

LONDON MATHEMATICAL SOCIETY

NEWSLETTER

No. 429 October 2013

Society Meetings and Events

2013

Thursday 31 October Good Practice Scheme Workshop, London page 15

Friday 15 November

LMS Graduate Student Meeting, London page 4

Friday 15 November LMS AGM, London page 5

Monday 16 December SW & South Wales Regional Meeting, Swansea

18-21 December

LMS Prospects in Mathematics, Durham page 11

2014

Friday 28 February Mary Cartwright Lecture, York

Monday 31 March Northern Regional Meeting, Durham

NEWSLETTER ONLINE: newsletter.lms.ac.uk

2013 ELECTIONS TO COUNCIL AND NOMINATING COMMITTEE

The LMS 2013 elections will open on 10th October 2013. LMS members will be contacted directly by the Electoral Reform Society (ERS), who will send out the election material.

In advance of this an email will be sent by the Society to all members who are registered for electronic communication informing them that they can expect to shortly receive some election correspondence from the ERS.

Those not registered to receive email correspondence will receive all communications in paper format, both from the Society and from the ERS. Members should check their post/email regularly in October for communications regarding the elections.

With respect to the election itself, there are seven candidates proposed for five vacancies for Member-at-Large. One candidate has been nominated for the new role of Member-at-Large (Librarian). Four candidates have been proposed for two vacancies in the membership of Nominating Committee. The slates and candidate biographies for the election can be found on the LMS website at www.lms.ac.uk/about/council/ Ims-election-2013.

For both electronic and postal

voting the deadline for receipt of votes is 7 November 2013.

Members may like to note that the LMS Election blog, moderated by the Scrutineers, can be found at: http://discussions.lms.ac.uk/ elections2013/.

Future elections

Members are invited to make suggestions for nominees for future elections to Council. These should be addressed to Dr Penny Davies who is the Chair of the Nominating Committee (nominations@lms. ac.uk). Members may also make direct nominations: details will be published in the April 2014 *Newsletter* or are available from Duncan Turton at the LMS (duncan.turton@ lms.ac.uk).

1

ANNUAL GENERAL MEETING

The Annual General Meeting of the Society will be held at 3.00 pm on Friday 15 November 2013 in the Jeffrey Hall at the Institute of Education, 20 Bedford Way, London WC1H 0AL. The business shall be:

- 1. Elections to Council and Nominating Committee
- 2. Report of the President
- 3. Report of the Treasurer: a. adoption of the Trustees Report for 2012/13
- b. appointment of Auditors
- 4. Presentation of De Morgan medal and certificates to LMS Prize winners

http://newsletter.lms.ac.ul

It is hoped that as many members as possible will be able to attend. The Annual General Meeting will be followed by a Society meeting, with the Presidential address, given by Graeme Segal and a lecture by Simon Donaldson (see page 5).

> Fiona Nixon Executive Secretary

LMS Newsletter

http://newsletter.lms.ac.uk

Editorial office: London Mathematical Society, De Morgan House, 57–58 Russell Square, London WC1B 4HS (t: 020 7637 3686; f: 020 7323 3655)

Articles: send articles to newsletter@lms.ac.uk Events calendar: updates and corrections to calendar@lms.ac.uk Advertising: for rates and guidelines see

www.lms.ac.uk/newsletter/ratecard.html

General Editor: Mr A.J.S. Mann (a.mann@gre.ac.uk) Reports Editor: Professor R.A. Wilson (r.a.wilson@gmul.ac.uk) Reviews Editor: Professor D. Singerman (d.singerman@soton.ac.uk) Administrative Editor: S.M. Oakes (newsletter@lms.ac.uk) Typeset by the LMS at De Morgan House; printed by Holbrooks Printers Ltd. Publication dates and deadlines: published monthly, except August. Items and advertisements by the first day of the month prior to publication, or the closest preceding working day. Notices and advertisements are not accepted for events that occur in the first week of the publication month.

News items and notices in the *Newsletter* may be freely used elsewhere unless otherwise stated, although attribution is requested when reproducing whole articles. Contributions to the *Newsletter* are made under a non-exclusive licence; please contact the author or photographer for the rights to reproduce. The LMS cannot accept responsibility for the accuracy of information in the *Newsletter*. Views expressed do not necessarily represent the views or policy of the London Mathematical Society.

Charity registration number: 252660.

ANNUAL LMS SUBSCRIPTION 2013-14

Members are reminded that their annual subscription, including payment for publications, for the period November 2013-October 2014 is due on **1 November 2013** and should be paid no later than 1 December 2013.

In September, the Society sent a reminder to all members to renew their subscription for 2013-14. If you have not received a reminder, please email membership@lms. ac.uk.

Further information about subscription rates for 2013-14 and a subscription form may also be found on the Society's website: www. Ims.ac.uk/content/paying-your-subscription

Please note all members are asked to complete and return the subscription form as it also requests permission to include members' details in the Members' Handbook 2014.

The Society encourages payment by direct debit. If you do not already pay by this method and would like to set up a direct debit (this requires a UK bank account), please visit the LMS website to download the direct debit mandate form: www.lms.ac.uk/sites/de fault/files/Membership/Direct%20Debit%20 Form.pdf.

The Society also accepts payment by cheque or credit/debit card.

Elizabeth Fisher Membership & Activities Officer

MATHEMATICS POLICY ROUND-UP

September 2013

HIGHER EDUCATION

STEM education

The Council for Science and Technology (the Prime Minister's top level, independent advisory board on science and technology policy issues) has written a public letter to education secretary Michael Gove making recommendations on topics within science, technology, engineering, and mathematics (STEM) education. The letter is available at http://tinyurl.com/p3kxbuv.

Destinations of leavers from higher education institutions

The Higher Education Statistics Agency (HESA) has published a report presenting findings from the Destinations of Leavers from Higher Education (DLHE) Longitudinal Survey conducted during winter 2012/13, a bi-annual survey that was first conducted for the cohort of leavers from 2002/03. The survey was carried out among the cohort of students who completed a higher education course at a higher education institution in the UK in 2008/09. The aim of the survey was to collect information on the activities of UK and EU domiciled leavers who completed a higher education course in 2008/09, approximately 3.5 years after leaving higher education. The report provides subject specific information. More information is available at www.hesa.ac.uk/content/view/2939/.

Higher education in facts and figures

Universities UK has produced its annual statistics publication presenting statistics relating to students, staff and finance for the whole of the UK higher education sector. The publication is available at http://tinyurl. com/pwyq9fc. More data tables, with subject specific data, are available at http://tinyurl. com/nn6shtg.

SCHOOLS AND COLLEGES

Popularity of mathematics continues to grow

The number of A-level mathematics entries across the UK is up 2.7% on last year, with 88,060 students sitting the exam. Figures released by the Joint Council for Qualifications also show that:

- A-level further mathematics has continued to increase in popularity, with entries rising by 4.5% (to 13,821)
- AS mathematics entries rose by 1.5% (to 150,787)
- AS further mathematics entries rose by 7.9% (to 22,601)

Full tables of results are available on the Joint Council for Qualifications website at www.jcq.org.uk/examination-results/a-levels.

GCSE results

The number of GCSE mathematics entries has risen by 12.5% compared with last year's entries. 760,170 students sat the exam in 2013 compared with 675,789 in 2012. In other STEM subjects, entries for Biology, Chemistry and Physics rose by 5%, 4.4% and 2.1% respectively.

Full tables of results are available on the Joint Council for Qualifications website at www.jcq.org.uk/examination-results/gcses.

Consultation responses

The LMS has responded to the Department for Education consultations on GCSE subject content and assessment objectives. The LMS response is now available on the LMS website at http://tinyurl.com/pzqfg4g. All responses can be viewed at the *National curriculum review: new programmes of study and attainment targets from September 2014,* which is available at http://tinyurl.com/olp2f8p.

3

The Society has also responded to the Ofqual consultation on GCSE reform. The response is available on the LMS website at lms. ac.uk/policy/reports-and-policy-submissions.

Improving post-16 mathematics skills

The Secretary of State for Education, Michael Gove, has written to a number of bodies and royal societies about improving mathematics skills for 16 to 18-year-olds. The letter is available at http://tinyurl.com/o64wxxm.

OTHER

Women in STEM consultation

The LMS (through CMS) has responded to the House of Commons Science and Technology Select Committee inquiry on Women in STEM Careers. The response is available on the LMS website at Ims.ac.uk/ policy/reports-and-policy-submissions.

> Dr John Johnston Joint Promotion of Mathematics

LONDON MATHEMATICAL SOCIETY GRADUATE STUDENT MEETING

Friday 15 November 2013

Russell Room, CIPR, 52-53 Russell Square, London WC1B 4HP

(Nearest tube: Russell Square)

This meeting is intended as an introduction to the Society Meeting later in the day. All graduate students (and indeed any other mathematicians) will be very welcome.

Preliminary Programme

09.30	Coffee and Registration
10.00	1st Speaker TBC
11.00	Coffee/Tea
11.15	Graduate student talks
12.45	Lunch
13.40	Award prizes
13.45	2nd Speaker TBC
14.45	Close of Meeting
15.00	LMS Annual General Meeting and Society Meeting

Registration

4

To register, please email Elizabeth Fisher (Imsmeetings@Ims.ac.uk) by email by **8 November**. Places are free and all refreshments including lunch will be provided.

Student Talks

Students are invited to give short talks (15 minutes) aimed at a general mathematical audience. Prizes will be awarded for the best two talks. If you would like to give a talk, please email Richard Thomas (richard.thomas@imperial.ac.uk).

