THE LONDON MATHEMATICAL SOCIETY NEWSLETTER

No. 308

October 2002

GENERAL ASSEMBLY OF THE INTERNATIONAL MATHEMATICAL UNION

The General Assembly of the IMU took place in Shanghai on 17-18 August 2002, just before the International Congress of Mathematicians. The United Kingdom is entitled to five delegates and five votes. The delegation was led by Terry Lyons, Vice-President of the London Mathematical Society, and the other delegates were John Ball, Ben Garling, Chris Lance and Martin Taylor.

During the meeting, John Ball was elected as the next President of the IMU, succeeding Jacob Palis.

One of the major outcomes was the endorsement of the initiatives of the Union's Committee on Electronic Information and Communication, the most far-reaching of which is a plan to digitise all mathematics and to make journal articles in electronic form freely accessible five years after publication. In particular this will improve access by mathematicians of the developing world. Although this was generally welcomed, there was some concern about the five years time scale; a longer time scale might be appropriate in the first instance.

The Assembly also opposed holding individual mathematicians responsible for the actions of their governments by restricting contracts and interactions. This opposition was unanimously supported by all mathematicians, from across the whole spectrum of nationalities.

Ben Garling

LMS 2002 ELECTIONS AND OFFICERS

The ballot papers for the November elections to Council and Nominating Committee are being circulated with this copy of the *Newsletter*.

Trevor Stuart's term of office as President comes to an end and the current President-Designate Peter Goddard is nominated as the next President. Amanda Chetwynd is nominated as a new Vice-President.

As previously indicated there have been several changes to the Officers. Nick Woodhouse is nominated as Treasurer, Norman Biggs is nominated as General Secretary, and Brian Stewart is nominated as Education Secretary. The last is a new post.

As a result of these changes the Society's Librarian is no longer an Officer. This post will, however, continue to be held by a member of Council and Robert Curtis took over on 1 August 2002.

> Norman Biggs General Secretary

ANNUAL DINNER

The Annual Dinner will be held after the Annual General Meeting on Friday 22 November at 7.30 pm at the Court Restaurant, The British Museum, Great Russell Street, London WC1. The cost is £30.00 per person and members may book places for guests. The booking form, enclosed with this *Newsletter*, should be returned together with payment to the London Mathematical Society office by **Monday 18 November**.

ANNUAL SUBSCRIPTION

The LMS annual subscription, including publications, for the session November 2002 - October 2003 is due on 1 November 2002. Together with this *Newsletter* is a renewal form to be completed and returned with your remittance in the enclosed envelope.

No action is required if you are already paying by direct debit, and do not wish to change your choice of publications. Fully complete and return the form if you are paying by direct debit but wish to change your choice of publications or add/delete a subscription to the European Mathematical Society. Bank accounts of members paying by direct debit will be debited with the appropriate amount on 15 January 2003. Other members should either enclose a cheque (£ sterling or US\$) with their form or, if they have a UK bank account and wish to take advantage of this convenient form of payment, request a direct debit mandate. Although the facility to pay by credit card is open to all members of the Society, it is our preference that members continue to pay by direct debit.

SUBSCRIPTIONS AND PERIODICALS

The annual subscription to the London Mathematical Society for the 2002-03 session shall be: Ordinary Members £27.00; Reciprocity Members £13.75; Associate Members £6.75. The prices of the Society's periodicals to Ordinary, Reciprocity and Associate Members for the 2002-03 session shall be: Proceedings £54.00; Journal £54.00; Bulletin £27.00; Journal of Computation and Mathematics is free and Nonlinearity £42.00.

PUBLICATIONS PRICING POLICY

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

LONDON MATHEMATICAL SOCIETY

ANNUAL GENERAL MEETING

Friday 22 November 2002

3.15 - 3.30 Annual General Meeting

3.30 - 4.30 Professor J.D. Gibbon (Imperial College) Singularity Formation in the 3D Euler Equations

4.30 - 5.00 Tea

5.00 - 6.00 Professor J.T. Stuart, FRS (Imperial College) Presidential Address Hydrodynamic Stability and Singularities

> The meeting will be held in the Chemistry Auditorium, Christopher Ingold Building, University College, 20 Gordon Street, London WC1.

> > All interested are very welcome

Please note the early start

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

The meeting will be followed by the Annual Dinner. For further details see the announcement in this *Newsletter*. All enquiries may be addressed to Susan Oakes (tel: 020 7637 3686, e-mail: oakes@lms.ac.uk).



LMS Stand



David Tranah, Martin Taylor, Bela Bollobas



Shiing-Shen Chern and John Ball



Terry Lyons, LMS Vice-President



Jhi-Ming Ma

LMS AT ICM 2002 -BEIJING

Society's meeting The at Beijing was followed by a reception. The members and guests present included Shiing-Shen Chern (honorary member and honorary President of the International Congress), David Mumford (honorary member), Jacob Palis (retiring President of the IMU). John Ball (former LMS President and incoming President of IMU), Jhi-Ming Ma (organiser of the Congress), Martin Taylor (former LMS President), Ian Sloan (organiser of ICIAM 2003), Jose Luis Fernandez, Carlos Andradas and Carlos Cascuberta (organising the next ICM in Madrid, in 2006), and representatives of most Societies with which we have reciprocal arrangements. The reception was greatly enjoyed: it measured up to the excellent standards set by our Chinese hosts at the opening banquet in the Great Hall of the People and at the memorable Congress party. The Society the was represented at Congress by having an exhibition stand, where participants learnt about the Society's activities and publications.



LMS Reception



Ian Sloan, Jim Kister, Vladimir Maz'ja, Jane Kister



Jacob Palis



Jose Luis Fernandez and Carlos Andradas

SHEILA EDMONDS

Dr Sheila M. Edmonds, who was elected a member of the London Mathematical Society on 21 May 1942, died on 2 September 2002, aged 86.

WILFRED LENG

Mr Wilfred S. Leng, who was elected a member of the London Mathematical Society on 15 November 1991, died on 30 August 2002, aged 49.

MARK PATON

Dr Mark Paton, who was elected a member of the London Mathematical Society on 19 March 1993, died on 27 October 2001.

ROBERT ODONI

Professor Robert W.K. Odoni, who was elected a member of the London Mathematical Society on 19 February 1973, died on 28 July 2002, aged 55.

GEORGE BARNARD

Professor George A. Barnard, who was elected a member of the London Mathematical Society on 1 March 1945, died recently, aged 86.

ROBERT HIORNS

Dr Robert W. Hiorns, who was elected a member of the London Mathematical Society on 14 June 1991, died on 30 June 2002, aged 65.

RECORDS OF PROCEEDINGS AT MEETINGS

ORDINARY MEETING

held on *Friday 23 August 2002* at the Continental Grand Hotel, Beijing, on the occasion of the International Congress of Mathematicians. At least 120 members and guests were present.

The meeting began at 6.45 pm, with Professor T.J. LYONS FRS, Vice-President, in the Chair. Professor Lyons welcomed members and guests: the meeting provided an opportunity for overseas members to meet other members of the Society. He gave a particular welcome to two Honorary Members present: Professor Shiing-Shen Chern, Foreign Member of the Royal Society, Honorary President of the Congress, and Professor David Mumford. He then welcomed guests, with a special welcome to Professor Jacob Palis, President of the International Mathematical Union, Philip A. Griffiths, its Secretary, Zhi Ming Ma, Organiser of the Congress, and Daigien Hi, Organiser of the General Assembly of the International Mathematical Union in Shanghai.

Seven people were elected to Ordinary Membership: D. Cariolaro, L.J. Cummings, M.I. Gálvez Carrillo, R.J. Gibbens, D.A. Lavis, S.F.C. O'Rourke, C.J. Sangwin; and three people were elected to Associate Membership: A.J. Joyce, A.M Rafailidis, K.A. Thompson. Eleven members signed the membership book. The meeting was followed by a reception.

INTERNATIONAL CONGRESS OF MATHEMATICIANS 2002 BEIJING

The 24th International Congress of Mathematicians was held in Beijing from 20 to 28 August 2002. The Opening Ceremony was held in the Great Hall of the People on 20 August, in the presence of President Jiang Zemin, President of the People's Republic of China.

Fields Medals were awarded to Laurent Lafforgue (Paris) for making a major advance in the Langlands programme, thereby providing new connections between number theory and analysis, and to Vladimir Voevodsky (IAS, Princeton) for developing new cohomology theories for algebraic varieties, thereby providing new insights into number theory and algebraic geometry. The Nevanlinna prize was awarded to Madhu Sudan (MIT) for contributions to probabilistically checkable proofs, to non-approximability of optimisation problems and to error-correcting codes.

Among the opening speeches was one by Li Lanqing, Vice Premier of the People's Republic of China, who said the following:

Today, mathematicians from all over the world are gathering here for the first International Congress of Mathematicians of the new millennium. On behalf of President Jiang Zemin and the Chinese government, I have the pleasure to extend to you our warm welcome.

