LMS NEWSLETTER

No. 83 *November 1981*

DATES OF SOCIETY MEETINGS

Friday, 20 November 1981, Burlington House (AGM; T. Brooke-Benjamin and J. B. Paris).

Friday, 15 January 1982, Burlington House (N. L. Biggs and D. Williams).

Friday, 19 February 1982, Burlington House (J. T. Stafford and I. N. Herstein).

Friday, 19 March 1982, Burlington House (S. Sternberg and E. C. Zeeman).

Friday, 16 April–Saturday, 17 April 1982. Two-day meeting at Oxford.

Friday, 14 May–Saturday, 15 May 1982. Two-day meeting at Sheffield.

Friday, 21 May–Monday, 24 May 1982. Weekend meeting at Gregynog.

Friday, 18 June 1982, Burlington House (P. J. Cameron and R. Bieri).

Although the Society usually meets on the third Friday of the month, the ordinary meeting in May 1982 is that in Sheffield, as the Gregynog meeting is more specialized.

R. A. Bailey

ANNUAL GENERAL MEETING

The Annual General Meeting of the London Mathematical Society will be held on Friday 20 November 1981 at 3 p.m. in Burlington House, Piccadilly, London W1V 0NL.

The report of the treasurer will be read.

The meeting is empowered by Article 18 of the Statutes of the Society and by By-Law I, 10 of the By-Laws of the Society to elect between 16 and 20 members to form a Council and officers for the ensuing year, this number to include any members of Council whose terms of office under By-Law I, 11 have not expired. The meeting will also appoint auditors.

A list of those members who have been recommended by the present Council (acting under this Article and under By-Laws 1 2, 3, 4, 6 and 11) for election as the Council and officers for the upcoming year appears on the ballot paper. Under By-Law I, 7 you have power to add any eligible names which are not already contained in that list. Such names as you do not vote for should then be struck off until the whole number, including the officers, is reduced to 14 at most. However the list must contain at least two names of members not on the Council during the present session. The officers must consist of a president, vice-president(s), treasurer, librarian and secretaries.

Note that six members-at-large of the Council for 1980–81 have terms of office which do not expire until 1982; these are A. W. Goldie, K. W. Gruenberg, W. K. Hayman, J. M. Howie, I. G. Macdonald and G. E. H. Reuter. Hence they are automatically members of the Council for 1981–82, it is suggested that you bear this in mind when casting your ballot.

If you do not attend the meeting your vote will be counted if your list, duly signed and addressed to "The Scrutineers, London Mathematical Society, Burlington House, Piccadilly, London W1V 0NL" is received at least 36 hours before the time of the meeting.

P. R. Goodey

UNIVERSITY MATHEMATICS TEACHING CONFERENCE 1981

The conference will be held in Nottingham, running from Tuesday, 15 December to Friday, 18 December. The work of the conference will be centred around two main themes and be carried out as in previous years on the basis of working groups. Each group will work on one of the themes and produce a report on the basis of an initial brief. Plenary sessions will also be held on topics of common interest.

The principal theme this year will be "Development of skills required by mathematics graduates". Employers of mathematics graduates generally say they are searching for certain skills, e.g. ability to communicate in writing and in speech, ability to work with others, ability to solve new problems, etc. and yet these skills are rarely among the goals of undergraduate mathematics teaching. What skills of this sort are desirable? How can we teach or develop them in our undergraduates? How will this affect our course?

The second theme of the conference is

"Post-experience education in mathematics". With the increasing role of mathematics in many industries and the future decline in undergraduate numbers, the development of post-experience courses is likely to become an increasingly important feature for university mathematics teaching. The courses may vary in duration from full-time (for those making a second career) to part-time (e.g. one day per week) to short courses of a few weeks. The level may vary from degree level to professional level to state of the art level. The latter two levels in particular are little cared for in the UK. Should universities become involved with post-experience education? How should mathematics be involved?

In addition there will be plenary sessions, which will include a discussion on the Cockcroft Report due out soon, and further opportunity will be given to consider the use of video in undergraduate teaching.