Travel

The lectures will be held in the Russell Room, CIPR, 52-53 Russell Square, London WC1B 4HP. For directions see: www.cipr.co.uk/content/venue-and-room-hire/location.

Travel grants of up to £50 are available for students who attend **both** the Graduate Student Meeting **and** the Annual General Meeting.

LMS Annual General Meeting and Society Meeting

The LMS Annual General Meeting is a Society Meeting, which is open to all. **Simon Donaldson** (Imperial College London) will give the first lecture and **Graeme Segal** (Oxford) will give the Presidential Address. The meeting will be held in the Jeffrey Hall at the Institute of Education, 20 Bedford Way, London WC1BH.

After the AGM, there will be a reception at De Morgan House, 57-58 Russell Square. For further details see: www.lms.ac.uk/content/society-meetings.

No. 429 October 2013

LONDON MATHEMATICAL SOCIETY

ANNUAL GENERAL MEETING

Friday 15 November 2013 3.00 – 6.00 pm

Jeffrey Hall, Institute of Education 20 Bedford Way, London, WC1H 0AL. (Nearest tube: Russell Square)

Programme

Annual General Meeting

Simon Donaldson (Imperial College)

Tea/Coffee

Announcement of Election Results

Graeme Segal (Oxford) Presidential Address

The meeting will include the presentation of certificates to the LMS prize winners in 2013.

The meeting will be followed by a reception at De Morgan House, Russell Square, and the Society's Annual Dinner at the Montague Hotel, 15 Montague Street, London WC1B 5BJ. The cost to attend the dinner will be £53 per person.

Those wishing to attend the dinner should contact Leanne Marshall (AnnualDinner_RSVP@lms.ac.uk) by **Monday 4 November**.

For further details about the AGM, please contact Elizabeth Fisher (lmsmeetings@lms.ac.uk).

http://newsletter.lms.ac.uk

No. 429 October 2013

7

Wales Mathematics Colloquium 2013	20-22 May 2013, Wales	A. R. Davies	£1,560
UCL Geometry Day	30 May 2013, UCL	F. Schulze	£600
Riemann-Hilbert Problems and their Applications	29-30 May 2013, Reading	J. Virtanen	£600
One-day Meeting in Combinatorics	5 Jun 2013, Oxford	A. Scott	£2,000
Open Quantum System Identification	10 Jun 2013, Aberystwyth	D.K. Burgarth	£571
Stochastic Differential Delay Equa- tions and Their Applications	10-11 Jun 2013, Strathclyde	X. Mao	£7,000
Uncertainty in Interaction Networks	12-14 Jun 2013, Bath	T. Rogers	£3,333
Conformal Geometry and Function Theory in Mapping, Imaging and Sensing	20-21 June 2013, Imperial Col- lege London	D. Crowdy	£6,000
UK National Conference on Geophysical, Astro- physical and Industrial Magnetohydrodynamics	20-21 Jun 2013, Glasgow	R. Simitev	£2,950
Differential Geometry and Continuum Mechanics	17-21 Jun 2013, ICMS	M. Grinfeld	£1,600
Relativistic Quantum Information (North)	24-26 Jun 2013, Nottingham	J. Doukas	£4,000
Continuity, Computability, Constructivity	26 Jun - 1 Jul 2013, Gregynog	M. Seisen- berger	£5,330
Spectral Analysis and Differential Equations	1-2 Jul 2013, Cardiff	I. Wood	£5,410
24th British Combinatorial Conference	30 Jun - 5 Jul 2013, RHUL	S. Gerke	£6,000
Combinatorics, Algebra, and More: A Conference in Celebration of Peter Cameron	8-10 Jul 2013, QMUL	L.H. Soicher	£3,095
Conference on Intelligent Computer Mathematics	8-12 Jul 2013, Bath	J.H. Davenport	£5,870
Groups St Andrews 2013	3-11 Aug 2013, St Andrews	M. Quick	£7,000
Mathematical Modelling of Ecology and Evolution	12-15 Aug 2013, York	J. Pitchford	£6,870
Fundamentals of Computation Theory	19-21 Aug 2013, Liverpool	I. Potapov	£2,660

During the financial year 2012/13 the soci- f

SOCIETY CONFERANCE GRANTS

ety awarded 64 grants, totalling £217,700, in the support of mathematical conferences. Funds are granted to the organisers of conferences to be held in the United Kingdom, and may be used to cover the expenses of principal speakers, and to provide support for research students and

for participants from Scheme 5 or former Soviet Union countries. For Postgraduate Research Conferences funds are granted to support participants. Applicants wishing to apply for funding for a conference will find further details on the Society's website at www.lms.ac.uk/content/ research-grants.

Conference grants awarded during 2012-13

Conference	Dates, Place	Applicant	Grant
Legacy of Goodstein	14 Dec 2012, Leicester	R.M. Thomas	£3,000
Winter Combinatorics Meeting	30 Jan 2013, Open University	R. Brignall	£520
Hyperbolic Equations: Solvabil- ity and Asymptotic Properties	13 Feb 2013, Loughborough	C. Garetto	£500
A Meeting to Celebrate the 80th Birthday of Tom Kibble	13 Mar 2013, Imperial College London	J. Gauntlett	£4,000
UCL Geometry and Topology Days	20 Feb and 20 Mar 2013, UCL	J. Lotay	£600
Finite Simple Groups, Algebra- ic Groups and their Impact	10 April 2013, Birkbeck	B. Fairbairn	£555
BAMC 2013	9-12 Apr 2013, Leeds	D.W. Hughes	£5,000
Integrable Models, Conformal Field Theory and Related Topics	12-13 Apr 2013, Hertfordshire	C. Young	£1,580
Geometric and Topological Graph Theory	15-19 Apr 2013, Bristol	A. Nixon	£1,000
Inaugural Meeting in Algebraic Geometry	Apr 2013, Warwick	D. Testa	£600
Mathematical Models of Biological Evolution: Recent Progress, Current Challenges and Future Directions	1-3 May 2013, Leicester	A. Morozov	£3,300
String Math UK (SMUK)	10-11 May 2013, Surrey	M. Wolf	£3,430
Two linked one-day colloquia in Combinatorics	15-16 May 2013, QMUL and LSE	J. Skokan	£3,000

8

http://newsletter.lms.ac.u

One-day Function Theory Meeting	2 Sep 2013, De Morgan House	D. Nicks	£1,746
Advanced Decomposition Methods for Partial Differential Equations	2-4 Sep 2013, Kingston	C-H. Lai	£4,000
Fibre-reinforced Materials: Theory and Applications Euromech Colloquium 551	2-5 Sep 2013, Nottingham	K.P. Soldatos	£7,000
Algebra, Combinatorics, Dynamics and Applications	2-5 Sep 2013, QUB	N. Iyudu, S. Shkarin	£5,200
British Logic Colloquium 2013, with Dummett Day	4-7 Sep 2013, Leeds	H.D. Macpher- son	£4,055
Recent Trend in Classical and Complex Fluids	5-7 Sep 2013, Sussex	M. Dashti	£2,000
British Topology Meeting	6-11 Sep 2013, Aberdeen	R. Hepworth	£5,000
Spectral Geometry, Chaos and Dynamics	9-13 Sep 2013, Loughborough	B. Winn	£5,404
From Spectral Gaps to Particle Filters	17-18 Sep 2013, Reading	R. Everitt	£2,400
Mathematical Challenges in Bubbles and Biological Fluid Mechanics	19 Sep 2013, Birmingham	P. Flavell	£5,440
Classifying Structures for Operator Algebras and Dynamical Systems	16-20 Sep 2013, Aberystwyth	D. G. Evans	£5,100
Stochastic Analysis and Applications	23-27 Sept 2013, Oxford	D. Crisan	£7,000
Aspects of PDEs	27 Sept 2013, Warwick	A. Malchiodi	£600
Integrable Systems in Newcastle	4-5 Oct 2013, Northumbria	S. Lombardo	£1,550
Derived Categories and Algebraic Geometry	17 Oct 2013, Cardiff	T. Logvinenko	£560
C*-algebras in Scotland	26 Oct 2013, Aberdeen	A. Tikuisis	£600
Network Coding, Partitions and Security	6 Nov 2013, Durham	M. Gadouleau	£542
Graphs, Groups & Probability	15 Nov 2013, Warwick	A. Georga- kopoulos	£600

newsletter@lms.ac.u

No. 429 October 2013

Noncommutative Geometry	29 Nov 2013, Glasgow	C. Voigt	£600
Workshop on Combinatorial Physics	17-19 Dec 2013, Cardiff	R. Behrend	£1,920
Interfaces Between Numerical Analysis and Computational Statistics	15 Jan 2014, Southampton	K. Zygalakis	£600
International Workshop on Operator Theory	3-5 Sep 2014 Queen's Uni- versity Belfast	M. Mathieu	£6,010
Joint meeting of the BMC and BAMC	30 Mar - 2 Apr 2015 Cambridge	R. Camina	£15,000

Postgraduate Research Conference grants awarded during 2012-13

Conference	Dates, Place	Applicant/Organiser	Grant
Young Functional Analysts' Workshop	20 - 22 March 2013, Sheffield	Applicant: P. Mitchener Organisers: V. Quigley	£3,938
Char p Methods in Algebraic Geometry	2 - 5 April 2013, Imperial College London	Applicant: P. Cascini Organisers: A. Fanelli, J. Martinez-Garcia	£4,000
Quantum Fields, Gravity and Information	3 - 5 April 2013, Nottingham	Applicant: D. Riley Organisers: A.R. Lee, S. Tavares, N. Friis	£4,000
Young Topology Meeting UK	25-26 April 2013, Imperial College London	Applicant: J. Gibbons Organiser: S. Barthel	£2,565
Young Researchers in Mathematics 2013	17 - 20 June 2013, Edinburgh	Applicant: K. Brown Organiser: A. Rovi	£5,800
15th Postgradu- ate Group Theory Conference	2-4 July 2013, Manchester	Applicant: P. Rowley Organiser: P. Bradley	£4,000
2013 Postgradu- ate Combinato- rial Conference	14-16 August 2013, RHUL	Applicant: I. Moffatt Organiser: A. MCDowell	£4,000
Novembertagung on the History of Mathematics	20-22 November 2013, De Morgan House, London	Applicant: I. Short, Organisers: R. Cret- ney, M. Walker	£2,947
British Postgradu- ate Model Theory Conference	13-15 January 2014, University of Leeds	Applicant: J. Truss Organisers: D. Wood, R. Barham	£4,000

9

The Prize

Nominations

Call for NOMINATIONS

impact on scientific, business, financial, and engineering applications.

of his/her research or for his/her lifetime achievement.

supporting letters. Nominations should be submitted to:

c/o Liu Bie Ju Centre for Mathematical Sciences

Deadline for nominations: 31 December 2013

ceremony and to present a lecture at the conference.