No one could have imagined the extraordinary evolution of science and technology over the past century. Space exploration, nuclear energy, computers and information technology, not to mention biological engineering, are all milestones that mark a new era of knowledge for humankind. Our social progress depends on scientific innovation, and mathefundamental to science. matics is Mathematics expressed the theory of relativity and quantum mechanics in the early 20th century; since then mathematicians have played a vital role in inventing computers, designing space and energy programs, and investigating the structure of DNA molecules. Mathematics is the language of the universe. Mathematical methods are used extensively in economics, medicine, agriculture, architecture, arts and all other fields of modern knowledge. As Roger Bacon pointed out, mathematics is the key to all branches of science. Today mathematics is the keystone of high technology, and, in a sense, the symbol of modern civilization.

In this light, the Chinese government is especially delighted to see this congress being held in Beijing. As President Jiang Zemin clearly expressed when he met with Professor Shiing-Shen Chern, IMU President Palis and other mathematicians in October 2000, "The Chinese government fully supports hosting the 2002 International Congress of Mathematicians in Beijing. China wishes to take this opportunity to promote math research and education in the country, in an effort to bring them up to the world advanced level in the early 21st century and lay a solid foundation for the future progress of science and technology in China."

As a developing country, China is marching on the road toward modernization. It has been a century-long pursuit for the Chinese people to revitalize their country through the development of science and education. This historical process has been even further accelerated in the last two decades by reforms and open policies, as both young talents and accomplished experts emerge in great numbers on the international scientific scene. The Chinese government has fully supported all endeavors to pursue this development, including a series of programs launched nationwide to promote basic scientific research, especially in mathematics. For example, in the past four years, the National Science Foundation of China has doubled its funding for mathematics, and the government has allocated thousands of millions of yuan to support the Pilot Knowledge Innovation Program in the Chinese Academy of Sciences.

We are aware that China has a long way to go before reaching the world's advanced level in science and technology. Science knows no boundaries. The advancement of science requires peace, stability and cooperation. In this regard, I believe that the International Congress of Mathematicians, with over a hundred years of tradition, sets the example. Hosting the 24th Congress in Beijing is a good opportunity for Chinese scientists to learn from and to cooperate with their colleagues abroad. I hope that this congress will mark a new starting point for further development of mathematics and science in China. As the first congress ever held in a developing country, I also hope that this congress will inspire a new era of international cooperation for the global scientific community.

In about 10 minutes' time, the new Fields medallists and the winner of the Nevanlinna Prize will be announced and awarded. I would like to take this opportunity to offer them my sincere congratulations. Their achievements not only represent their distinguished contributions to mathematics, but to world co-operation and the well-being of all humankind.

In conclusion, I wish this congress a great success, and all our guests a memorable stay in China.

Further information about the Congress can be found on its website (www.icm2002.org.cn).

PAN-AFRICAN CONGRESS OF MATHEMATICANS

Preliminary Announcement

The sixth Pan-African Congress of Mathematicians will take place in Carthage, Tunisia, from 1 - 6 September 2004. Its theme will be "Mathematical Sciences and the Development of Africa: challenges for building a knowledge society in Africa".

The President of the African Mathematical Union is Jan Persens (University of the Western Cape, South Africa) and the Chairman of the Organising Committee is Abderrahman Boukricha (University of Tunis) from whom further information can be obtained (aboukricha@fst.rnu.tn).

ICME 10 - DENMARK 2004

The 10th International Congress on Mathematical Education will be held from 4 - 11 July 2004 in Copenhagen, Denmark. Fuller information is available on the web (www.ICME-10.dk).

EDINBURGH MATHEMATICAL SOCIETY MEETINGS

The following meetings have been arranged for the Edinburgh Mathematical Society in Session 2002-2003:

2002

18 October 15 November 6 December 2003	(Edinburgh, AGM) (Strathclyde) (Napier)	Professor J.H. van Lint Professor A.M. Stuart Professor D. Dritschel
17 January 14 February 7 March 2 May	(Edinburgh) (Stirling) (Abertay) (Edinburgh)	Professor J.H. Davenport Dr M.R. Jerrum Professor J.F. Toland Joint meeting with British Society for the
30 May	(Aberdeen)	History of Mathematics Dr A.N. Skorobogatov

For further information contact Philip Heywood, Honorary Meetings Secretary, EMS, Department of Mathematics and Statistics, University of Edinburgh, James Clerk Maxwell Building, The King's Buildings, Mayfield Road, Edinburgh EH9 3JZ (e-mail: philip@maths.ed.ac.uk).

New textbooks from





www.springer.de/math/

Springer

G.-M. Greuel, G. Pfister

A SINGULAR Introduction to Commutative Algebra

This book can be understood as a model for teaching commutative algebra, and takes into account modern developments such as algorithmic and computational aspects. It includes a CD containing SINGULAR as well as the examples and procedures explained in the book.

2002. XVIII, 588 p. With CD-ROM. Softcover € 39,95; £ 28,-; sFr 68,50 ISBN 3-540-42897-6

K. Fritzsche, H. Grauert

From Holomorphic Functions to Complex Manifolds

In a clear and understandable manner the authors' familiarize the reader with the most important branches and methods in complex analysis of several variables. The abstract concepts involving sheaves, coherence, and higher-dimensional cohomology have been completely avoided.

2002. XV, 392 pp. 27 figs. (Graduate Texts in Mathematics. Vol. 213) Hardcover € 64,95; £ 45,50; sFr 108,- ISBN 0-387-95395-7

J. Matousek

Lectures on Discrete Geometry

This book is primarily a textbook introduction to various areas of discrete geometry. In each area, it explains several key results and techniques, in an accessible and concrete manner.

2002. XVI, 481 pp. 206 figs. (Graduate Texts in Mathematics. Vol. 212) Softcover € 44,95; £ 31,50; sFr 77,- ISBN 0-387-95374-4

G. Toth

Glimpses of Algebra and Geometry

This book is intended for a "Bridge Course" that facilitates the transition between undergraduate and graduate studies. The new edition includes innumerable improvements throughout the text.

2nd ed. 2002. XXII, 450 pp. 183 figs., 18 in color. (Undergraduate Texts in Mathematics) Hardcover € 64,95; £ 45,50; sFr 108,- ISBN 0-387-95345-0

M. Aquilar, S. Gitler, C. Prieto

Algebraic Topology from a Homotopical Viewpoint

This carefully written book can be read by any student who knows some topology. It will be a useful place to quickly learn this novel homotopy-theoretic point of view of algebraic topology.

2002. XXIX, 478 p. (Universitext) Hardcover € 79,95; £ 56,-; sFr 133,- ISBN 0-387-95450-3

M. Rosen

Number Theory in Function Fields

This book studies the relationship between number theory in algebraic number fields and algebraic function fields. Because function fields are a bit different from number fields, even the experienced number theorist will learn from this book. Algebraic geometers will like the book, since the geometry of curves over an algebraically closed field is both pretty and elementary.

2002. XII, 358 pp. (Graduate Texts in Mathematics. Vol. 210) Hardcover € 54,95; £ 38,50; sFr 94,50 ISBN 0-387-95335-3

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Publisher of the journal Experimental Mathematics

Number Theory for the Millenium

Edited by M. A. Bennett, et al.

Volume 1: \$50.00 Volume 2: \$50.00 Volume 3: \$50.00

These proceedings review some of the major number theory achievements of the last century and set the pace for the new century. These volumes will serve as a useful reference to researchers and as an introduction to current topics in number theory for a general mathematical audience.



Surveys in Number Theory: Papers from the Millennial Conference on Number Theory

> Edited by M. A. Bennett, et al. \$39.00

UNIVERSITY of ABERDEEN

Two Lectureships in Pure Mathematics £20,470— £32,537 per annum (pay award pending)

Applications are invited for two lectureships in the DEPARTMENT OF MATHEMATICAL SCIENCES. At least one of these appointments may be made at a higher level for a suitably qualified candidate. The Department gained a Grade 5 rating in Pure Mathematics in the 2001 UK Research Assessment Exercise and it contains a Research Centre for Topology and Related Areas. The successful candidates will be expected to play a major role in the development of research in Pure Mathematics and to contribute to teaching and supervision at all levels. Preference may be given to applicants whose research activities relate to those of the current researchers in topology, geometry and analysis, but candidates with a strong research record in any area of Pure Mathematics are encouraged to apply. Informal enquiries are welcome and should be directed either to Prof. Robert Archbold (Head of Mathematical Sciences, tel. 01224 272756, email: r.archbold@maths.abdn.ac.uk) or to Professor John Hubbuck (tel. 01224 272757, email: j.hubbuck@maths.abdn.ac.uk).

Closing date: 1 November 2002.



Further Information may be obtained at the Web site: http://www.maths.abdn.ac.uk. Application forms and further particulars are available from Human Resources, University of Aberdeen, King's College, ABERDEEN AB24 3FX, telephone (01224) 272727, quoting reference number FMA030A. A 24-hour answering service is in operation. Promoting Diversity and Equal Opportunities throughout the University

FLOODS AFFECT CHARLES UNIVERSITY LIBRARY

The recent floods in the Czech Republic and, particularly, in Prague, heavily hit the Czech mathematical community. The largest mathematical library in the country was located in the building of the Faculty of Mathematics and Physics, Charles University at Karlín, the most damaged part of Prague. It contained books and journals from all fields of pure and applied mathematics, statistics, numerical analysis and computer science. About two thirds of the books and journals in the library were heavily damaged and, despite all efforts, are almost surely lost. Among them were five thousand books and monographs from recent decades, plus almost 400 journal titles: there were also thousands of historical books from the last three centuries, which cannot be bought any more (including, e.g., the first edition of collected works of Cauchy, Weierstrass and Riemann). Taking into account that a large part of the country was extensively damaged by the flood, we must expect that to collect money needed for the reconstruction of the library will be very difficult. While texts for undergraduate study can be reprinted, it will be impossible to buy again books needed for graduate students as well as books and journals for research.