Heads of UK Mathematics Departments are being asked to nominate representatives. Further information may be obtained from Judith Rowlands, Shell Centre for Mathematical Education, University of Nottingham, Nottingham NG7 2RD.

SYSTEMS OF NONLINEAR PDE's

A joint NATO/London Mathematical Society Advanced Study Institute on "Systems of Nonlinear Partial Differential Equations" will be held in Oxford, UK, 25 July to 7 August 1982.

Topics: Systems of nonlinear partial differential equations, especially those arising in applied science. The institute will concentrate on techniques and phenomena peculiar to systems of more than one equation.

Programme: Expository series of lectures on Techniques and fundamental theory, Analytical problems from continuum mechanics, Elliptic systems and the calculus of variations, Hyperbolic and parabolic systems, Geometric methods. Special working sessions on Analysis and computational fluid dynamics, Dynamical systems and partial differential equations, Nonelliptic problems and phase transitions, Problems in nonlinear elasticity, Applications of bifurcation theory to mechanics.

Speakers: S. S. Antman (Maryland), T. B. Benjamin (Oxford), A. J. Chorin (Berkeley), C. M. Dafermos (Brown), J. L. Ericksen (Johns Hopkins), L. C. Evans (Maryland), M. Giaquinta (Firenze), E. Giusti (Pisa), J. K. Hale (Brown), S. Hildebrandt (Bonn), J. B. Keller (Stanford), J. E. Marsden (Berkeley), L. Nirenberg (New York), D. G. Schaeffer (Duke), J. A. Smoller (Michigan), L. Tartar (Orsay).

Participation is limited and by inviation of the organizing committee only. Those desiring invitations or further information should write to the Director: J. M. Ball, Department of Mathematics, Heriot-Watt University, Riccarton, Currie, Edinburgh EH14 4AS, Scotland, UK. The deadline for applications is end of February 1982. Some financial support is available for all participants.

J. M. Ball

VISITORS TO IHES

The following mathematicians are expected to visit the Institut des Hautes Etudes Scientifiques for the academic year 1981–82.

Baker, M.	MIT	Im Hof, H.	Bonn
Bierstone, E.	Toronto	Kurata, M.	Nagoya
Eastwood, M.	Oxford	Lebrun, C.	SUNY
Ekedahl, T.	Göteborg	Mandouvalos, N.	Cambridge
Henc, D.	Zagreb		

The following will be visiting for the stated period during the autumn of 1981.

Name	*Institution*	*Period*
Miwa, T.	Kyoto	16 October–2 November 1981
Piatetski-Shapiro, A.	Tel Aviv/Yale	7 September–31 December 1981
Rees, M.	Minnesota	13 August–31 March 1982
Schwarz, G.	Brandeis	15 September–31 March 1982
Seade, J.	Mexico	19 September–20 December 1981
Seligman, G.	Yale	2 October–31 December 1981
Shikata, Y.	Nagoya	1 December–30 June 1982
Smith, L.	Göttingen	7 September–28 February 1982
Tamura, I.	Tokyo	November 1981
Tukia, P.	Helsinki	11 October–28 November 1981
Valette, A.	Brussels	5 September–31 January 1982

ICPAM 1982 PROGRAMME

The International Centre for Pure and Applied Mathematics (ICPAM) established in Nice as set up by the 18th General Conference of the UNESCO has the following functions: further training of mathematicians with priority given to people coming from developing countries; the selection, printing and distribution of mathematical notes.

The Centre has an interdisciplinary vocation, specifically the study of mathematics and its application to concrete problems, notably those related to development. The Centre is sponsored by UNESCO.

The programme for 1982 is given below. Further information should be obtained from CIMPA/ICPAM, 1 Avenue Edith-Cavell, 06000 Nice, France.

SPRING SCHOOL 1982: Singular integrals and potential theory in non-smooth domains.

Course contents: Classical potential theory, Perron's method, harmonic measures, boundary behaviour and Dirichlet problems in Lipschitz domains.