Mathematics, an international award.

self-nominations will not be accepted.

Selection Committee

Presentation of Prize

University of Washington).

http://www.cityu.edu.bk/lbj/

Tat Chee Avenue Kowloon Hong Kong

City University of Hong Kong

Or by email to: mclbj@cityu.edu.hk

William Benter Prize in Applied Mathematics 2014 LONDON **Durham** MATHEMATICAL SOCIETY University You are invited to the conference LMS Prospects in Mathematics The Liu Bie Ju Centre for Mathematical Sciences of City University of Hong Kong is inviting nominations of candidates for the William Benter Prize in Applied A Symposium for Potential Research Students in Mathematics Are you considering Ph.D. study in Mathematics for entry in 2014? If yes, this meeting is for you! The Prize recognizes outstanding mathematical contributions that have had a direct and fundamental To be held on 18-20 December 2013 at the It will be awarded to a single person for a single contribution or for a body of related contributions Department of Mathematical Sciences **Durham University** The Prize is presented every two years and the amount of the award is US\$100,000. The meeting is aimed at final year undergraduate (and MSc) students across the UK considering Ph.D. study in Mathematics for entry in 2014. Nomination is open to everyone. Nominations should not be disclosed to the nominees and The aim of the conference is to introduce some of the many and varied opportunities for research in mathematics that exist at universities in the UK. A nomination should include a covering letter with justifications, the CV of the nominee, and two Speakers will share their passion for mathematics by describing the type of questions they are working on, and will discuss where their research topic is being actively studied in the UK. Moreover, information about funding opportunities (including the Doctoral Training Centres in Mathematical Sciences) will be available. Participation is FREE but numbers are limited. Partial travel support will be available. All applications received by 15 November 2013 will be considered. Please register on-line at the meeting webpage: www.maths.dur.ac.uk/events/Meetings/Prospects/2013/ The recipient of the Prize will be announced at the International Conference on Applied Mathematics 2014 from 1 to 5 December 2014. The Prize Laureate is expected to attend the award Speakers: The Prize was set up in 2008 in honor of Mr William Benter for his dedication and generous support Margaret Beck (Heriot-Watt) Alina Vdovina (Newcastle) to the enhancement of the University's strength in mathematics. The inaugural winner in 2010 was George C Papanicolaou (Robert Grimmett Professor of Mathematics at Stanford University), and the Tara Brendle (Glasgow) Sanju Velani (York) 2012 Prize went to James D Murray (Senior Scholar, Princeton University; Professor Emeritus of Dorothy Buck (Imperial College) Andrew Wade (Durham) Mathematical Biology, University of Oxford; and Professor Emeritus of Applied Mathematics, Edward Crane (Bristol) Richard Ward (Durham) Gianne Derks (Surrey) Sarah Zerbes (University College) The Liu Bie Ju Centre for Mathematical Sciences was established in 1995 with the aim of supporting Alexander Strohmaier (Loughborough) world-class research in applied mathematics and in computational mathematics. As a leading research centre in the Asia-Pacific region, its basic objective is to strive for excellence in applied If you have any questions, please email andrew.wade@durham.ac.uk mathematical sciences. For more information about the Prize and the Centre, please visit Supported by the London Mathematical Societ City University The Department of Mathematical Sciences and Faculty of Science, Durham University Image: View from Durham Cathedral

newsletter@lms.ac.uk

MEETING OF THE LMS EDITORIAL ADVISORY BOARD 2013

The Editorial Advisory Board of the London Mathematical Society met at De Morgan House on 6th of September, with the vast majority of the members of the board being present, as well as all seven editors of the various journals. Susan Hezlet and other members of the publications team also took part, with the Publications Secretary, John Jones, acting as chair. Neil Scriven of OUP gave a presentation after lunch.

The meeting brought together a collection of both wise old heads and young neophyte advisers. Despite, or perhaps because of, the splendid Turkish meal in which the board had indulged on the previous night, the discussion was a rather wide ranging one, touching upon matters of current interest and concern for the publishing side of the LMS's activities.

The editors presented reports on their various journals and on the whole the news seemed good. Many practical issues were addressed over the course of the day: Of

12

course problems with referees date back to the dawn of time, but there are a slew of newer issues associated with the Internet Age. The web-based system the journals have in place has much to commend it, but it's being noted by some that this is making paper flow harder to predict. There was discussion of a usage analysis which showed a remarkable increase in the proportion of papers with arXiv versions, as well as some detailed cluster & competitor analysis presented by Susan Hezlet. An account was given by Neil Scriven of OUP of the work he does on the journals, and this resulted in some suggestions of mechanisms by which outstanding papers could be selected for marketing purposes.

The meeting concluded with the resolution that the Board should meet again two years from now, or maybe three.

> Darren Long University of California, Santa Barbara



LMS Advisers, the publications secretary and publications staff in the De Morgan House gardens



Charter for women in science Recognising commitment to advancing women's careers in STEMM academia

Being a member of the assessment panel

The London Mathematical Society strongly supports advancing women's careers in university mathematics departments. The LMS Women in Mathematics Committee has developed a *Good Practice Scheme* with the aim of supporting mathematics departments interested in embedding equal opportunities for women within their working practices. The Scheme provides specific support for departments working towards Athena SWAN Award status. Athena SWAN Awards recognise success in developing employment practices to further and support the careers of women in science, technology, engineering, mathematics and medicine (STEMM) departments in higher education.

I have been a member of two Athena SWAN assessment panels in March and June of this year. Both panels had an odd number of members, consisted of academics and administrators (usually from Human Resources), had both female and male members and guidance from two members of Athena SWAN. When considering applications from departments, one of the panel was a subject specialist, i.e. when considering an application from a Mathematics department one of the panel is a Mathematician. Here I outline what the panels I have experienced like and dislike.

General comments

- Ensure that the self-assessment committee is balanced, has female and male members and includes a member of the department's management team. The panels felt it was very important that the senior management team of the department were seen to be fully engaged with the process (and be represented on the team). It is important that if the committee recommends changes in departmental procedures that there is someone with the seniority to see that this happens.
- The panel is sent copies of the applications in {black and white}, so {colour} diagrams are not as effective and in some cases were quite

difficult to read. If you want the panel to consider a colour version of your application, then you have to send the relevant number of copies of it to the Equality Challenge Unit. The panel is also sent an electronic version of the applications which a member might print in black and white regardless.

- The panels felt that ideally the Head of Department letter should talk about a strategic vision, but essentially none of them did!
- Don't make the diagrams, tables and data analysis highly technical and complicated. Not all members of the panel are necessarily numerate!
- The panels really wanted an honest assessment of where the department is and were not happy if they thought applications were trying to hide something or were just too complacent.}
- For *Silver awards*, the panels looked for activities that had been happening for a period of time (years), with *measurable* effect.

Self-assessment

- Analyse your data *honestly*. The panels liked (and commended), applications that were very honest in their assessment of the current situation. If in your self-assessment of the department there is a major issue then say so and use the Action Plan to show how you're going to address the issue.
- Be consistent when comparing your data to that of other departments in your discipline.
 Either compare your data to the national average, or compare with a set of comparator universities (with reasons). For example, members of the Russell Group (or the 1994 Group) might compare themselves to other members of the Group, to the Group average, or to the national average.
- The data does need to be complete and well presented -- and then (very importantly) there needs to be honest reflection on what the data is saying, what the key issues are and what actions are proposed to try and address the issues. The panels really liked an application that referred to the action plan in the main text.
- If there are different groups within the de-

partment of different natures then the data should be separated out for each group.

Organisation and culture

- A diagram of committees and reporting structures was seen to be a good thing. Some departments had committees, e.g. promotion and research, entirely made up of male professors that made key decisions -- this was not liked. Careful placing of women on important strategic committees was liked. This is particularly important for departments with very few women.
- Recruitment: give the gender percentages for applications, interviewed and appointed. If there are issues, what are your strategies for addressing them?
- · Promotions: give the gender percentages of applications and success. How do you identify, develop and mentor women for promotion?

• Having Athena SWAN activities recognised in workload planning (for all the self-assessment team) would go down very well. It was thought that the chair [of the Athena SWAN committeel should have a similar allowance to chairs of other major department committees -- but it was not clear that this happened very often.