In this difficult situation we address our colleagues abroad with a request for help, which may be provided in several ways. A donation of spare copies of books and journals (in particular those from the list at the Faculty web pagesee below) would be an immense assistance for us. Books and (issues of) journals can be sent directly to the library of the Faculty. We are also negotiating several places abroad where the publications could be collected and then transported in bulk to Prague.

We want to ask publishers and libraries for complimentary copies of the lost publications which have been

bought, received in exchange or obtained for reviewing in the past (e.g. those in the 'Recent Books' section of the EMS Newsletter edited in Prague). The support of colleagues everywhere would be very helpful. Financial contributions would be very much appreciated because they would allow a targeted renewal of the destroyed library resources. Gifts of books or money contributions are free of tax and customs in our country so long as the Faculty receives a letter from the donor declaring that the gift was sent to help the library of the Faculty.

Addresses and contacts: Charles University, Faculty of Mathematics and Physics, Ke Karlovu 3, 121 16 Praha, Czech Republic. Contact persons: Daniel Hlubinka (hlubinka@karlin.mff.cuni.cz); Jiri Rakosnik (rakosnik@math.cas.cz); Jiri Vesely (jvesely@karlin.math.cuni. cz.).

Relevant web pages:

http://www.mff.cuni.cz/toISO-8859-2.en/vnitro/povoden/ (the list of perished books from recent decades and of lost journal series, plus a lot of further information that will be regularly updated)

http://faculty.washington.edu/~kulich /flood/library.html (the web page of Dr Michal Kulich containing the list of local help coordinators in the USA).

Money can be sent either by a cheque payable to Charles University in Praha, Faculty of Mathematics and Physics or by a money transfer to the following account: CSOB, Prague 1, Na Porici 24, account No. 01256280/0300, Reference: 999, SWIFT: CEKO CZ PP PRA.

Jiri Rakosnik Mathematical Research Section Union of Czech Mathematicians and Physicists

[Editor's note: The LMS is arranging for sets of its journals to be provided to the Charles University.]

IMA GOLD MEDALS 2002

The Institute of Mathematics Gold Medals are awarded by the Institute of Mathematics and its Applications (IMA) in alternate years in recognition of outstanding contributions to mathematics and its applications over a period of years. This year the panel of adjudicators appointed by the IMA President awarded medals to two Fellows of the Institute.

Professor K.W. Morton

Bill Morton is internationally recognised for the quality of his scholarship in numerical analysis and methods, especially in the solution of partial differential equations in the area of computational fluid dynamics. He built up and led significant research groups at the UKAEA Culham Laboratory and at the Universities of Reading and Oxford. Bill Morton has made many contributions to the UK mathematics community including editing the IMA Journal of Numerical Analysis, setting up the International Conference in Fluid Dynamics series and serving as an Institute Vice President.

Professor F.C. Piper

Fred Piper has achieved international recognition for his work in the application of mathematics to problems of information security carried out at Royal Holloway and Westfield Colleges. He recognised at an early stage in his career the importance of the application of discrete mathematics to the emerging technologies of computer and information systems. Fred Piper has been at the forefront in the development of information security in the public arena and opened up the area for collaborative research between mathematicians in academia and industry. He was responsible for initiating the long-running and successful series of IMA conferences on Cryptography and Coding. He has provided direction to more than 50 young research members who today form a network of research workers in senior positions in universities and industry.

MEETING OF THE NORTH BRITISH FUNCTIONAL ANALYSIS SEMINAR

A meeting of the North British Functional Analysis Seminar will be held in the Mathematics Building. University of Glasgow from 2.30 pm Friday to 12 noon on Saturday 1-2 November. Talks will be by Professor László Zsidó (Seconda Universitá di Roma "Tor Vergata", Italy) on 'Analytic generators and applications to operator theory and operator algebras' and Professor Victor Nistor (Pennsylvania State University, USA) on 'Manifolds with a Lie structure at infinity' and 'Applications to spectral theory and boundary value problems'. The meeting is supported financially by the LMS and all are welcome to attend. For further information, please contact Michael Dritschel, Newcastle Dr University (M.A.Dritschel@ncl.ac.uk).

PATTERNS, NONLINEAR DYNAMICS AND APPLICATIONS (PANDA)

A one-day meeting on aspects of pattern formation and nonlinear dynamics, funded by the LMS, will be held on Friday 18 October in the Department of Applied Mathematics and Theoretical Physics (DAMTP), University of Cambridge.

There will be two pedagogical lectures, aimed at research students, concerning the nonlinear dynamics of mode interactions and Faraday waves, given by Jonathan Dawes (Cambridge) and Anne Skeldon (Surrey) respectively. Other speakers will include Edgar Knobloch (Leeds) and Paul Matthews (Nottingham). Postdoctoral researchers and research students are warmly encouraged to attend. Further details, including abstracts, travel information and maps, can be found on the web (http://www. damtp.cam.ac.uk/user/jhd 1002/panda). Further details are available from Jon Dawes (J.H.P.Dawes@ damtp.cam.ac.uk).

LONDON MATHEMATICAL SOCIETY

BRITISH SOCIETY FOR THE HISTORY OF MATHEMATICS

Joint Meeting

THE FOUR-COLOUR PROBLEM

Wednesday 23 October 2002

Cruciform Building, Lecture Theatre 1 University College London, Gower Street, London WC1

2.10 - 2.55	Robin Wilson: The four-colour problem: 1852-1940
	[from Augustus De Morgan's letter to Henri Lebesgue's
	paper of 1940]
3.00 - 3.45	Kenneth Appel and Wolfgang Haken:
	Solving the four-colour problem
	[from Heesch's contributions to the mathematical and
	computational aspects of the Appel-Haken solution]
3.45 - 4.15	Tea (North Cloisters)
4.15 - 4.25	LMS business
4.25 - 5.10	Dan Archdeacon:
	From the Heawood conjecture to topological graph theory
	[from the Ringel-Youngs solution of the Heawood conjecture
	to current developments in topological graph theory]
5.15 - 6.00	Robin Thomas: The four-colour theorem and beyond

[the Robertson-Seymour-Sanders-Thomas proof, recent progress on some generalisations, and equivalent formulations inside and outside graph theory]

A dinner will be held at The Old Amalfi Restaurant, 107 Southampton Row, London WC1 at 7.30 pm. The cost will be £24 per person, inclusive of wine, and a reception at De Morgan House beforehand. Those wishing to attend should inform Susan Oakes, Administrator, London Mathematical Society, enclosing a cheque payable to the 'London Mathematical Society' to arrive no later than Friday 18 October.

There are limited funds available to contribute in part to the expenses of members of the Society or research students to attend the meeting. Requests for support may be addressed to the Programme Secretary, London Mathematical Society (e-mail: grants@lms.ac.uk). Requests should include an estimate of expenses and a very brief *curriculum vitae*; research students should include brief letters of endorsement from their supervisors.

London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HS (tel: 020 7637 3686, e-mail: oakes@lms.ac.uk)

OXFORD UNIVERSITY PRESS

A Partnership in Mathematics



Applied Picard-Lefschetz Theory

Vassiliev

Vassiliev presents several versions of the Picard-Lefschetz theory, and also illustrates how these versions of the theory are used in studying a variety of problems arising in many areas of mathematics and mathematical physics.

Mathematical Surveys and Monographs No.97 November 2002, 352 pages Hardback, 0-8218-2948-3, £55.25

Discrete Mathematics

Second Edition

Norman Biggs

This much-awaited new edition of Biggs' bestselling text includes new chapters on statements and proof, logical framework, and natural numbers and the integers, in addition to updated chapters, over 1000 tailored exercises and an accompanying website containing hints and solutions to all exercises.

December 2002, 570 pages Paperback, 0-19-850717-8, £29.50 Hardback, 0-19-850718-6, £55.00

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Combinatorics of Nonnegative Matrices

Sachkov & Tarakanov

This book discusses the combinatorial properties of nonnegative matrices, and presents a summary of the existing material. It provides a good entry point into the subject and includes exercises to aid students.

Translations of Mathematical Monographs No.213 November 2002, 269 pages Hardback, 0-8218-2788-X, £69.25

Invitations to Geometry and Topology Martin R. Bridson & Simon M. Salamon

The topics covered in this text range from Morse theory and complex geometry theory to geometric group theory, and are accompanied by exercises that are designed to deepen the reader's understanding and to guide them in exciting directions for future investigation.

Oxford Graduate Texts in Mathematics No.7 June 2002, 340 pages, 33 line drawings Hardback, 0-19-850772-0, £37.50



Local Fields and Their Extensions

A Constructive Approach

Fesenko

This edition incorporates improvements to the first edition, with 60 additional pages reflecting several aspects of the developments in local number theory.