Double and single layer potentials and an introduction to euclidean singular integrals (Hilbert transform, odd kernels), maximal functions and area functions, weighted L^p inequalities, Cauchy-Calderon singular integrals on Lipschitz curves, application to Dirichlet and Neuman problems in C^1 domains.

In addition, an informal seminar will allow the lecturers and the participants themselves to review more classical material on harmonic functions and Fourier analysis and to present their own research interests.

Date and location: 5 May to 16 June 1982 at Nice, France.

Applicants should send to the ICPAM office before 1 January 1982 their curriculum vitae together with two recommendation letters and a description of the financial arrangements for travel, lodging and registration fees. All applicants will be informed of the result of their application in February 1982.

SUMMER SCHOOL 1982: Numerical treatment of elliptic problems with singularities.

Course contents: Formulation of elliptic problems, sources of singularities, physical and technical examples, applications in fracture mechanics, etc.

Structure of the singularities, some introduction to Sobolev spaces.

Basic principles of variational approach.

Basic finite element method: the "h-version" (classical) and "p-version"; examples of technical problems; short survey of today's software.

Problems with singularities; numerical behaviour and difficulties.

Some special treatments and their assessment.

A-posteriori estimates and adaptive approaches.

Reduced intergation techniques and related problems in the treatment of elasticity problems.

Date and location: 23 June to 13 July 1982 at Nice, France.

Applicants should send to the ICPAM office before 1 March 1982 their curriculum vitae together with two recommendation letters and a description of the financial arrangements for travel, lodging and registration fees. All applicants will be informed of the result of their application in April 1982.

AUTUMN SCHOOL I 1982: Elementary algebraic geometry.

Course contents: Affine varieties, projective varieties; linear systems; projective embedings; coherent sheaves; cohomology, Serre duality; algebraic curves; Riemann-Roch formula; Clifford theorem.

Spaces curves, curves on quadric and cubic surfaces; the state of Halphen's conjecture.

Vector bundles and reflexive sheaves over projective spaces.

Date and location: 26 August to 16 September 1982 at Nice, France.

Applicants should send to the ICPAM office before 1 March 1982 their curriculum vitae together with two recommendation letters and a description of the financial arrangements for travel, lodging and registration fees. All applicants will be informed of the result of their application in April 1982.

AUTUMN SCHOOL II 1982: Introduction to operational research.

Course contents: Linear programming; Nonlinear programming; Networks, graph theory; Combinatorial optimization; Simulation.

Date and location: 31 August to 17 September 1982 at Nice, France.

Applicants should send to the ICPAM office before 1 March 1982 their curriculum vitae together with two recommendation letters and a description of the financial arrangements for travel, lodging and registration fees. All applicants will be informed of the result of their application in April 1982.

VISITING MATHEMATICIANS

This is the first list for the academic year 1981–82. Further lists will appear in due course.