Flexibility and managing career breaks

- Can staff request flexible working, e.g. 'family friendly lecture times' (such as no 9am and/or 5pm lectures)?
- Are all departmental meetings in 'core hours' (e.g.10am-4pm)?
- Many departments had informal flexible working/paternity leave without anything being requested formally.
- Keeping in Touch days were mentioned a few times but there was not much description of how these were used to help the woman's career (rather than just help the department!).}
- University funded schemes to assist those returning from maternity leave were particularly liked.
- Does your department have procedures for giving those returning from maternity leave reduced teaching and administrative loads? Examples include: reduced teaching loads

for a period after returning from maternity leave: 6 to 12 months with no teaching after returning from maternity leave; making appointments to cover the teaching of people on maternity leave (rather than saying that it was covered by existing members of the department).

 The panels were keen to hear about staff taking paternity leave.

Other comments

The panels wanted departments to be thinking pro-actively about how to recruit more women members of staff. Just adding something to advertisements ("We particularly welcome female applicants ...") or having one woman on an interview panel was not really seen as sufficient. Examples of good practice include:

- LMS Good Practice Scheme supporters can show their support for the scheme on their homepage.
- Look at the images on your department's homepage and in publicity material (e.g. student prospectus). What message do they give about gender participation in the department?
- Circulate job advertisements widely, use academic networks and mailing lists, e.g. European Women in Mathematics.

Action plan

The panels felt that most of the action plans were too vague -- they wanted concrete, realistic targets. There was an acceptance that if figures were already above the national average then a realistic target might be just to maintain this.

For further information about the LMS Good Practice Scheme see www.lms.ac.uk/women/ good-practice-scheme

A Good Practice Scheme Workshop will be held on 31 October 2013 where participants will be able to hear about and discuss the process of applying for Athena SWAN. Details are available on the following page and on the website.

> Peter A. Clarkson (Chair of the LMS Good Practice Scheme Steering Committee) University of Kent

GOOD PRACTICE SCHEME WORKSHOP LONDON MATHEMATICAL SOCIETY GOOD PRACTICE 31 October 2013 SCHEME

Registration is now open for a Good Practice Scheme workshop to be held on Thursday 31 October 2013 in London.

The workshop will provide individuals and departments with knowledge and tools they can use to improve recruitment and retention of women in mathematics. This may include making an application for Athena SWAN status. It is aimed at those who have not previously attended a GPS workshop, although those who have are also welcome if they think it would be useful to them.

Participants will:

- hear about how the LMS Good Practice Scheme can support Departments working towards recruiting and retaining more women in mathematics
- hear from Paul Walton, former Head of

CAMBRIDGE

Analytic

in Several

Variables

Robin Pemantle,

Mark C. Wilson,

University of Auckland

University of Pennsylvania

Combinatorics

· First and only book on the theory of

multivariate generating functions

· Designed to be readable by graduate

students after just one year of graduate study

combinatorics, probability and statistical physics

Cambridge Studies in Advanced Mathematics, No. 140

Hardback | 9781107031579 | August 2013 | £45.00

www.cambridge.org/pemantle

· Includes many worked examples and devotes a chapter

to expository examples that tie in with applications in

Summarizes a decade of new research by the authors

Michael Baake. Uwe Grimm, The Open University, Milton Keynes

Volume 1:

 An accessible introduction suitable for graduate students in science

- The first of a comprehensive multi-volume series covering aperiodic order and its applications
- · Includes over 150 illustrations and examples

Series: Encyclopedia of Mathematics and its Applications, No. 149 Hardback | 9780521869911 | August 2013 | £75.00



APERIODIC







No. 429 October 2013

Chemistry at the University of York – the first department to receive an Athena SWAN Gold award

- hear from Athena SWAN about the process of applying for Bronze, Silver and Gold Award department status
- · hear from departments already engaged in the process of applying for Athena SWAN status
- make useful contacts with other departments active in promoting the careers of women in maths

To register for the workshop please email womeninmaths@lms.ac.uk (attendance is free, but numbers are required for catering purposes).

The workshop will be held at De Morgan House, 57-58 Russell Square, London WC1B 4HS.

The LMS report Advancing Women in Mathematics: Good Practice in UK University Departments is available to download from www.lms.ac.uk/women-mathematics or a printed copy may be requested from womeninmaths@ Ims.ac.uk.

www.cambridge.org/baakegr

www.cambridge.org





http://newsletter.lms.ac.uk

ewsletter@lms.ac.ul

CECIL KING TRAVEL SCHOLARSHIP 2012

Report

16

It was my great honour and privilege to be the recipient of the 2012 Cecil King Travel Scholarship. The scholarship afforded me the rare opportunity to spend the spring quarter of 2013 as a visiting graduate researcher at the University of California, Los Angeles. As an algebraist with broad interests in the theory of torsors and projective homogeneous varieties under actions of linear algebraic groups over arbitrary fields, the wealth of leading experts in closely related branches of algebra and algebraic geometry which UCLA counts among its faculty made it an ideal choice of host institution for my travel. During my stay, I worked primarily on a project which seeks to investigate properties of certain invariants of guadratic forms defined in terms of algebraic cycles on their associated orthogonal Grassmannian varieties. This line of research is part of a wider programme of study on discrete motivic invariants of projective homogeneous varieties which has led to great advances in the theory of quadratic forms and related structures in recent decades. The principal sponsor of my visit,

variants of projective homogeneous varieties which has led to great advances in the theory of quadratic forms and related structures in recent decades. The principal sponsor of my visit, Professor Alexander S. Merkurjev, is among the most renowned experts in this field, and I profited greatly from regular discussions with him throughout my stay. My visit to UCLA



Stephen Scully

was ultimately a very enjoyable and rewarding experience. It presented me with an invaluable opportunity to interact with leading mathematicians and graduate students in my area of research, which is rather underrepresented in the UK at present. I am very grateful to the London Mathematical Society and Cecil King Memorial Foundation for giving me this unique opportunity, and I feel certain that the new personal connections and mathematical insights which I acquired during my travel will stand to me greatly in the coming years as my career develops.

Stephen Scully Max-Planck-Institut für Mathematik, Bonn

CECIL KING TRAVEL SCHOLARSHIP 2013

The London Mathematical Society annually awards a £5,000 Cecil King Travel Scholarship in mathematics, to a young mathematician of outstanding promise. The scholarship is awarded to support a period of study or research abroad, typically for a period of three months. Study or research in all areas of mathematics is eligible for the award.

The 2013 Cecil King Travel Scholarship has been awarded to Andrew Macpherson (Imperial College London), who will visit the University of California, San Diego (UCSD). Andrew's research is into certain geometric constructions in mirror symmetry, a subject that ties together algebra, geometry, and theoretical physics. It is based on an application of non-Archimedean geometry, which is a concept originating in number theory that members of mirror symmetry circles have only recently begun to employ.

During his visit to UCSD, Andrew will work with Professor Mark Gross, a world leader in the field responsible for some of its most ambitious projects. The so-called Gross-Siebert programme outputs, among other things, the affine manifolds associated by mirror symmetry to a degeneration of complex Calabi-Yau varieties. Andrew's work is complementary, attempting to give an alternative construction via the non-Archimedean geometry.



CECIL KING TRAVEL SCHOLARSHIP

The London Mathematical Society annually awards a £5,000 Cecil King Travel Scholarship in Mathematics, to a young mathematician of outstanding promise. The Scholarship is awarded to support a period of study or research abroad, typically for a period of three months. Study or research in all areas of mathematics is eligible for the award.

The award is competitive and based on a written proposal describing the intended programme of study or research abroad, and the benefits to be gained from such a visit. A shortlist of applicants will be selected for an interview during which they will be expected to make a short presentation on their proposal.

Applicants must be nationals of the UK or the Republic of Ireland, either registered for or having completed a doctoral degree within 12 months of the closing date.

Applications should be made using the form available on the Society's website (www.lms.ac.uk/content/cecil-king-travel-scholarship) or by contacting education@lms.ac.uk. The closing date for applications is **Friday 7 March 2014**. It is expected that interviews will take place in London in late April or early May.

The Cecil King Travel Scholarship was established in 2001 by the Cecil King Memorial Fund. The award is made by the Council of the London Mathematical Society on the recommendation of the Cecil King Prize Committee, nominated by the Society's Education Committee.

EUROPEAN NEWS

Gran Sasso Science Institute

The GSSI is a newly established international PhD school and a centre for advanced studies in physics, mathematics, computer science and social sciences, located in the historical city centre of L'Aquila (Italy). PhD degrees in mathematics and physics will be issued jointly with SISSA-ISAS Trieste. The Institute will provide students with free housing plus the standard three years PhD grant (gross 16,160 per annum). The current deadline for applications has passed, but further information can be found at www.gssi. infn.it.

[Source: http://euro-math-soc.eu/node/3935]

Network of International Mathematical Centres

At a meeting in Paris on 1 June this year four international mathematical centres agreed a programme of cooperation: The Abdus Salam School of Mathematical Sciences in Lahore (Pakistan), the Centro de Investigacion en Matematicas in Guanajuato (Mexico), the Vietnam Institute for Advanced Studies in Mathematics in Hanoi (Vietnam) and the Instituto Nacional de Matemática Pura e Aplicada in Rio de Janeiro (Brasil). In particular, they are initiating a program of NIM Fellowships for PhD students and postdocs of the member institutions, as well as faculty and staff mobility between NIM Centres.