Translations of Mathematical Monographs No.121 September 2002, 345 pages Hardback, 0-8218-3259-X, f 48 25

System Control and Rough Paths Terry Lyons

Lyons describes a completely novel mathematical development that has already influenced probability theory, and has potential for application to engineering and to areas of pure mathematics.

Oxford Mathematical Monographs August 2002, 250 pages Hardback, 0-19-850648-1, £50.00

LONDON MATHEMATICAL SOCIETY REGIONAL MEETING WALES 2002

CYFARFOD RHANBARTHOL CYMDEITHAS MATHEMATEGOL LLUNDAIN CYMRU 2002

A workshop on Contemporary Aspects of Mathematical Physics will be held at Gregynog Hall from 22 to 25 November, and will be followed by a Society regional meeting whose speakers will include Sir Michael Atiyah (Edinburgh) and Vaughan Jones (Berkeley) on Monday afternoon 25 November. Full details of the Society regional meeting will be given in due course.

The workshop speakers preceding the regional meeting will include: Sir Michael Berry (Bristol), Robbert Dijkgraaf* (Amsterdam), Franco Flandoli (Pisa), Juerg Frohlich* (Zurich), Masatoshi Fukushima (Osaka), Gary Gibbons* (Cambridge), Uffe Haagerup (Odense), Lou Kauffman (Chicago), Gus Lehrer* (Sydney), Terry Lyons (Oxford), Tetsuji Miwa (Kyoto), Leonid Pastur (Paris), John Roberts* (Rome), Vladimir Turaev (Strasbourg), Wendelin Werner (Paris) and Jean-Bernard Zuber (Saclay). (*to be confirmed)

Part of the workshop will celebrate the 87th birthday of Emeritus Professor Neville Temperley and his contributions to Mathematical Physics. Professor Temperley was head of the Applied Mathematics Department at Swansea for 17 years until his retirement in 1982. He received the Rumford Medal of the Royal Society in 1992.

The workshop will start around 11.30 on the morning of Friday 22 November and end at lunch time on 25 November. It is intended that participants will stay at Gregynog Hall for c. £49.50 per night including meals, c. £19.80 for students. The conference dinner will be on the Sunday evening, 24 November. The extra cost for this will be c. £10 for those staying at Gregynog and c. £22.50 for those staying elsewhere. If Gregynog becomes full, we expect that accommodation will be available in Newtown, which is about five miles from Gregynog.

For further information regarding accommodation or to request a reservation for accommodation, contact Dr Edwin Beggs (Swansea) E.J.Beggs@swansea.ac.uk before 1 October. It will be possible for members of the Society to apply for help with their travel costs.

More information about the programme can be obtained from the scientific organisers:

- * Professor David E. Evans (Cardiff) EvansDE@cardiff.ac.uk
- * Professor Aubrey Truman (Swansea) A.Truman@swansea.ac.uk

or visit http://www.cf.ac.uk/maths/opalg/lmsmeeting-e.html

There will be the possibility of submitting short talks and posters. We welcome posters from graduate students and hope to award a prize to the best poster submitted by a student.

There are limited funds available to contribute in part to the expenses of members of the Society or research students attending the Society Meeting on Monday 25 November. Requests for support may be addressed to the Programme Secretary, London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HS (email: grants@lms.ac.uk). Requests should include an estimate of expenses and a very brief *curriculum vitae*; research students should include brief letters of endorsement from their supervisors.

EUROPEAN MATHEMATICAL INFORMATION SERVICE

The idea of the European Mathematical Information Service (EMIS) was conceived at a meeting of the executive committee of the European Mathematical Society in Cortona in 1994. By June 1995, EMIS was up and running. The simplest way to learn about EMIS is to go to the web (www.emis.de). You will see a screen with information about the European Mathematical Society on the left. On the right you will find access to Zentralblatt MATH, other databases, projects and the electronic maths library.

The pages accessed directly from the left-hand side, dealing with the EMS itself. are maintained by Volker Mehrmann and Christian Mehl (Technical University, Berlin) for the EMS. There you can find out about the Society, its officers and subcommittees. Masochistic surfers can fight their way through the statutes and bylaws. Further, there are links to mathematics departmental addresses, a list of vacant posts (maintained by Sigmundur Gudmundsson at Lund), a calendar of mathematics conferences and, importantly, an application form for individual membership. If you have a conference you want to advertise, you may use the webpage to submit the details.

Now for a summary of the right-hand side, which is co-ordinated by Bernd Wegner (Technical University, Berlin). The linked databases are Zentralblatt MATH (the online version of Zentralblatt für Mathematik), MATHDI (the online version of Zentralblatt für Didaktik der Mathematik) and MPRESS. To get the full service from MATH and MATHDI, your library needs to subscribe. Otherwise you will be restricted to three hits per search. MPRESS is a guide to preprints on the web and is entirely free of charge.

Additionally, you can access the Jahrbuch project. This is a database under construction which will contain the whole Jahrbuch über die Fortschritte der Mathematik (1868-1942), the precursor of both Zentralblatt and Mathematical Reviews. The structure of the database will be similar to that of Zentralblatt MATH. Most of the articles and books reviewed in the Jahrbuch will be archived as images (gif format) but not as searchable text.

The electronic library is a free service. Whether a particular journal or book is included depends on whether it can be made freely available electronically. Quality is assured by a vetting procedure of the EMS electronic publications committee.

The principal projects with EMS involvement are LIMES and EULER. These are funded by the European Union as a result of grant applications by the EMS. The purpose of LIMES is to improve the Zentralblatt MATH database so that it becomes a (European-based) world class database for mathematics. Part of the aim is to improve access, particular in Eastern Europe, and to have more widely distributed centres for input and editorial decisions.

EULER is a project which has developed a search engine specialising in mathematics. Based on Zentralblatt, it will search using keywords, authors and dates. A successful search will provide you with a review and the location of the article or book. If the material is available electronically, there is a link to that as well. Go to EMIS, access EULER, type in a combination of keywords, and see what happens.

Additionally, EMIS gives access to a project called 'Electronic Geometry Models', an archive "for any geometer to publish new geometric models, or to browse for material to be used in education and research".

Space does not permit more, but it would be wrong to conclude without mentioning the financial and logistic support of FIZ Karlsruhe and the sterling work of Bernd Wegner, editor in chief of Zentralblatt, scientific editor of EMIS and moving spirit in most of what has been described in this article.

> David Salinger EMS Publicity Officer

LONDON MATHEMATICAL SOCIETY

Friday 15 November 2002

The Mathematical Institute at the University of Oxford announces the following colloquium in conjunction with an Ordinary Meeting of the London Mathematical Society.

Professor Sandy Green will be awarded the De Morgan Medal of the London Mathematical Society

Professor Peter Sarnak (Courant Institute of Mathematical Sciences, New York, USA)

The meeting and talk will be in Lecture Room 2 (L2) with business commencing at 4.30 pm at which point Professor Sandy Green will be awarded the De Morgan Medal of the Society, followed by the colloquium by Professor Peter Sarnak. Colloquia are aimed towards a general mathematical audience.

The colloquium will be followed by an informal reception designed to give people the opportunity to have more informal contact with the speaker.

For further information contact Christine Webb, Mathematical Institute, 24-29 St Giles', Oxford OX1 3LB (webb@maths.ox.ac.uk, tel: 01865 273525) or Susan Oakes, London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HS (oakes@lms.ac.uk, tel: 020 7323 3655).

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Warwick Symposium 2002/3

Geometric and Probabilistic Aspects of Dynamical Systems

Organisers: Adam Epstein, Oleg Kozlovski, Omri Sarig, Sebastian van Strien, Peter Walters.

Activities will take place over the whole year and there will be a number of Workshops held in the university vacations as follows.

9-13 December 2002: Real and Complex One-dimensional Dynamics organised by Oleg Kozlovski and Sebastian van Strien.

7-12 April 2003: Holomorphic Dynamics organised by Adam Epstein.

7-18 July 2003: Symbolic Dynamics and Ergodic Theory organised by Omri Sarig and Peter Walters. Topics will include finite and countable state Markov systems, adic transformations, interval exchange transformations, and applications of symbolic dynamics to geometric measure theory, number theory, hyperbolic geometry, etc.

21-25 July 2003: Geometric Aspects of Dynamical Systems organised by Oleg Kozlovski and Sebastian van Strien. Topics will include non-hyperbolic systems, and the structure of attractors.

More information on the meeting can be found at

http://www.maths.warwick.ac.uk/research/symposium.html

or e-mail: dynsym@maths.warwick.ac.uk

We welcome people to come for longer visits than a workshop. PhD students are particularly welcome to attend for longer periods. A programme of mini courses on a wide range of topics - from April to June 2003 - should make such a long visit very attractive. Financial support is available through Marie Curie Fellowships, the ESF PRODYN programme and the EPSRC.

The Symposium is jointly funded by the EPSRC and the ESF programme PRODYN.