Name	*Home University*	*Visiting*	*Dates of Visit*
Billington, E. A.	Queensland	RHC	April–July 1982
Blair, D.	Michigan	Liverpool	
Booth, P.	Newfoundland	Oxford	Aug. 1981–July 1982
Code, M.	Guelph	Oxford	Aug. 1981–Aug. 1982
Curran, M. J.	Otago	Oxford	Jan.–July 1982
Daigneault, A.	Montreal	Oxford	April–June 1982
Dejter, H. J.	Brazil	Oxford	Oct. 1981–Sept. 1982
Dror, E.	Jerusalem	Oxford	Aug.–Dec. 1981
Facchini, A.	Padova	Sheffield	Oct. 1981–July 1982
Foulds, L. R.	Canterbury, N.Z.	RHC	April 1982–Feb. 1983
Gilbert, R. P.	Delaware	Oxford	Sept. 1981–Aug. 1982
Goldsmith, B.	Dublin	Oxford	Oct. 1981
Gregus, M.	Kohenskeho	Oxford	Oct.–Dec. 1981
Görsoy, O.	Turkey	Oxford	Oct. 1981–July 1982
Hill, R.	Michigan	Oxford	Sept. 1981–Aug. 1982
Johnson, K. W.	Jamaica	Oxford	Oct. 1981–Sept. 1982
Källen, A.	Lund	Oxford	Jan.–Sept. 1982
Kaplen, A.	Massachusetts	Oxford	3–5 months 1981–82
Laska, M.	Bielefeld	Oxford	Oct. 1981–Sept. 1982
Liddell, G. F.	Otago	Oxford	June–Nov. 1982
Lun, W. C.	Hong Kong	Oxford	Jan.–Oct. 1982
Matravers, D. R.	Capetown	Oxford	July 1981–June 1982
Oka, S.	Kyushu	Oxford	Oct. 1981–July 1982
Okcay, A.	Istanbul	Liverpool	Oct. 1981–Sept. 1982
Pearle, P.	NY	Oxford	Sept. 1981–July 1982
Pugh, C.	Berkeley	Oxford	Oct. 1981–July 1982
Scheerer, H.	Berlin	Oxford	Jan.–June 1982
Shirafugji, T.	Japan	Oxford	Sept. 1981–June 1982
Soucek, V.	Prague	Oxford	Oct. 1981–Feb. 1982
Swarup, S.	India	Oxford	Oct. 1981–July 1982
Terrier, J. M.	Montreal	Oxford	Oct.–Nov. 1981
Weintraub, S.	Louisiana	Oxford	Jan.–June 1982
Wojtkowiek, Z.	Warsaw	Oxford	Oct. 1981–Sept. 1982
Keady, G.	Australia	Oxford	April–Oct. 1982
Segel, L. A.	Israel	Oxford	April–May 1982
Solomon, R. M.	Ohio	Oxford	March–Dec. 1982
Winfree, A. T.	Purdue	Oxford	April–June 1982

WHITHER MATHEMATICS?

At the request of the Editor of the Newsletter, *Professor D. S. Jones has supplied the following notes on his report.*

In *Whither Mathematics?*, after an examination of various factors, it is suggested that the number of university entrants in the mathematical sciences can be regarded as being some 11·2% of those passing A-level mathematics. If it is assumed that this will also hold in the future then it is possible to predict the number of entrants in the 1990s provided that an estimate of how many will pass A-level is available. During the past decade this has fluctuated about 3·5% of the 18-year-old population so one method of projection is to use 3·5% of the 18-year-old age group for prediction. However, the percentage showed a tendency to increase in the year or two before 1980 (the numbers of university entrants grew correspondingly, nearly all of the extra students opting for computer science) and so the figure of 4% attained in 1979 might give a more reliable indication of the switch towards science apparently occurring in schools.

Calculations based on either 3·5% or 5% predict an entry to the mathematical (and hard) sciences a decade from now which is undesirably low. Measures which might improve the numbers being taught mathematics are discussed in *Whither Mathematics?*. Should the numbers not be better than predicted, as could be the case if the ameliorative measures fail or are not undertaken, it could be that some Honours

schools would be no longer viable and there would have to be substantial reductions in staff from which the 35–45 age group, being such a high proportion of university staff, could not escape. These observations do not take account of the government cuts for 1983, which were announced after the preparation of the report.

The model employed is crude, but perhaps no more so than others when there are many imponderable forces at work, and the predictions might be offset by significant changes in some factors. The most effective would be for the percentage passing A-level to rise and be sustained at 5% or better, though there is no hard evidence for such a high figure yet. Some would argue that social factors will have a profound effect through different birth rates for different social groups, but not everyone agrees with the interpreation of this data, apart from the question of the stability of social categorisation in the years to come. No doubt a more sophisticated and reliable model would be valuable, but, unless a better manpower model can be constructed the consequences of the demographic trends as predicted by simple analysis are sufficiently alarming for those responsible for policy to be alerted to the need for protective action if the scientific future of this country is to be preserved.

D. S. Jones

SERC GRANTS AWARDED

The Mathematics Committee of SERC has recently made the following Research Grants.