[Source: http://euro-math-soc.eu/node/4025]

Russian Academy of Sciences (ctd.)

In its current session the Russian Duma will have to discuss and finally pass a law on a reform of the Russian Academy of Sciences (RAS) that was originally launched by the Russian government without consultations with the scientific community. The RAS plans to adopt a declaration summarizing key requests from the scientists

to be presented to the Duma in due time. Russian colleagues have formulated a petition to President Putin asking him to make sure that the future law will come in place after a thorough consultation with the scientific community. Information: http://save-russian-academy.org.

[Source: http://euro-math-soc.eu/node/4028]

EMS Committee for European Solidarity

Formerly the Committee for Support of East-European Mathematicians, the Committee for European Solidarity will undertake actions to foster the development of mathematics in economically less-favoured regions within the geographical area of EMS membership and through the following means:

- Awarding travel grants to young qualified mathematicians.
- Promoting and funding training activities, such as advanced courses or workshops at an early-career level.
- Supporting bilateral and multilateral regional conferences.
- Raising new scientific initiatives.
- Offering advice and assistance about the launching of development projects.
- Easing access to research resources, including digital libraries.

Proposals for activities from EMS members are greatly welcomed. The Chair of the Committee is Carles Casacuberta (U. of Barcelona), email carles.casacuberta@ ub.edu.

[Sources: EMS Newsletter Sept 2013, pp 7-8 and www.euro-math-soc.eu/comm -eur-solid.html]

José Luis Rubio de Francia Prize 2012

María Pe Pereira, visiting professor at the Université de Lille, has been awarded the José Luis Rubio de Francia Prize for 2012. According to the jury statement supporting their decision: "María Pe Pereira (Burgos, 1981) has made some outstanding mathematical contributions to singularity theory, especially in connection to the celebrated Nash problem on arcs for surface singularities. The Nash problem, posed by John Nash in 1968, has been one of the central problems in singularity theory over the last 40 years. In her PhD thesis, in 2011, Maria Pe constructed a unified proof for all quotient singularities of a positive solution to Nash's problem on arcs. Her thesis contained new techniques and insights that could be used in a more general context. Subsequently, Pe Pereira and her PhD advisor Javier Fernández de Bobadilla solved [the Nash problem] in its full generality."

The José Luis Rubio de Francia Prize is awarded by the Real Sociedad Matemática Española (RSME) under the patronage of the Universidad Autónoma de Madrid and the Universidad de Zaragoza, and its aim is to recognise and encourage young mathematicians. Recipients should not be older than 32. It is endowed with €3.000 and carries the invitation to give one of the plenary talks at an RSME Congress. The jury for this year's José Luis Rubio de Francia award was chaired by Jesús Bastero and consisted of Professors Noga Alon, Pablo Mira, Gilles Pisier, Marta Sanz-Solé, Agata Smoktunowicz and Cédric Villani. More information can be found at www. rsme.es/content/view/1282/1.

[Source: EMS Newsletter Sept 2013, p. 14]

Abel Laureate interviews

Newsletter readers may be interested in an extensive interview with Abel Laureate Pierre Deligne in the EMS Newsletter September 2013, conducted by Martin Raussen (Aalborg, Denmark) and Christian Skau (Trondheim, Norway). They have together interviewed all Abel laureates since 2003.

EMS Publications Committee

The Committee is preparing a position paper on open access (OA) publication that includes (among many other topics) consideration of an EMS common platform for European Mathematics. The Chair is Bernard Teissier (Paris).

In 2002 the EMS launched its Publishing House (EMS PH), dedicated to the publication of high quality peer-reviewed journals and books in all fields of mathematics. Today the EMS PH publishes fifteen journals, which are distributed by the traditional subscription model. This amounts to approximately 290 full packages, 2,000 individual subscriptions, 600 exchange copies, and 600 free copies.

Recently, the EMS has appointed a Publications Committee whose job is to give advice to the Executive Committee on publications issues, to analyze, to promote debate, and to keep the mathematical community informed about new trends in publications. This allows the EMS to take an active role in adopting new publishing models and to provide its membership with a forum for exchanging views and ideas.

Some of the Committee's practices and views on journal publishing are the following:

One of the benefits of EMS membership is free online access to JEMS [Journal of the EMS]. We are currently considering extending this to other journals. The EMS allows authors of their journals to post a pre-publication manuscript in any noncommercial environment, provided proper credit is given to the original source. On request, the EMS provides authors with the final peer-reviewed manuscript. which may be posted on his or her home institution's non-commercial repository. Through ICTP's electronic Journal Delivery Service (http://ejds.ictp.it/ejds/) all articles from EMS journals are made available free of charge to mathematicians in countries whose economy does not allow them to purchase subscriptions. Seven of the journals owned or hosted by the EMS are publicly accessible after a five year moving wall.

The EMS endorses the general princi-

newsle

newsletter@lm

LMS NEWSLETTER

ple of allowing free reading access to scientific results, and declares that in all circumstances, the publishing of an article should remain independent of the economic situation of its authors. We therefore do not support any publishing models in which the author is required to pay charges (APC). In particular, the EMS regards the so-called hybrid model (journals that publish APC articles along with 'regular' articles) as unsuitable and potentially disadvantageous for libraries. It is interesting to note that, so far, the EMS PH has not received a single enquiry about APC publication.

[Source: EMS Newsletter June 2013, pp 3-4]

David Chillingworth LMS/EMS Correspondent

NEWS FROM ZBMATH

More than new clothes

20

The reviewing and abstracting service zb-MATH (former Zentralblatt MATH), which is edited by FIZ Karlsruhe, the European Mathematical Society (EMS) and the Heidelberg Academy of Sciences and Humanities, offers at www.zbmath.org a new user interface with improved functionalities and a user friendly design.

The new website takes advantage of many opportunities offered by modern browsers, guiding the users quickly to the required information. The search is organised in different tabs – documents, authors, journals, classification, software – allowing to focus on a specific type of information. Our goal was to structure the information in an easily and intuitively comprehensible manner: if you are interested in author profiles, then you use the author tab; whenever you click on an author's name, her or his author profile page is presented; a journal title links to the corresponding journal profile; and

clicking on the number of documents a certain person has published in a certain mathematical area brings you to exactly those documents in our database, where you can read reviews or abstracts of the articles and access, in most cases, their full texts.

The main novelty of the user interface is the filter function which helps to refine the original search by presenting the authors, journals, MSC codes and publication years according to their frequency. Furthermore, the filter allows to formulate search queries that go much further beyond the evaluation of a single publication. For instance, one can quantitatively analyse the development in a specific field or ask for the most prolific authors in certain journals.

The filter also allows us to better interlink the author profiles with the rest of the database. For every author, all coauthors, mathematical areas and journals are displayed according to their frequency, and direct links to the selected publications as well as to the corresponding author and journal profiles or the research fields are available. A timeline of all publications are displayed as a clickable diagram, visualising the author's scientific output over the years.

Journals indexed in zbMATH are presented in a similar fashion. Besides the obvious advantage for librarians, this information can be valuable for everyone who wants to evaluate the changes in the scientific journal landscape. For instance, PhD students or young researchers might profit from consulting a journal profile in zbMATH in order to decide whether her or his publication would be well presented there.

As a new facet, the database swMATH, which provides information on mathematical software packages, is now included in zbMATH and directly linked to relevant publications. A prototype for semantic formula search is another result of our research and development projects, which will also be included soon. Further technical improvements are already on the way. For example, users will soon be able to set different individual preferences, such as the display format (eg LaTeX, MathML, MathJax, PDF), the number of presented results or the fuzziness of the search.

It is planned to unlock the new zbMATH surface in the fall for a limited time worldwide. Until then, everyone has, as usual, free access to the first three matches of a search query.

We hope that you enjoy the new website and we welcome any feedback that helps us to improve our service to the mathematical community.

We hope that you enjoy the new website www.zbmath.org.