DIRAC DAY - CAMBRIDGE

Paul Adrian Maurice Dirac OM (1902-1984) was one of the greatest scientists of the twentieth century. His life spanned much of the century and he was responsible for making several of the major steps towards understanding the quantum nature of atoms and subatomic particles. He was elected to the Royal Society in 1930, to the Lucasian Professorship in Cambridge (once held by Newton) in 1932, and shared the 1933 Nobel Prize for Physics with Erwin Schrödinger: alongside Newton, Maxwell and others, he is honoured by a plaque on the floor of Westminster Abbey - indeed his memorial contains the Dirac equation, the only equation anywhere in the Abbey. He retired from the Lucasian Professorship in 1969 to Florida State University in Tallahassee, where he continued to work until his death in 1984.

The Dirac Centennial Celebration at the Centre for Mathematical Sciences, University of Cambridge on 20 July 2002 was timed to follow 'Strings 2002', which was entirely apt since many of Dirac's ideas are central to string theory and its developments. The talks were designed not only to provide an overview of Dirac's work and its consequences but also to allow us glimpses of his character and home life.

Sadly, Dirac's wife died shortly before the meeting thus preventing his daughter Monica from providing her reminiscences. Instead, his granddaughter, Victoria, led us through a selection of her mother's memories of Dirac as a devoted family man, with a strong interest in gardening, growing vegetables during war-time, enjoying classical music, swimming in rivers or lakes, long walks and helping his children with their homework. We learned that he disliked sudden noises and considered that 'no one can work more than four hours a day'. He was famous for his reticence and stories abound relating to his apparently solitary nature and distinctive manner of thinking.

Peter Goddard, the Master of St John's College (Dirac's college), provided a wonderful biography, punctuated by many anecdotes and amusing asides. We were reminded of Dirac's early education in Bristol (and we learned that Cary Grant had been one of his contemporaries at school) where he took degrees in both Electrical Engineering and Mathematics before obtaining a grant to go to Cambridge as a graduate student under R.H. Fowler. There, it was Fowler who realised the importance of Heisenberg's formulation of quantum mechanics and encouraged Dirac to study it after attending a seminar given by Heisenberg in July 1925. In October of the same year, during a now famous walk on the Gog Magog hills near Cambridge, Dirac realised the connection between Heisenberg's commutation relation and the classical Poisson bracket of position and momentum which allowed him to establish rules for quantisation based on replacing the classical Poisson bracket of two dynamical variables by their commutator. This deceptively simple remark led him to solve many of the then outstanding problems of atomic theory. Soon afterwards. Schrödinger's formulation of quantum mechanics in terms of wave-functions appeared. At first sight, the new formulation seemed to be very different from that of Heisenberg and Dirac. However, Dirac responded by setting out what has now become the standard mathematical framework and demonstrated that the Heisenberg-Dirac and Schrödinger formulations were merely different descriptions of the same mathematical entities related by changes of coordinates. Dirac's approach now forms the basis of atomic physics, and thus also for most of chemistry and condensed matter physics.

Shortly after this, Dirac turned his attention to the electromagnetic field and showed how his framework led naturally to the concept of photons. In so doing, he also made the first steps towards the creation of quantum field theory, which provides the currently most successful framework for the description of elementary particle interactions - provided, of course, as Edward Witten of the Institute of Advanced Study in Princeton reminded us, we ignore gravity, which simply does not fit properly with quantum field theory. Successful as it is, Dirac never regarded it as satisfactory because of the necessity of dealing with infinities in what he regarded as an ad hoc manner.

In 1927 there was also a lack of fit problem because the formulation of quantum mechanics was decidedly non-relativistic yet electrons could be accelerated to high speeds. Dirac's solution to this problem is as astonishing today as it was in 1928. By insisting the wave equation for the electron should be linear in spatial derivatives (allowing Lorentz transformations to mix all the coordinates), he was led to a four-component wave function, which not only incorporated the correct spin of the electron but also led him to predict the existence of a new particle having the same mass but opposite charge - the positron. Nowadays, as Ian Halliday the Chief Executive of PPARC reminded us, the existence of anti-matter is taken for granted, and beams of positrons have become a routine tool at CERN and other high energy physics laboratories. However, in Dirac's day, as Heisenberg said, the prediction of anti-matter was 'the most decisive discovery in connection with the properties or the nature of elementary particles ... [It] changed our whole outlook on atomic physics completely'.

A characteristic feature of Dirac's work was his ability to invent mathematical tools whenever necessary to do so. An outstanding example of this was his introduction of the delta function which led later to the theory of generalised functions and distributions. A subtler example is provided by his relativistic equation for the electron. Sir Michael Atiyah's talk emphasised the relationship between the massless Dirac equation and quaternions and argued convincingly that the three principal areas of mathematics, algebra, geometry and analysis, together with theoretical physics, could be considered as different facets of the same concepts. Certainly, the massless Dirac operator has become a key tool in the study and classification of manifolds in four dimensions. In 1931, Dirac noted how it was possible to modify the formulation of electrodynamics to allow for the existence of

magnetic monopoles. Isolated magnetic poles have not been observed to date so it would appear that Dirac's idea is not relevant. However, more recent work by Wu and Yang, 't Hooft and Polyakov has demonstrated that Dirac's work provided the first example of the role topology might play in quantum field theory.

Contemporary efforts to find a framework which may encompass all the forces of nature, including gravity, centre around string theory. Both Edward Witten and Stephen Hawking (the current Lucasian Professor), although in rather different ways, spoke about modern work which may be regarded as directly influenced by Dirac. In 1971, Pierre Ramond discovered a 'stringy' generalisation of the Dirac equation which is a key feature of superstring theory; indeed, Witten referred throughout his talk to the Dirac-Ramond equation (much to the embarrassment of Pierre who was sitting next to me at the meeting). In his later works, Dirac explored an extended model of the electron in an attempt to explain the muon and he investigated quantum gravity. One wonders what he might have made of string theory. He was renowned for seeking simplicity or beauty in the equations describing physical laws but he was also blessed with profound insight. Unfortunately, he was already retired by the time string theory was proposed in the early seventies.

Peter Goddard suggested to the audience at the beginning of his talk that some might like to recount their own Dirac stories. I would like to end on a sad note provided by Pierre Ramond after the meeting. Based at the University of Florida in Gainsville he told me that he had come to know Dirac quite well after his move to Tallahassee, and from time to time they discussed physics together. On the last such occasion, Dirac declined an invitation to go to Gainsville to give a seminar on the grounds that he had nothing more to say. After a pause, he added that he felt disappointed he had not achieved so much in physics. That such a great man should come to such a conclusion is a truly humbling thought.

F.E. Corrigan

DIRAC DAY - BRISTOL

On the 100th anniversary of the birth of Paul Adrien Maurice Dirac, a meeting in celebration of the life and work of this great theoretical physicist and mathematician was held at the University of Bristol, on 8 August 2002, with the participation of one of Dirac's daughters, Dr Monica Dirac. (Sadly, Paul Dirac's widow Margit Wigner, Monica's mother, had died a few weeks earlier.)

Dirac was born in Bristol and was educated at Bishop's Road School, at Merchant Venturer's School (now Cotham School) and at the University of Bristol, where he studied in the Departments of Electrical Engineering and of Mathematics. Thereafter, Dirac's career was spent in Cambridge and latterly in Tallahassee, Florida. For his distinguished and innovative research work, Dirac was awarded the Nobel Prize jointly with Schrödinger in 1933.

The afternoon of the Dirac Day was devoted to four lectures on Dirac's work and on its influence, following a lively set of opening remarks by Michael Berry.

Professor Graham Farmelo, Science Museum, London, spoke on 'Paul Dirac: Poet Laureate of Modern Physics', referring to 'one of his greatest poems, the Dirac equation', which is quoted on the Dirac plaque in Westminster Abbey. The speaker referred also to Dirac's epoch-making prediction of the positron (anti-matter) and to his love of mathematical beauty as being essential in physics. In this task, a colleague of the speaker spoke frequently in Dirac's words, adding to the drama of the presentation.

Professor Paul Davies, University of Adelaide, spoke on 'Dirac's Big Numbers: The Mystery Deepens', drawing attention to Dirac's 1937 paper in *Nature* and to 10⁴⁰ as being the ratio of forces in the hydrogen atom and also the age of the universe in atomic units. The speaker also elaborated on the implication that there may be variations in the fundamental constants of the universe, as Dirac surmised.

Professor J.A.C. Bland, University of Cambridge, lectured on 'Spin electronics - the next revolution in semiconductor device technologies?', explaining that Dirac's prediction of an intrinsic spin of the electron enabled the development of the concept of electron spin being exploited in electronics instead of the charge. As well as outlining recent developments, the speaker discussed possibilities for future devices based on electron spin.

Dr Sajinder Luthra, Imaging Research Solutions Limited, Hammersmith, spoke on 'Positron Emission Tomography in Medical Diagnosis', discussing how PET scanning was developed and how its use continues in medical practice today. By use of injection into the body of a chemical labelled with the property of positron emission, radiation is emitted by positron-electron interaction; the structure of blood flows, for example, is obtained from the mathematical inverse problem. Thus anti-matter comes into its own in the everyday medical world, a tribute to Dirac's brilliant prediction!

Following the lectures, a number of us went down the hill to view the Dirac memorial by the Science Centre, another tribute to this great Bristol citizen.