J. T. Stuart and P. Hall (Imperial College): Imperfect bifurcations in hydrodynamic stability.

R. F. Streater (Bedford College): VF for M. J. Westwater.

I. C. Percival (Queen Mary College): Bounds for invariant tori of Lagrangian dynamics.

T. J. Willmore and N. J. Hitchin (Durham): Global Riemannian geometry.

H. P. Williams and K. I. M. McKinnon (Edinburgh): Survey and development of crashing procedures for mathematical programming.

N. K. N. Nichols and L. R. Fletcher (Reading): Numerical methods for eigen value assignment with applications in control systems design.

P. Holgate (Birkbeck): Population algebras.

W. N. Everitt (Dundee): Symposium on ordinary differential equations and operators.

R. Brown (Univ. Coll. North Wales): VF for M. Dyer.

N. O. Weiss, D. P. McKenzie and D. R. Morre (Cambridge): Numerical investigation of three dimensional convection.

R. K. Bullough (Manchester): VF for A. B. Shabat.

D. E. Edmunds (Sussex): VF for H. Triebel.

A. R. Mitchell (Dundee): VF for J. L. I. Morris.

B. Straughan (Glasgow): VF for G. P. Galdi.

J. Norbury and T. Brooke Benjamin (Oxford): VF for G. Keady.

J. Duncan (Stirling): VF for B. H. Aupetit.

S. S. Wainer (Leeds): VF for C. G. Jockusch.

C. P. Rourke (Warwick): VF for D. A. Stone.

D. E. Edmunds (Sussex): VF for A. Kufner: Function spaces and partial differential equations.

I. M. James (Oxford): VF for C. C. Pugh.

J. A. Green (Warwick): VF for J. N. Spaltenstein.

I. M. James (Oxford): VF for S. H. Weintraub.

K. W. Morton (Reading): VF for S. J. Osher.

M. R. C. McDowell (RHC): VF for L. R. Foulds.

N. J. Young (Glasgow): VF for H. Radjavi.

G. L. Sewell (Queen Mary): Mathematical foundations of non-equilibrium quantum statistical mechanics.

H. N. V. Temperley (Swansea): Study of percolation and colouring problems on periodic lattices.

J. G. Taylor and P. C. West (King's): Extended supergravity and its quantum field theoretic properties.

J. R. Willis (Bath): Wave propagation in composites.

A. R. Camina (East Anglia): Primitive permutation groups acting on designs.

APPLICATIONS OF COMBINATORICS

A one-day conference on Applications of Combinatorics will be held at the Open University on Friday, 13 November, beginning at 10.30 a.m. The speakers will include: R. A. Bailey (Rothamsted), C. Butler and L. R. Mathews (BR), A. D. Cliff (Cambridge), N. Christofides (IC), K. W. Cattermole (Essex), J. H. van Lint (Eindhoven), R. B. Mallion (Canterbury), L. March (London), D. J. A. Welsh (Oxford). Further information may be obtained from Dr. R. J. Wilson, Faculty of Mathematics, Open University, Milton Keynes MK7 6AA.

BOOKS RECEIVED FOR REVIEW IN THE *BULLETIN*

Complimentary copies of the books listed below have been received from their publishers by the Society. Those for which the *Bulletin* is unable to publish a review will be lodged in the Society's Library at University College, London, where they are available for inspection and use by members.

K. G. Binmore: Foundations of analysis: A straightforward introduction—Book 2—Topological ideas, pp 249, £15 h/b, £6·95 p/b (Cambridge University Press).

W. G. McKay, J. Patera: Tables of dimensions, indices and branching rules for representation of simple lie algebras, pp 315, SFr 90 (Marcel Dekker Inc.).