Gert-Martin Greuel, Helena Mihaljevic-Brandt, Olaf Teschke

About Contact General Help Reviewer Servie	ce Subscriptio	on	Log-In 👻
ZDMATH Documents Authors Journals Classification Soft	ware		
		Structure	d Search 🔳
moonshine	Q Fi	ields 🕶	Operators -
Page 1 of 3 first page + + + last page prev 100 documents next 100 do	cuments		Help 🔻
Found 290 documents (Results 1-100)			
Miyamoto, Masahiko	Filter resu	Its by	
A \mathbb{Z}_3 -orbifold theory of lattice vertex operator algebra and \mathbb{Z}_3 -orbifold constructions.	Authors		chow all *
(English) Zbloe192933	Addiois	(100)	snow all +
Iohara, Kenji (ed.) et al., Symmetries, integrable systems and representations. Proceedings of the	Mason, Geo	Hung (10	
conference on infinite analysis: frontier of integrability, Tokyo, Japan, July 25-29, 2011 and the	Dong, Chor	navina (17	0
conference on symmetries, integrable systems and representations, Lyon, France, December 13-16,	Lepowsky.	James (13	3)
2011. London: Springer (ISBN 978-1-4471-4862-3/hbk; 978-1-4471-4863-0/ebook). Springer	Tuite, Micha	ael P. (12)	160
Proceedings in Mathematics & Statistics 40, 319-344 (2013). :10.1007/978-1-4471-4863-0 13			
BINTAX Sell Taxt DOI	Journais	a viter meter	show all •
DOTEX POLICE DO	Journal of A	lgebra (1	7)
Ganter Nora	Communica	itions in N	lathematical
Power operations in orbifold Tate K-theory (English) 75108189101	Physics (10)	tath amating
Homology Homotopy Appl 15 No. 1. 313-342 (2013)	Recearch N	national N	athematics
MSC: 191.99	Duke Mathe	matical I	ourpal (7)
Bibliok Full Text DCt MPG 45 STEX	Communica	tions in A	kaebra (7)
	01		goura (17
Norton, Simon P.; Wilson, Robert A.	Classificat	ion	show all -
A correction to the 41-structure of the Monster, a construction of a new maximal	17-XX (171))	
subgroup L ₂ (41) and a new Moonshine phenomenon. (English) Zb106188932	20-XX (155))	
J. Lond. Math. Soc., II. Ser. 87, No. 3, 943-962 (2013).	11-XX (144))	
MSC: 20D08 20E28	81-XX (51)		
Hestax Huiltan Don MPG & SHSX	14-77 (25)		
	Publication	Year	show top 5 -
Miezaki, Tsuyoshi	2013 (6)		
Conformal designs and D.H. Lehmer's conjecture. (English) Zb106186992	2012 (10)		
J. Algebra 374, 59-65 (2013).	2011 (7)		
MSC: 17B69 11F03 05E99	2010 (22)		
BibTeX Full Text DOI	2009 (7)		
	2008 (8)		
Hartmann, Heinrich	2007 (15)		
Period- and mirror-maps for the quartic K3. (English) Zb106179660	2006 (10)		
Manuser, Math. 141, No. 3-4, 391-422 (2013).	2005 (3)		
MSC: 14J28 14D07 14J33	2004 (13)		
BibText Pull Text DOI	2003 (11)		
	2002 (10)		

http://newsletter.lms.ac.uk

HEROINES OF COMPUTING

A new Women in Computing Gallery, sponsored by Google UK, has been opened at The National Museum of Computing (TNMOC) on Bletchley Park by technology entrepreneur Dame Stephanie Shirley. The Gallery highlights the pioneering role that women have played in the development of computing and has been designed to inspire many more girls to take up computing as a career. The opening of the new gallery formed part of a Google-inspired *Heroines of Computing* event at Bletchley Park involving both the Bletchley Park Trust and The National Museum of Computing.



The gallery with six 24" touchscreens displaying intuitive and interactive digital signage.

The idea for the gallery was sparked when the Museum discovered that only 10% of students coming from schools and

colleges on its acclaimed Learning Programme were female. Together with Google the idea for the new TNMOC gallery took shape.

22

Using the latest in interactive digital signage display technology, the gallery presents a multimedia tribute to female pioneers of computing.Six large hois TIMOC

Dynamic photo electronic montage of women in computing from the Computer Weekly archive

touch screens offer intuitive interactive access to videos, photographs, graphics and text telling many of the little-known stories of women in computing. Artefacts in the Gallery include a beautiful reproduction of a scrapbook of Dame Stephanie Shirley's career at F International, the hugely successful company she founded.



Dame Stephanie Shirley cutting the paper tape ribbon (with punched message Women in Computing) to open the gallery.

Dame Stephanie Shirley in opening the gallery said: 'Girls must take advantage of the revival of computing in schools and recognise and grab the opportunities that our wonderful sector offers. Britain's economy demands that women are not just consumers, but rather creators of new technologies and applications. This new Women in Computing gallery at TNMOC will promote positive role models for women and so encourage girls and women in critical thinking and engineering. It shows the heroines of computing as historic facts to

> inspire the upcoming generation.'

Peter Barron, Head of External Relations at Google said: 'We are delighted to have hosted the Heroines of Computing event at Bletchley Park and to have sponsored this exciting new gallery at TNMOC. As a company we're committed to encouraging more young people to explore the opportunities in computing. One of the challenges faced by girls in particular is a perceived lack of role models – a problem we hope this gallery can help redress.'

Chris Monk, Learning Coordinator at TNMOC, explained how the women in computing theme will be developed at TNMOC: 'With the support of Google we have created this highly dynamic gallery which by a few keystrokes can be updated with

information and videos as they become available. At Saturday's event, for exam-

ple, we collected more of the history from the pioneers themselves and already several new videos are now being edited for display. Women's part in the history of computing will not be confined to this new Gallery -- as the Museum grows their stories will be embedded throughout the museum. We encourage anyone with information relevant to the history of women in computing to contact us at womenincomputing@tnmoc.org.'

The gallery's digital signage technology, developed by DSB, is highly intuitive with an interface familiar to anyone who uses tablet comput-

ers. Content, hosted in the cloud, can be supplied in a very wide range of com-



The afternoon soldering workshop was very popular with visitors to the Heroines in Computing Event.

mon computer file types and very attractively presented by web-based screen design software.

Besides Dame Stephanie Shirley's scrapbook, other artefacts on display include comptometers, sophisticated pre-computing calculators operated mainly by women, and memorabilia such as the first Assembly language programming book, written by Kathleen Booth, a trailblazing academic, and a personally-engraved hand

punch machine of a Miss I.P.

23

Williams who worked on the celebrated Powers-Samas tabulating machines.

Dame Stephanie Shirley presents a re-

production of the scrapbook about her

career she was presented with by employees at her company F International.



Margaret Bullen, one of the wirers of the original Colossi, with the Colossus Rebuild on the day of the gallery opening.

Guests at the *Heroines in Computing* event included many of the women who have made outstanding contributions to the development of computing were present including Sophie Wilson, co-designer of the BBC Micro and the ARM chip, Joyce Wheeler, one of the first academics to use a computer (EDSAC) for research, Mary Coombs the first female commercial programmer (using LEO), and Margaret Bullen who worked on the wiring on the original Colossus computers.

For further information visit the website at www.tnmoc.org.

http://newsletter.lms.ac.uk

No. 429 October 2013







MENTORING AFRICAN RESEARCH IN MATHEMATICS (MARM)

Call for prospective mentors

The London Mathematical Society (LMS) and the International Mathematical Union (IMU) in association with the African Mathematics Millennium Science Initiative (AMMSI) are seeking applications for grants to support mathematics and its teaching in universities in Africa. Four mentoring partnerships are to be awarded, each for a duration of two years.

The project is designed to counter the mathematics 'brain-drain' by supporting qualified mathematics professionals in situ. Continuing professional links to a centre in the developed world, professional mentoring and opportunities for periodic research travel will contribute to the possibility and relative attractiveness of contributing one's mathematical expertise at home rather than moving permanently to the developed world.

The MARM awards will focus on building infrastructure and networking in mathematics in Africa. They offer postgraduate scholarships, visiting lectureships and conference support for the benefit of advanced students and young researchers in the mathematical sciences, helping to improve research and graduate education in the longer term.

The MARM programme will support mentoring relationships between mathematicians in countries with a strong mathematical infrastructure and their African colleagues, together with their students. Its sharpest focus is on cultivating longer-term mentoring relations between individual mathematicians and students.

Thirteen mentoring relationships have previously been supported through a MARM project (funded by the Nuffield Foundation and Leverhulme Trust) in Cameroon, Ethiopia, Ghana, Ivory Coast, Kenya, Nigeria, Rwanda, Tanzania and Uganda. This further initiative aims to build on these successes and to continue to support mathematics in Africa.

We are looking for mathematicians interested in being part of these mentoring collaborations. We welcome applications from those with no prior experience of collaborating with research workers in Africa, as well as from those with existing links with African research.

Prospective mentors are asked to indicate any particular institutions (or countries) with which they would like to collaborate, although we naturally cannot make any guarantees. Alternatively, applicants may wish to make a strong case for an existing link.

We will expect a willingness to make at least one short visit to Africa and to host a short visit from Africa, as well as a commitment to a continuing mentoring responsibility.

The success of the collaborations will be evaluated by asking whether the research collaboration has:

- resulted in a mathematical publication in a research mathematics journal of international standing?
- produced an MSc or PhD thesis?
- formed the basis of an on-going research group? or
- resulted in programmatic improvements in or outside support for advanced mathematics at the host institution?

To discuss potential partnerships please contact Frank Neumann (fn8@mcs.le.ac.uk).

Further information is available and submission forms can be downloaded from the LMS website (http:// lms.ac.uk/grants/mentoring-african-research-mathematics).

Submission forms should be sent to: Katy Henderson, Council and Society Officer, The London Mathematical Society, De Morgan House, 57-58 Russell Square, London WC1B 4HS, United Kingdom. Email: marm@ Ims.ac.uk. Tel: +4420 7927 0809.

The deadline for the receipt of applications is Thursday 31 October 2013.



The London Mathematical Society Computer Science Colloquium 2013

Mathematics Research Beyond the Blackboard

Tuesday 29 October, 10.30 - 16.30

De Morgan House, 57-58 Russell Square, London, WC1B 4HS. (Nearest tube: Russell Square)



In recent years computer science has made a variety of contributions to the way mathematics research is done. These range from formal proofs of results too complex for humans to do by hand, such as the Kepler conjecture, to sophisticated computational tools such as chebfun for analysis and GAP for algebra and combinatorics, and even the use of social media to "crowdsource" proofs. The colloquium presents introductory talks, aimed at the level of interested graduate students or postdocs, for those who want to know more about these new ways of doing mathematics research, with ample scope for questions and discussion.

