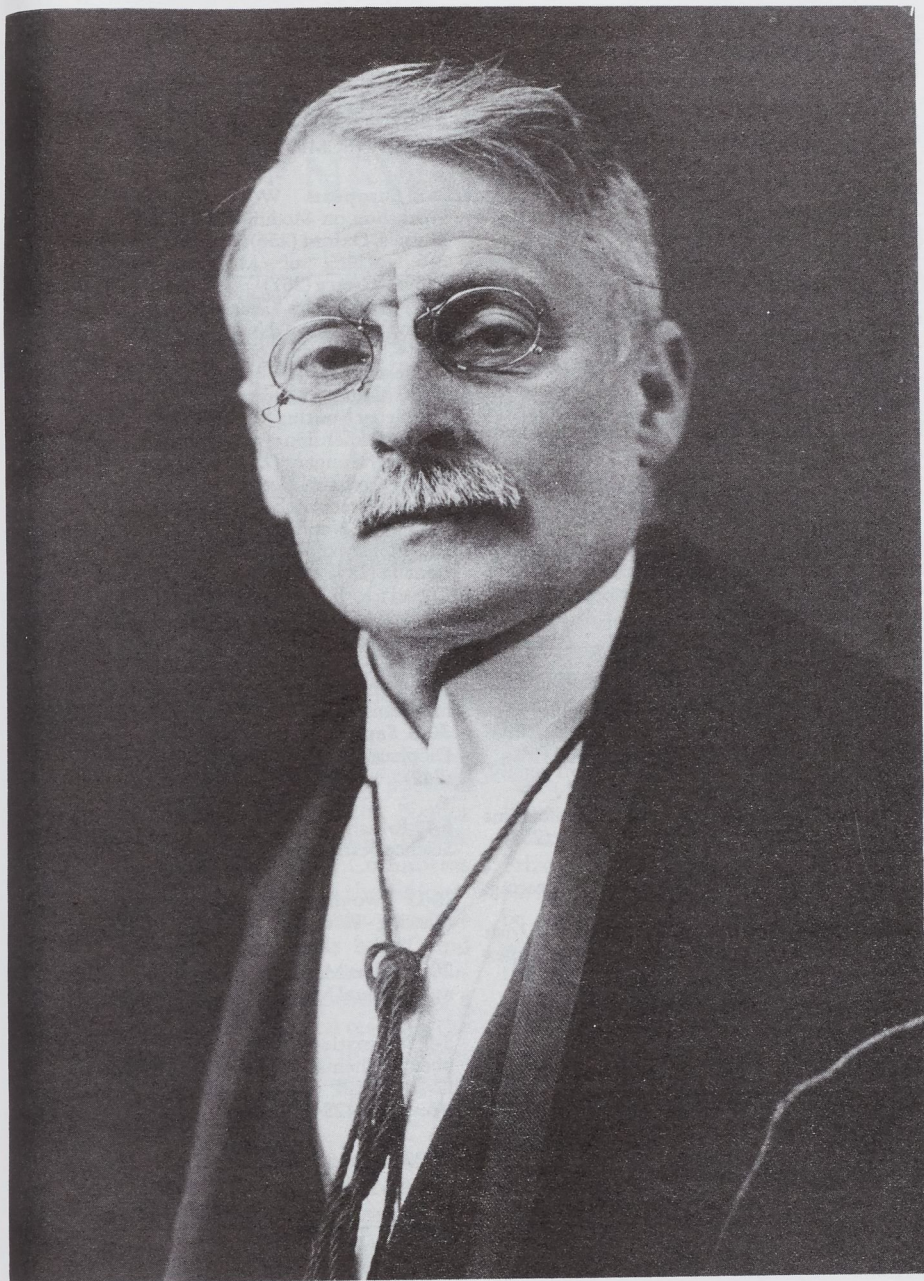
**History of Mathematics**, Volume 12; 1997; 191 pages; Softcover; ISBN 0-8218-0633-5; List \$29; All AMS members \$23; Order code HMATH/12LMS



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C-J. DE LA VALLÉE-POUSSIN  
Honorary Member 1952



## 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.

### MARCH 1998

- 2 North British Functional Analysis Seminar, University of Newcastle upon Tyne (256)
- 13 Edinburgh Mathematical Society Meeting, Dundee University (252)
- 22-28 Fuchsian Groups EPSRC-LMS Short Course, Lancaster University (256)
- 23-3 Apr Symplectic Topology Workshop, Warwick University (255)
- 25-26 Jordan Structures in Analysis and Geometry Conference, Goldsmiths College, London (256)
- 30-4 Apr Random Sets and their Applications Workshop, ICMS, Edinburgh (257)
- 30-4 Apr Vector Bundles and Principally Polarised Abelian Varieties Workshop, University of Durham (257)
- 31-3 Apr Computational Fluid Dynamics Conference, Oxford University (252)

### APRIL 1998

- 6-9 British Mathematical Colloquium, Manchester University (257)
- 6-9 British Applied Mathematics Colloquium, Brunel University (254)(257)
- 14-16 British Topology Meeting, Aberdeen University (255)
- 16 British Women in Mathematics Day, Coventry University (256)
- 16-17 JHC60, Newton Institute, Cambridge (257)
- 20-24 LMS Invited Lectures, Exeter University, Professor D. Zagier
- 20-24 Probability: Theory and Applications Workshop, Nottingham Trent University (252)

### MAY 1998

- 8 Edinburgh Mathematical Society Meeting, Aberdeen University (252)
- 22-23 London Mathematical Society and Irish Mathematical Society Joint Meeting on Complex Analysis and Dynamical Systems, London

### JUNE 1998

- 4-10 Advances in Homotopy Theory Euroconference (BCAT), Barcelona, Spain (257)
- 5 Edinburgh Mathematical Society Meeting, St Andrews University (252)
- 7-19 Arithmetic and Geometry of Algebraic Cycles NATO ASI, Alberta, Canada (255)
- 22-26 Groups of Finite Morley Rank Conference, Greece (255)
- 22-26 Positivity in Applications Meeting,

Ankara, Turkey (256)

22-27 European Consortium for Mathematics in Industry (ECMI 98), Göteborg, Sweden (252)

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

### AUGUST 1998

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

### SEPTEMBER 1998

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

### OCTOBER 1998

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

### NOVEMBER 1998

- 20 London Mathematical Society Meeting - Annual General Meeting

### JULY 1999

- 5-9 International Congress of Industrial and Applied Mathematics (ICIAM 99), Edinburgh (252)
- 12-16 British Combinatorial Conference, Kent University (254)

### JULY 2000

- 17-22 International Congress of Mathematical Physics, Imperial College, London (257)

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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