I. Stewart, J. Jaworski (eds): Seven years of manifold 1968–1980, pp 100, £5 (Shiva).

P. Sprent: Quick statistics, An introduction to non-parametric methods, pp 262, £3·95 (Penguin).

T. A. Springer: Linear algebraic groups, pp 304, SFr 38 (Birkhauser Verlag).

M. P. Malliavin, A. Warusfel: Algèbre linéaire et géométrie classique, pp 128, FFr 51·50 (Editions Masson).

M. J. D. Powell: Approximation theory and methods, pp 339, £25 h/b, £8·50 p/b (Cambridge University Press).

R. B. Cooper: Queuing theory, pp 347, £14 (Edward Arnold). (2nd edition).

R. L. Graham: Rudiments of Ramsey Theory, pp 65 (American Mathematical Society).

J. Coates, S. Helgason (eds): Séminaire de théorie des nombres, Paris 1979–80, pp 394, SFr 44 (Birkhauser Verlag).

P. J. Kamthan, M. Gupta: Sequence spaces and series, pp 384, SFr 120 (Marcel Dekker Inc.).

I. N. Stewart: Concepts of modern mathematics, pp 339, £3·50 (Penguin).

B. S. Everitt, D. J. Hand: Finite mixture distributions, pp 143, £7·50 (Chapman & Hall).

C. Plumpton, M. S. Macilwaine: New tertiary mathematics, Vol. 2, Pt. 2. Further Applied Mathematics, pp 452, $16·75 (Pergamon).

W. L. Voxman, P. H. Goetschel, Jr.: Advanced calculus: An introduction to modern analysis, pp 608, SFr 135 (Marcel Dekker Inc.).

B. Kolman: Calculus: For the management, life, and social sciences, pp 514, $19·95 (Academic Press, NY).

D. N. Burghes, M. S. Barrie: Modelling with differential equations, pp 172, £12·50 (John Wiley & Sons), £4·95, $12·40 p/b (Ellis Harwood).

A. Hald: Statistical theory of sampling inspections by attribute, pp 515, £35, US $85 (Academic Press).

C-C Hsiung: A first course in differential geometry, pp 343, £19·05 (John Wiley).

V. I. Istratescu: Introduction to linear operator theory, pp 600, SFr 88 (Pure & Applied Maths, Vol. 65) (Marcel Dekker Inc.).

L. Schumaker: Spline functions: Basic theory, pp 553, £27·05 (John Wiley).

D. F. Wright, B. D. New: Introductory algebra, pp 366, £16·95 (Allyn & Bacon Inc.).

D. F. Wright, B. D. New: Intermediate algebra, pp 494, £16·95 (Allyn & Bacon Inc.).

S. Vajda: Linear programming, pp 150, £4·50 p/b (Chapman & Hall).

I. Kra, B. Maskit (eds): Reimann surfaces and related topics: Proceedings of the 1978 Stony Brook conference, pp 517, £14·60 h/b, £5·55 p/b (Princeton University Press).

S. K. Gupta, M. P. Murthy: Suslin's work on linear groups over polynomial rings and Serre problem, pp 113, Rs 32 (Macmillan, India).

C-L Hwang, K. Yoon: Multiple attribute decision making: methods and applications, pp 259, DM 40, US $21 (Lecture Notes in Economic & Mathematical Statistics, Vol. 186) (Springer Verlag).

E. J. Watson: Laplace transforms and applications, pp 205, £8·50 (Van Nostrand Reinhold).

Edited by N. L. Biggs, Department of Mathematics, Royal Holloway College, Egham, Surrey TW20 0EX.
Printed by C. F. Hodgson & Son Ltd., 50 Holloway Road, London N7 8JL.

University of Petroleum & Minerals
Dhahran, Saudi Arabia

The Department of Mathematical Sciences will have faculty positions open for the academic year 1982-83, starting 1 September 1982 in the following areas:

Applied Mathematics
Analysis
Differential Equations
Geometry
Topology
Numerical Analysis
Statistics

Academic Qualifications and Experience:

PhD Degree in any of the fields mentioned above or a master's degree in Mathematics plus teaching and research interests.

Language of instruction is English.

Minimum regular contract for two years, renewable. Competitive salaries and allowances. Air conditioned and furnished housing provided. Free air transportation to and from Dhahran each year. Attractive educational assistance grants for school-age dependant children. All earned income without Saudi taxes. Ten months duty each year with two months vacation with salary. There is also possibility of selection for University's ongoing summer programme with good additional compensation.

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