A Dinner was held in the evening on the SS Great Britain, in the re-furbished 1st class Dining Room. Towards the end of the splendid dinner, Monica Dirac spoke movingly of life in Cambridge and elsewhere with her father, a talk which she would have given at the Cambridge Dirac meeting on 20 July had she been able to be present.

Those attending the meeting and the dinner were appreciative of the tremendous support, financial and otherwise, given by the Institute of Physics Publishing and by the South West Branch of the Institute of Physics. From the Department of Physics, Sir Michael Berry and Vince Smith worked hard to make the whole event an enjoyable occasion.

The LMS was represented by its President and by its new Executive Secretary, Peter Cooper, who helped to arrange the meeting before leaving the IOP.

> J.T. Stuart President



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Bruce Berndt and Robert Rankin

This book contains essays on Ramanujan and his work that were written especially for this volume. It also includes important survey articles in areas influenced by Ramanujan's mathematics. Most of the articles in the book are nontechnical, but even those that are more technical contain substantial sections that will engage the general reader.

History of Mathematics No.22 Hardback, 0-8218-2624-7, £48.00 £38.40 February 2002, 347 pages

ROYAL SOCIETY MEDIA COURSES

As the UK's national academy of science, part of the Royal Society's mission is to promote constructive dialogue between science and society. The programme of media and communication skills training aims to:

- develop and enhance the communication skills of postdoctoral UK scientists;
- provide them with support to communicate their science effectively and
- facilitate and promote constructive engagement between the scientific community, media, general public and schools.

Media Training Course (1 day course) The media - print and broadcast - is a powerful, readily available vehicle for scientists to reach a wide audience. This is an excellent introduction to working with the media with lots of information and practical sessions built in. Participants will enjoy being a reporter for an hour, find out what makes news 'news', write and review their own press release and learn and practise interview techniques with a BBC broadcast journalist. The course builds both knowledge of the media and confidence in interacting with it.

Communication Skills Training (2 day course) Good communication - to other scientists as well as to the lay audience - is an essential professional competence. This is a course to sharpen writing and editing skills and to polish presentation techniques. Day one of the course will focus on written communication with many practical sessions built in. Participants will find out what constitutes 'good writing' and common pitfalls when writing about science. There will be an opportunity to draft written pieces for differing audiences ranging from a woman's magazine to a feature for a national daily newspaper, as well as an introduction to editing. Day two will concentrate on spoken communication: how to structure a talk, why the visual aspects of communication are so important and

how to prepare visual aids. Much of the second day will be devoted to coaching participants in presentation skills - with the emphasis on adequate rehearsal, clear, jargon free delivery and a telling performance.

All courses, with the exception of those in January, will be held at the Royal Society:

- Media Training Thursday 24 October
- Communication Skills Training -Wednesday 6 and Thursday 7 November
- Media Training: Thursday 21 November
- Communication Skills Training: Monday 9 and Tuesday 10 December
- Media Training followed by Communication Skills Training (John McIntyre Centre, University of Edinburgh): Wednesday 29, Thursday 30 and Friday 31 January 2003
- Media Training: Friday 21 Feb
- Communication Skills Training: Thursday 27 and Friday 28 February

The courses cost £200 for the one-day Media Training course and £500 for the two-day Communication Skills training course. To register for these courses first check availability by contacting Suzi White (suzi.white@royalsoc.ac.uk). You will then need to fill in the online form (http://www.royalsoc.ac.uk/funding/). Payment for the course is required in full at the time of registration. These courses are fully subsidised by the Royal Society for all Royal Society Research Fellows.

The courses are open to all actively researching postdoctoral scientists working in the UK. EPSRC considers the Royal Society its preferred communication course provider. If you are about to submit an application for EPSRC funding, remember to apply to the Public Communication Training Fund which will provide you with a bursary of £500 to go on such a course. For more details of the PCTF visit www.epsrc.ac.uk and click on the 'public awareness' flag. PPARC is glad to participate in this training course. If your research is funded by PPARC or you work in an area eligible for PPARC funding you may be able to obtain a bursary to attend this course. For more details visit www.pparc.ac.uk and click on the 'public understanding' flag.

VISIT OF PROFESSOR I. BORISOV

Professor I. Borisov (Novosibirsk, Russia) will the visit Department of Mathematical Sciences at Brunel University, from 6 - 20 December. He is also expected to give talks at Cambridge and Oxford Universities. The visit is supported by an LMS scheme 5 grant. For further information, contact Dr S. Novak at Brunel University (http://www.bru nel.ac.uk/~mastssn/home.htm).

VISIT OF PROFESSOR A. VOLCIC

distinguished Italian analyst, The Professor A. Volcic of the University of Trieste, will visit Oxford, Reading and London in October under a Scheme 2 grant of the LMS. His lecture in Oxford will be at 5 pm on Tuesday 15 October in the Mathematical Institute, his lecture in Reading at 4.30 pm on Monday 14 October in the Mathematics Department, and at Queen Mary, University of London at 4.30 pm on Thursday 17 October. In London and Reading, Professor Volcic will give a lecture accessible to a general mathematical audience entitled 'Mathematical Computerized Tomography and Geometric Tomography' and in Oxford his lecture will be addressed to Functional Analysts and be entitled 'Kakutani's Refinement and its Generalisations'.

For further information please check with the appropriate local organiser: Reading: Professor Wright (j.d.m.wright @reading.ac.uk), London: Professor Chu (maa01chc@gold.ac.uk), Oxford: Professor Batty (charles.batty@st-johns.oxford. ac.uk).

VISIT OF PROFESSOR D. BAKIC

Professor Damir Bakic of the University of Zagreb will visit Oxford, Reading and London in October. His lecture in Oxford will be at 5 pm on Tuesday 29 October in the Mathematical Institute, his lecture in Reading at 4.30 pm on Monday 21 October in the Mathematics Department, and in London he will lecture at 4.30 pm on Thursday 31 October at Queen Mary, University of London.

For further information please check with the appropriate local organiser: Reading: Professor Wright (j.d.m.wright @reading.ac.uk), London: Professor Chu (maa01chc@gold.ac.uk), Oxford: Professor Batty (charles.batty@st-johns. oxford.ac.uk). The organisers gratefully acknowledge generous support from the LMS under its Scheme 5.

MATHEMATICS AND ITS APPLICATIONS CONFERENCE

Gadjah Mada University in co-operation with SEAMS is organising an international conference on Mathematics and its Applications in Indonesia from 14-17 July 2003. Participants wishing to present a paper should send their extended abstract, of no more than three pages, to the Organising Committee no later that 30 March 2003.

A workshop on Computational Mathematics will precede the conference from 7-11 July 2003. The purpose of this workshop is to show how mathematical software packages like Mathematica, Matlab etc. can be used to enhance the understanding of concepts in different areas of mathematics. Participants of the workshop should have a basic knowledge of Matlab and be able to write simple Matlab programs.

Further information can be found at: http://www.math-ugm.web.id/seams 2003 or contact Dr Lina Aryati (seams 2003@math-ugm.web.id).



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GRESHAM COLLEGE GEOMETRY

Professor Harold Thimbleley, Gresham Professor of Geometry (and other mathematical sciences), will give the following Public Lectures during 2002/3:

- 'Designing microwave cookers' Thursday 24 October
- 'Designing mobile phones' Thursday 28 November 2002
- 'Designing for humans' (with Dr Ann Blandford) Thursday 13 February
- 'Designing anything: from Lego to mathematics' Thursday 13 March
- 'Design by symmetry' Thursday 27 March

All lectures are delivered at 6.00 pm at Gresham College, Barnard's Inn Hall, Holborn, London EC1N 2HH. Admission to the lectures is free and without tickets. Further details can be obtained from Gresham College (tel: 020 7831 0575; fax: 020 7831 5208; e-mail: enquiries@gresham.ac.uk; web: www.gresham.ac.uk).

MAX-ALGEBRA WORKSHOP

An international workshop on max-algebra will be held at the School of Mathematics and Statistics, University of Birmingham from 30 June - 3 July 2003 on the occasion of the 70th birthday of Professor R.A. Cuninghame-Green. All aspects of max-algebra theory and applications are included in the programme.

Among the principal speakers are: M. Akian (Paris), R. Brualdi (Madison), R. Burkard (Graz), G. Cohen (Paris), S. Gaubert (Paris), M. Gondran (Clamart), J. Gunawardena (Harvard), P. Hammer (Rutgers), A. Hoffman (New York), V. Kolokoltsov (Nottingham), G. Litvinov (Moscow), G-J. Olsder (Delft), J-E. Pin (Paris), S. Samborski (Caen), C. Sparrow (Warwick), H. Schneider (Madison), H.P. Williams (London), K. Zimmermann (Prague).

A special issue of *Discrete Applied Mathematics* will be prepared based on refereed conference contributions. The meeting is supported by an LMS conference grant. Financial support for participants from certain countries is available. For further information and on-line registration contact: Peter Butkovic, School of Mathematics and Statistics, University of Birmingham, Edgbaston, Birmingham B15 2TT (tel: 0121 41 6600, fax: 0121 41 43389, e-mail: p.butkovic@bham.ac.uk, web: http://www. mat.bham.ac.uk/P.Butkovic/iwmal/).