John Harrison (Intel Corporation) Computer proofs, where we are and where we are going

Nick Trefethen (University of Oxford) Numerical computation with functions instead of numbers

Ursula Martin (Queen Mary, University of London) Mathematical practice, crowdsourcing, and social machines

Steve Linton (University of St Andrews) Experiment and Exploration in Algebra and Combinatorics

Full abstracts and timetable for the day can be found at: http://www.lms.ac.uk/events/computer-science-day

The Computer Science Colloquium is part of an LMS initiative of activities at the interface between Mathematics and Computer Science.

To register, please contact Duncan Turton (<u>computerscience@lms.ac.uk</u>) The day is free for students and £5 for all others which is payable on the day. A sandwich lunch will be provided. Limited funds are available to help with students' travel costs. Further details are available from Duncan Turton at the Society (<u>computerscience@lms.ac.uk</u>)

http://newsletter.lms.ac.uk

FUNDAMENTALS OF COMPUTATION THEORY

Report

26

The 19th international symposium on Fundamentals of Computation Theory (FCT 2013) was held in Liverpool from 19 to 23 August 2013 supported by an LMS conference grant. This year the 29 papers (26 full papers and three invited papers) were carefully reviewed and selected from 58 submissions. The papers of authors from 23 countries covered the following topics: algorithms, formal methods, and emerging fields in theoretical computer science. The proceedings were published in the Lecture Notes in Computer Science series by Springer-Verlag, volume 8070, Leszek Gasieniec and Frank Wolter (eds.). In addition, a special issue of Theoretical Computer Science Journal (Elsevier) will include the extended versions of selected papers.

The programme included three invited talks covering different aspects of algorithmic problems and their computational complexity.

The first invited talk *Together or Separate? Algorithmic Aggregation Problems* was given by Marek Chrobak (University of California, Riverside) who mainly specializes in algorithms and data structures; theory of computation; combinatorics and graph theory. Aggregation problems arise when an expensive resource is shared by multiple agents. Shared access to this resource may result in agents incurring additional expenses, for example due to excessive wait time. This leads to a tradeoff between the frequency of access to the shared resource and the overhead costs for individual agents. The nature of the problem can be illustrated on the following basic dilemma when a group of different people are heading to an airport after a conference. Sharing a cab saves overall cost, but it may create some inconvenience, or even additional expenses, if it results in an early or late arrival at the airport. The same effects appear in more formal systems having difficult optimization problems due to frequent requests to sharing resources. Marek surveyed the existing work on efficient algorithms for such aggregation problems, attempting to provide a unified perspective and emphasizing connections between different variants. In particular he presented recently developed offline and online approximation algorithms and highlighted a number of remaining open problems.

The second invited talk was devoted to decision problems for linear recurrence sequences and was given by Joel Oaknine (Oxford University). Linear recurrence sequences permeate a vast number of areas of mathematics and computer science. However several fundamental decision problems for linear recurrence sequences, namely the Skolem Problem (does the sequence have a zero?), the Positivity Problem (is the sequence always positive?), and the Ultimate





Marek Chrobak

Joel Oaknine

David Peleg

Positivity Problem (is the sequence ultimately always positive?), remain open in general while for some low-order linear recurrence systems these problems have been proven to be decidable. The central topic of this talk was decidability and computational complexity of the above mentioned reachability

plexity of the above mentioned reachability problems. In particular the most surprising fact, presented by the speaker, is an indirect argument to highlight the difficulty of these computational problems. In particular it was shown that the decidability of either Positivity or Ultimate Positivity for integer Linear Recurrence Sequences of order 6 would entail major breakthroughs in analytic number theory, more precisely in the field of Diophantine approximation of transcendental numbers.

The third invited speaker was David Peleg (Weizmann Institute of Science, Rehovot, Israel). In 2008, he was awarded the Edsger W. Dijkstra Prize in Distributed Computing along with Baruch Awerbuch for their 1990 paper Sparse partitions. He gave a talk on Randomized Distributed Decision, where a central theme in this line of study deals with classifying problems according to their local distributed solvability and identifying the relevant parameters governing local solvability, towards establishing a computational complexity theory for locality. In this talk he considered the locality of distributed decision problems and discussed the question whether randomness helps in locally deciding distributed languages.

The invited and contributed talks in the FCT 2013 conference were beneficial for researchers of all levels and addressed many questions of significant importance bridging mathematics and theoretical computer science. The exact programme of the conference is still available at the following website http://fct2013.csc.liv.ac.uk/. Fundamentals of Computation Theory Meeting is a biennial series of conferences and the next one will take place in 2015 in Gdansk. Poland.

> Igor Potapov University of Liverpool

MATHEMATICAL MODELLING IN ECOLOGY AND EVOLUTION

Report

Doing mathematics should be exciting. With our knowledge of both the importance and complexity of living systems accelerating almost beyond imagination, rigorous and honest mathematics is needed to provide the essential unifying structures for both understanding and prediction. No excuse for a dull meeting, then.

The 4th bi-annual Mathematical Modelling in Ecology and Evolution (MMEE) meeting returned to the UK from 12 to 15 August 2013, located in the shiny new Ron Cooke Hub on York's Heslington East campus. The aim was to create an inclusive and diverse programme to showcase the latest developments of mathematical modelling in evolution and ecology. Adaptive dynamics, bifurcation theory, dynamic programming, graph theory, individual-based simulations, MCMC, network dynamics, nonlinear PDEs, numerical analysis, statistics, ... the modern mathematical biologist needs many weapons, and it was inspiring to see the crossfertilisation and mutualistic interaction at work between sub-disciplines.



Six plenary speakers exemplified both the range of problems tackled and the diversity of methods used to explore them:

- Alasdair Houston (Bristol) Natural selection and irrational behaviour
- Sonia Kefi (CNRS, Institut des Sciences de l'Evolution de Montpellier) Spatial structure

http://newsletter.lms.ac.uk

and ecosystems' resilience: insights from drylands

- Drew Purves (Microsoft Research) Modelling all life on earth. Yes, really!
- Suzanne Alonzo (Yale) The Coevolutionary and social dynamics of mating and parental Care
- Mike Brockhurst (York) Coevolution of microbial interactions: bacteria, phages and plasmids
- Richard Law (York) Of trees and fish: population dynamics for organisms that grow

The plenaries deserve credit for making their talks accessible and interdisciplinary without trivialising or disguising the mathematics, and for their willingness to engage in discussions, and arguments, afterwards.

The ubiquity and diversity of mathematics in the life sciences was emphasised by a decision to minimise the number of themed sessions – there is no need to be divisive. That said, minisymposia on *FoodWebs and Biodiversity* (chair: Axel Rossberg, Cefas) and *Search Theory in Biology* (chair: Tom Lidbetter, LSE) focused in detail on new and important developments in these two areas.

28

Student involvement and engagement is paramount, with PhD students showing their excellence in a variety of talks and posters. A successful evolutionary step from previous meetings was to "volunteer" PhD students as chairs of sessions of contributed talks. This was a real success; the virgin chairs got thoroughly involved, asked wise guestions, and ensured (or



Supporting local industry and enhancing collaboration via the canonical equation of adaptive dynamics. No LMS funds were harmed in the production of this brew.

increased the probability of) good behaviour from speakers. The efforts of a team of York UG and PG unpaid volunteers (and future mathematical biologists) were also much appreciated.

York did its best to entertain, with a familyfriendly (and grimly Scotsman-unfriendly) ghost walk, a dinner at the National Rail Museum, and time to admire the old city. Yorkshire proved that it is indeed the best place in the world, supplying perfect weather and a microbrewery willing to provide liberal and sustained tastings of *MathematicAle* and *Beer MMEE*.

The organisers gratefully acknowledge financial support from LMS, the Departments of Biology and Mathematics at the University of York, and York Centre for Complex Systems Analysis.

> Jon Pitchford University of York

BRITISH POSTGRADUATE MODEL THEORY CONFERENCE

The fourth *British Postgraduate Model Theory Conference* (BPGMT) will take place from 13 to 15 January 2014 at the University of Leeds. The organisers aim to provide a platform for postgraduate students and postdocs working in and around model theory to meet and discuss their work in a relaxed environment. All participants are encouraged to contribute a talk or bring a poster. Although the BPGMT conference is aimed at UK-based students, it is also open to those abroad.

There will be a short course given by Dugald Macpherson (Leeds) and plenary talks will be given by Paola D'aquino (Caserta, Italy), Martin Hils (Paris 7; provisional) and Françoise Point (Paris 7/Mons).

Further details are available at the conference website www.maths.leeds.ac.uk/~bpgmt2014. Everyone interested in attending this conference is encouraged to pre-register at the website. Enquiries should be addressed to pgmodeltheory@ gmail.com. This conference is funded by an LMS Scheme 8 (postgraduate research conference) grant and by the British Logic Colloquium.

wsletter@lms.ac.uk



AMERICAN MATHEMATICAL SOCIETY



30

AN INTRODUCTION TO STOCHASTIC DIFFERENTIAL EQUATIONS

Lawrence C. Evans, University of California

Provides a quick, but very readable introduction to stochastic differential equations - that is, to differential equations subject to additive "white noise" and related random disturbances. The exposition is strongly focused upon the interplay between probabilistic intuition and mathematical rigour.

"This book covers the most important elementary facts regarding stochastic differential equations; it also describes some of the applications to partial differential equations, optimal stopping, and options pricing. The book's style is intuitive rather than formal, and emphasis is made on clarity. This book will be very helpful to starting graduate students and strong undergraduates as well as to others who want to gain knowledge of stochastic differential equations. I recommend this book enthusiastically."