ALGEBRAS, MODULES AND RINGS CONFERENCE

An international conference on Algebras, Modules and Rings will be held at the University of Lisbon, Lisbon, Portugal from 14-18 July 2003. The speakers are:

- W.W. Crawley-Boevey (Leeds)
- J.A. de la Pena (UNAM, Mexico City)
- N.V. Dung * (Ohio, Zanesville)
- K. Goodearl * (California, Santa Barbara)
- I. Gordon (Glasgow)
- P.A. Guil Asensio (Murcia)
- O. Iyama (Himeji)
- S.C. Koenig (Leicester)
- L. Levy (Wisconsin, Madison)
- O. Mathieu (Claude Bernard, Lyon)
- J. Okninski (Warsaw)
- B.L. Osofsky (Rutgers, New Brunswick)
- C.M. Ringel (Bielefeld)
- C. Santa-Clara (Lisboa)
- M. Saorín (Murcia)
- A. Tonolo (Padova)
- J. Trlifaj (Karlova, Praha)
- M. Van den Berg (Limburgs, Diepenbeek)

* provisional acceptance

For further information contact the conference organiser (lisboa03@cii.fc.ul.pt) or visit the website (http://caul.cii.fc. ul.pt/lisboa2003/).

INVITATION TO WRITE AN ARTICLE FOR PHIL TRANS A ...

Visions of the Future by Young Scientists

The Philosophical Transactions of the Royal Society (Series A: Mathematical, Physical and Engineering Sciences) is the world's longest running scientific journal. Founded in 1665 it was used by Newton to launch his scientific career. It is published monthly by the Royal Society, the UK academy of science. All issues of the journal since 1665 are archived electronically by JSTOR in USA (www.jstor.org), accessible through most University Libraries.

The three Millennium Issues of Phil Trans A, devoted to the work of young scientists, proved to be highly successful. The collections give a unique snap-shot of the state of physical science at the turn of the millennium, of interest to researchers and the public at large. The excitement and enthusiasm of the young scientists is strongly conveyed. The Editor, Michael Thompson, is now planning a rolling series of triennial Christmas Issues. Following the Millennium pattern, he plans to solicit articles from leading young scientists, including holders of Royal Society Research Fellowships. For compatibility with these awards, young will be interpreted as scientists with no more than ten years' postdoctoral experience. It is expected that Cambridge University Press will be adapting these issues as a series of books, as was the case with the Millennium Issues.

Young researchers, worldwide, are hereby invited to submit articles reviewing their field of work and looking forward to new developments. They are encouraged to be more speculative, and perhaps more provocative, than they would normally be in a review article. The articles should be timely and topical, and written for a general scientific audience, at about the level of *Scientific American*. They should be well illustrated with diagrams, photographs, etc, and detailed mathematics should be kept to a minimum. A paper that describes some recent cutting edge research, as well as putting it in its wider context, and looking forward to the future is an ideal candidate. The papers will be subjected to a refereeing process which takes account of the above criteria.

For this new series the editor is adopting the pattern of publishing one issue each Christmas, rolling cyclically through the physical sciences as follows:

2002 and 2005 to cover Astronomy & Earth Science 2003 and 2006 to cover

Mathematics, Physics & Engineering 2004 and 2007 to cover Chemistry & Life Science

In view of the interdisciplinary nature of much research, this classification will be applied in a flexible manner, and researchers in the biological sciences should not necessarily be deterred. Suggestions for contributions are now welcomed, according to the following timetable.

15 October 2002

Receipt of abstracts by Editor 30 October 2002

Acceptance decisions to authors

1 February 2003

Receipt of papers by the Editor February-May 2003

Refereeing process

15 June 2003

Receipt of final, refereed papers

Any young scientist, worldwide, who would be interested in contributing an article should send an abstract to the Editor for consideration: submissions by email are strongly encouraged. The abstract should be about one page in length, and a brief CV should also be attached.

Editor Professor J.M.T. Thompson, FRS, Editor, Philosophical Transactions A, Centre for Nonlinear Dynamics, Civil Engineering Building, University College London, Gower Street, London WC1E 6BT (e-mail: jmtt@ucl.ac.uk, web: www.ucl. ac.uk/~ucess21).



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ICIAM 2003 is organised by ANZIAM (Australian and New Zealand Industrial and Applied Mathematics) for the International Council for Industrial and Applied Mathematics

www.iciam.org

submit abstracts at



ICMS WORKSHOP

SDEs and SPDEs : Numerical Methods and Applications

Edinburgh, 31 March to 4 April 2003

The meeting will focus on recent advances in Stochastic (Partial) Differential Equations, especially numerical methods and applications. The Workshop is supported by the Engineering and Physical Sciences Research Council.

Scientific Committee

Kevin Burrage (Queensland) Charles Doering (Michigan) Des Higham (Strathclyde) Peter Kloeden (Frankfurt) Rachel Kuske (Minnesota) Katja Lindenberg (San Diego) Andrew Stuart (Warwick)

Organising Committee

Gabriel Lord (Heriot-Watt) Grant Lythe (Leeds) Tony Shardlow (Manchester)

The following have provisionally agreed to speak:

Chris Van den Broeck (Limburg) Pamela Burrage (Queensland) Hans Crauel (Ilmenau) Arnaud Debussche (ENS-Cachan) Jean-Pierre Fouque(NCSU) Jordi Garcia-Ojalvo (Catalunya) Istvan Gyöngy (Edinburgh) Kalvis Jansens (UCL) Andre Longtin (Ottawa) Jon Mattingly (Stanford) Alan McKane(Manchester) James Robinson (Warwick) Angel Sanchez (Madrid) Jose Maria Sancho (Barcelona) Christoph Schwab (ETHZ) David Silvester (UMIST) Ronnie Sircar (Princeton) Michael Tretiakov (Leicester) Eric Vanden-Eijnden (NYU)

Anyone interested in attending should complete the online application form (accessed via the meeting home page). Contributed talks are invited, although the number of slots available will be very limited. Limited financial support (covering a portion of the local Workshop costs) may be also be applied for.

The meeting webpages contain detailed information:

http://www.ma.hw.ac.uk/icms/meetings/2003/sde/index.html

THE INTERNATIONAL CENTRE FOR MATHEMATICAL SCIENCES 14 India Street, Edinburgh EH3 6EZ tel: +44 (0)131 220 1777; fax: +44 (0)131 220 1053; email: icms@maths.ed.ac.uk

MATHEMATICAL THEORY OF HYPERBOLIC SYSTEMS OF CONSERVATION LAWS (24 - 28 March 2003)

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MULTIPHASE FLUID FLOWS AND MULTI-DIMENSIONAL HYPERBOLIC PROBLEMS (31 March - 4 April 2003)

in association with the Newton Institute programme entitled Nonlinear Hyperbolic Waves in Phase Dynamics and Astrophysics (27 January - 11 July 2003)

Organisers: J. Ballmann (Aachen, Germany), C.M. Dafermos (Providence, USA), P.G. LeFloch (Palaiseau, France), R. LeVeque (Seattle, USA), E.F. Toro (Trento, Italy)

Main Topics of week one: Nonlinear hyperbolic systems of conservation laws govern a broad spectrum of physical phenomena, in compressible fluid dynamics, nonlinear material science, etc. Such equations admit solutions that may exhibit shock waves and other nonlinear waves (propagating phase boundaries, fluid interfaces, etc) which play a dominant role in multiple areas of physics. Recent developments on the theory of one-dimensional systems will be covered, including: entropy conditions, L1 well-posedness, singular limits, diffusive approximations, relaxation models, kinetic relations, shock wave structure, links with thermodynamics, etc.

Main Topics of week two: This second week will focus on multidimensional aspects of hyperbolic conservation laws and on computational methods with applications to multiphase flows. A partial list of topics includes: existence theory for multidimensional hyperbolic equations, transonic flow models, mathematical modeling of liquid-vapor flows, numerical schemes for multiphase flows, nonconservative hyperbolic systems, real fluids, material interfaces, etc.

Partial list of invited speakers:

B. Keyfitz (Houston) P.D. Lax (New York) P.G. LeFloch (Palaiseau) T-P. Liu (Taipei & Stanford) P. Marcati (L'Aquila) R. Menikoff (Los Alamos) C.S. Morawetz (New York) R. Natalini (Rome) N. Nikiforakis (Cambridge) B. Perthame (Paris)
P.L. Roe (Ann Arbor)
D. Serre (Lyon)
M. Slemrod (Madison)
E. Tadmor (Washington)
E.F. Toro (Trento)
K. Trivisa (Washington)
A. Tzavaras (Madison)
Z. Xin (Hong Kong)

Poster Session: There will be an opportunity for individuals interested in participating in the scheduled Poster Session, please indicate on the online application form if you wish to take part. A short abstract together with a title will be required. Note that a limited number of posters only can be accepted.

Location and cost: The conference will take place at the Newton Institute and accommodation for participants will be provided in single study bedrooms with shared bathroom at Wolfson Court. The workshop package, costing £360 per week or £780 for two weeks, includes accommodation, breakfast and dinner from dinner on Sunday 23 March 2003 until breakfast on Saturday 5 April 2003, and lunch and refreshments during the days that lectures take place.

Further information and applications forms are available from the web (http://www.newton.cam.ac.uk/programmes/NPA/npaw01.html). Completed application forms should be e-mailed to Tracey Andrew at the Isaac Newton Institute, 20 Clarkson Road, Cambridge CB3 0EH, or via e-mail (t.andrew@newton.cam.ac.uk). Closing date for the receipt of applications is **29 November 2002**.

EUROCONFERENCE HYPERBOLIC MODELS IN ASTROPHYSICS AND COSMOLOGY

(23 - 27 June 2003)

in association with the Newton Institute programme entitled Nonlinear Hyperbolic Waves in Phase Dynamics and Astrophysics (27 January - 11 July 2003)

Supported by the European Commission, Research DG, Human Potential Programme, High Level Scientific Conference. Contract number HPCF-CT-2002-00106

Organisers: C.M. Dafermos (Providence, USA), P.G. LeFloch (Palaiseau, France), J. Smoller (Ann Arbor, USA), and J.M. Stewart (Cambridge, UK).

Theme of the EuroConference: Hyperbolic problems in Astrophysics and Cosmology (relativistic compressible fluid models, the Einstein Field equations of General Relativity) are particularly challenging for the applied mathematician. They are essential in order to uncover the structure and formation of the Universe. Main topics: general relativity, linear and nonlinear hyperbolic equations, Riemann solvers, well-posedness theory for the Einstein equations, black hole geometries, interaction of gravity with other force fields, etc.

Partial list of invited speakers:

C. Bona Garcia (Palma de Mallorca, Spain) *D. Christodoulou (Zürich, Switzerland) A. Dafermos (Cambridge, USA) H. Friedrich (Golm, Germany) J.A. Font (Burjassot, Spain) *S. Klainerman (Princeton, USA) S. Komissarov (Leeds, UK) A. Linden (Bloomington, USA) M.A.H. MacCallum (London, UK) L.J. Mason (Oxford, UK) A. Rendall (Golm, Germany) O. Reula (Cordoba, Argentina) *E. Seidel (Golm, Germany) J. Smoller (Ann Arbor, USA) J.M. Stewart (Cambridge, UK) B. Temple (Davis, USA) G. Weinstein (Birmingham, USA)

* to be confirmed

Poster Session: There will be an opportunity for interested individuals to participate in the scheduled Poster Session; please indicate on the online application form if you wish to take part. A short abstract together with a title will be required. Note that a limited number of posters only can be accepted.

Location and Cost: The EuroConference will take place at the Newton Institute and accommodation for participants will be provided in single study bedrooms with shared bathroom at Wolfson Court. The workshop package, costing £360, includes accommodation, breakfast and dinner from dinner on Sunday 22 June 2003 until breakfast on Saturday 28 June 2003, and lunch and refreshments during the days that lectures take place.

Further information and applications forms are available from the web (http://www.newton.cam.ac.uk/programmes/NPA/npaw03.html). Completed application forms should be e-mailed to Tracey Andrew at the Isaac Newton Institute, 20 Clarkson Road, Cambridge CB3 0EH, or via e-mail (t.andrew@newton.cam.ac.uk). Closing date for the receipt of applications is **31 December 2002**.

THE INSTITUTE OF MATHEMATICS AND ITS APPLICATIONS



FORTHCOMING CONFERENCES

Mathematics in Communications

Actuarial Valuations, Accounting Standards and Financial Economics

Mathematical Education of Engineers IV

Vision, Video and Graphics

Bifurcations: The Use and Control of Chaos

Quantitative Modelling in the Management of Healthcare IV

Imaging and Digital Image Processing IV

Mathematics of Surfaces X

Fractal Geometry II

Cryptography and Coding IX

Modelling Permeable Rocks IV

Lancaster University, 16-18 December 2002 Royal Society, London, 13 February 2003

University of Loughborough, 1-3 April 2003

University of Bath, 10-11 July 2003

University of Southampton, 28-30 July 2003

University of Salford, 3-5 September 2003

University of Leicester, 9-12 September 2003

University of Leeds, 15-17 September 2003

University of Leicester, 16-19 September 2003

Royal Agricultural College, Cirencester, 16 - 18 December 2003

University of Southampton, 30 March-1 April 2004

CO-SPONSORED CONFERENCES

Second International Conference on Pedestrian and Evacuation Dynamics (PED) 20 - 22 August 2003

University of Greenwich,

6th Hellenic European Research Conference Athens, Greece, on Computer Mathematics and its Applications - HERCMA 2003

15 - 27 September 2003

For further details of all these conferences visit our website on www.ima.org.uk or contact: Conference Office, The Institute of Mathematics and its Applications, Catherine Richards House, 16 Nelson Street, Southend-on-Sea, Essex SS1 1EF.

Direct line: (01702) 356113 Email: conferences@ima.org.uk

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C. SYNGE MORAWETZ HONORARY MEMBER 2001

DIARY

The diary lists Society meetings and other events publicized in the Newsletter. Further information can be obtained from the appropriate LMS Newsletter whose number is given in brackets. A fuller list of meetings and events is given in the Society's web site (http://www.lms.ac.uk/meetings/diary.html). **OCTOBER 2002** Stirling University (308) 7 Multiscale Phenomena in Plasticity, Warwick 28 LMS Mary Cartwright Lecture, Edinburgh University (307) **MARCH 2003** 10-13 Third International Conference on Applied 7 Edinburgh Mathematical Society Meeting. Mathematics, Romania (307) Abertay University of Dundee (308) 18 Patterns, Nonlinear Dynamics and Applications 11 LMS Northern Regional Meeting, Manchester Meeting, DAMTP, Cambridge University (308) University 18 Edinburgh Mathematical Society Meeting & 31-4 Apr SDEs and SPDEs: Numerical Methods and AGM, Edinburgh University (308) Applications ICMS Workshop, Edinburgh (308) 23 BSHM/LMS Meeting, The Four-colour Problem, APRIL 2003 London (308) 7-10 BMC 2003, Birmingham University (296) **NOVEMBER 2002** 7-10 BAMC 2003, Southampton University (296) 1-2 North British Functional Analysis Seminar, 7-12 Holomorphic Dynamics Workshop, Warwick Glasgow University (308) University (308) MAY 2003 4-6 Fourth De Morgan Conference: Combining Probability and Logic, King's College, London (307) 2 Edinburgh Mathematical Society Meeting, 15 LMS Meeting/Oxford Colloquia, Oxford Edinburgh University (308) University (308) 14 LMS Midlands Regional Meeting, Coventry 15 Edinburgh Mathematical Society Meeting, University Strathclyde University (308) 30 Edinburgh Mathematical Society Meeting, 16 Functional Analysis Conference, Queen's Aberdeen University (308) University Belfast (305) **JUNE 2003** 22 LMS Annual General Meeting, London (308) 23-27 Hyperbolic Models in Astrophysics & 22-25 Workshop on Contemporary Aspects of Cosmology EuroConference, INI, Cambridge (308) Mathematical Physics, Gregynog Hall (308) 30-3 Jul Max-Algebra International Workshop, 25 LMS South West and South Wales Regional Birmingham University (308) Meeting, Gregynog Hall (308) **JULY 2003** 27-29 Semigroups and Languages Workshop, 7-11 ICIAM 2003, Sydney, Australia (308) Lisbon, Portugal (307) 7-11 International Mathematica Symposium, **DECEMBER 2002** Imperial College London (307) 6 Edinburgh Mathematical Society Meeting, Napier 7-11 Computational Mathematics Workshop, University (308) Indonesia (308) 9-13 Elliptic Cohomology & Chromatic Phenomena 7-18 Symbolic Dynamics & Ergodic Theory EuroWorkshop, INI, Cambridge (305) Workshop, Warwick University (308) 9-13 Real and Complex One-dimensional Dynamics 14-17 Mathematics and its Applications Workshop, Warwick University (308) International Conference, Indonesia (308) 14-18 Algebras, Modules and Rings International 16-12 Higher Chromatic Phenomena EuroWorkshop, INI, Cambridge (305) Conference, Lisbon, Portugal (308) 21-25 Geometric Aspects of Dynamical Systems 17 Recent Advances in Probability and Statistics Workshop, Brunel University of West London (306) Workshop, Warwick University (308) **JANUARY 2003** 27-9 Aug Banach Algebras & their Applications 17 Edinburgh Mathematical Society Meeting. Conference, Edmonton, Alberta (302) Edinburgh University (308) AUGUST 2003 20-24 Mathematical Challenges in Scientific & 28-5 Sept New Horizons in Arithmetic Geometry, Engineering Computation, INI, Cambridge (306) Durham University (307) FEBRUARY 2003 **JULY 2004** 10-14 Permutation Patterns Conference, Otago 4-11 ICME10 - International Congress of University, New Zealand (303) Mathematical Education, Denmark (308) 13-14 Computational Challenges in Micromagnetics SEPTEMBER 2004 & Superconductivity, INI, Cambridge (306) 1-6 Pan-African Congress of Mathematicians, 14 Edinburgh Mathematical Society Meeting, Tunisia (308)

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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