-Alexander Lipton, Mathematical Finance Executive, Bank of America Merrill Lynch

Dec 2013 277pp 9781470410544 Hardback £27.50



THE MATHEMATICS OF ENCRYPTION An Elementary Introduction

Margaret Cozzens, DIMACS, Rutgers University & Steven J. Miller, Williams College

How quickly can you compute the remainder when dividing 10983797 by 120143? Why would you even want to compute this? And what does this have to do with cryptography?

This book provides a historical and mathematical tour of cryptography, from classical ciphers to quantum cryptography. The authors introduce just enough mathematics to explore modern encryption methods, with nothing more than basic algebra and some elementary number theory being necessary. Complete expositions are given of the classical ciphers and the attacks on them, along with a detailed description of the famous Enigma system.

Mathematical World, Vol. 29 Oct 2013 348pp 9780821883211 Paperback £39.50

To order AMS titles visit www.eurospanbookstore.com/ams

CUSTOMER SERVICES: Tel: +44 (0)1767 604972 Fax: +44 (0)1767 601640 Email: eurospan@turpin-distribution.com FURTHER INFORMATION: Tel: +44 (0)20 7240 0856 Fax: +44 (0)20 7379 0609 Email: info@eurospangroup.com







BCS-FACS Evening Seminar Joint event with the London Mathematical Society

Tuesday 8 October 2013, 6:00pm



Professor Philippa Gardner (Imperial College London)

Views: Compositional Reasoning for Computer Programs

Mathematical reasoning has the potential to provide much needed guarantees about what computer programs do. It is important that the reasoning is compositional. Compositional reasoning means that we consider each program component (such as a program fragment, a library function or a concurrent thread) in isolation without having knowledge of the program context (such as the rest of the code, a client program using the library or the environment thread) in which it will be placed. It means that the reasoning scales and can therefore be applied to industrial code.

This talk presents a mathematical theory of views for reasoning compositionally about sequential and concurrent programs. A program's view provides abstract partial knowledge of the current state of the machine and the program's right to change that state. Views can be composed as long as their knowledge and rights do not conflict. The theory of views is simple but highly applicable; traditional concurrent reasoning methods such as rely-guarantee and Owicki-Gries, modern methods centering on separation logic, and many type theories can all be seen to fit within this theory. In this talk I will demonstrate these ideas by reasoning about simple algorithms including the Sieve of Eratosthenes, fine-grained list-locking algorithms and concurrent tree algorithms.

The venue is the London Mathematical Society, De Morgan House 57-58 Russell Square, London WC1B 4HS Refreshments will be available from 5.30pm.

The seminar is free of charge and open to everyone. If you would like to attend, please register at computerscience@lms.ac.uk.

http://newsletter.lms.ac.uk

No. 429 October 2013

FOAMS AND MINIMAL SURFACES - 12 YEARS ON

Isaac Newton Institute for Mathematical Sciences

24 - 28 February 2014

in association with the Newton Institute programme Foams and Minimal Surfaces

Workshop organisers: Simon Cox (Aberystwyth) and Denis Weaire (Trinity College Dublin).

Computational methods, 3D tomography, and high speed photography have given fresh impetus to the mathematics of minimal surfaces and its applications, and it remains a fertile area for collaborative research. In particular the theory of liquid foams, which has its roots in the work of Plateau in the 19th century, has greatly advanced since the original FMS programme in 2002.

We propose to take stock of how far research has moved since 2002, to bring open problems to a wider audience, and to explore ways in which they might be tackled by collaboration between pure mathematicians, applied mathematicians, theoretical physicists, and engineers.

Themes include:

- The Surface Evolver and its applications
- · Tiling space, sphere packings and wet foams, and conformal geometry
- · Structure and dynamics of soap films and clusters of bubbles
- · How can physics and computer science help solve the Kelvin problem?
- The effect of foam structure on dynamics and the effect of dynamics on structure

In the tradition of the Institute, the meeting will be highly informal and aimed at maximising lively interactions between participants during and outside the lecture/seminar sessions.

Closing date of the receipt of applications is **30 November 2013**. Further information and application forms are available from the website at www.newton.ac.uk/programmes/FMS/fmsw02.shtml.

VISIT OF BEN MARTIN

Dr Ben Martin (University of Auckland) will be visiting the UK from October 2013 to January 2014. Dr Martin's research area is group theory (algebraic groups, complete reducibility, representation growth of finitely generated groups). During his visit he will give talks on:

- Tuesday 1 October at 4 pm, Algebra Seminar, Manchester Representations of finite groups in reductive algebraic groups
- Friday 11 October at 2 pm, Pure Mathematics Seminar, Southampton Complete reducibility and spherical buildings
- Thursday 17 October at 10 am, Algebra Seminar, York Representation growth of finitely generated groups

- Thursday 24 October at 4 pm, Algebra Seminar, Birmingham Geometric invariant theory and spherical buildings
- Wednesday 13 November at 4:30 pm, Algebra Seminar, Cambridge The local structure of G-varieties
- Tuesday 19 November at 2 pm, Pure Mathematics Seminar, Royal Holloway, University of London G-complete reducibility for reductive algebraic groups
- Thursday 21 November, London Algebra Colloquium, City University London Maximal subgroups of simple algebraic groups
- Monday 25 November at 4 pm, Pure Mathematics Colloquium, Durham Geometric

invariant theory over arbitrary fields For further information contact Michael Bate (michael.bate@york.ac.uk). The visit is supported by an LMS Scheme 2 grant.

VISIT OF DAVID KREJČIŘÍK

Dr David Krejčiřík (Academy of Sciences of the Czech Republic, Prague) will be visiting the UK during October 2013. He works on spectral theory and application in mathematical physics. Dr Krejčiřík will give talks on:

- 17 October at 3 pm, London Analysis Seminar The semiclassical fall of non-Hermitian quantum mechanics
- 18 October at 4 pm, Reading The Brownian traveller on manifolds
- 21 October at 3.10 pm, Cardiff The Cheeger constant of curved strips

For further details contact Martin Kolb (m.kolb@reading.ac.uk). The visit is supported by an LMS Scheme 2 grant.

BRITISH MATHEMATICAL COLLOOUIUM 2014

The 66th *British Mathematical Colloquium* will take place at Queen Mary University of London from 7 to 10 April 2014. Plenary speakers are:

- Michael Atiyah (University of Edinburgh)
- Persi Diaconis (Stanford University)
- Robert Guralnick (University of Southern California)
- Ngô Bào Châu (University of Chicago)
- Endre Szemerédi (Rutgers University)
- Cédric Villani (Université Lyon 1)
- Claire Voisin (École Polytechnique)
- Don Zagier (MPIM Bonn)

In addition, there will be ten morning speakers, as well as afternoon workshops in Combinatorics, Ergodic Theory, Geometry, Group Theory and Number Theory.

The conference is supported by an LMS Conference grant and by Clay Mathematics Institute, and there will be a bursary scheme for PhD students sponsored by Google. For further information visit the conference website at www.maths.gmul.ac.uk/bmc2014.

OBITUARIES DAVID REES

Professor David Rees FRS, who was elected a member of the London Mathematical Society on 23 May 1946 and who was awarded the Society's Pólya Prize in 1993, died on 16 August 2013, aged 95.



33

Rodney Sharp writes: David's undergraduate studies during 1936-39 at Sidney Sussex College, Cambridge, were supervised by Gordon Welchman. Although David began postgraduate work, on semigroup theory, in autumn 1939, the war intervened. Gordon Welchman recruited David and other young Cambridge mathematicians to work at Bletchley Park, the British codebreaking centre, where they became part of a team that broke the Enigma code.

After the war, David was appointed to an Assistant Lectureship at Manchester University, and then, in 1948, to a University Lectureship at Cambridge and a Fellowship at Downing College. While at Manchester, and for his first years as a Cambridge fellow, he worked on semigroups and other non-commutative algebra. Rees factor semigroups and Rees matrix semigroups are named after David.

His life changed following a very successful working seminar in Cambridge, organized by Douglas Northcott, on Weil's book *Foundations of algebraic geometry*. First, David Rees was so inspired by the seminar that he became a commutative algebraist. Second, another participant in the seminar was Joan Cushen, and David and Joan were married in 1952.

In David's first paper in commutative algebra, written jointly with Douglas Northcott about 60 years ago, they introduced the concept of reduction of an ideal in a local ring. Even in this 21st century, hardly a conference on commutative algebra passes without several mentions of reductions of ideals.

David Rees left Cambridge in 1958 to take up a chair at the University of Exeter, where he re-

No. 429 October 2013

http://newslette

mained until his retirement in 1983. He carried out his duties as head of department with care and consideration. The associated administrative tasks reduced the time he had available for research, but he had a burst of research activity after his retirement.

LMS NEWSLETTER

David's fundamental work on valuations associated with local rings and ideals, and on grade, and his above-mentioned work on reductions of ideals, together with the familiar (at least for commutative algebraists) expressions 'Rees ring' and 'Artin-Rees Lemma', ensure that his legacy to commutative algebra will be lasting.

David's wife Joan survived him by just twelve days; they are survived by their daughters Mary, Rebecca, Sarah and Deborah.

JOAN REES

Dr Joan Sybil Rees, née Cushen, who was elected a member of the London Mathematical Society on 15 June 1972, died on 28 August 2013, aged 89.

David Oates, aided by Mary and Sarah Rees, writes: born to a school-teaching

family in Portsmouth on 25 August 1924 and after some war-time disruption, Joan took up a scholarship at Girton College in 1942. Taught by Mary Cartwright and Bertha Jeffreys, and the only woman to get a mathematics first for two years, she began a PhD on Algebraic Geometry with Hodge. This was completed under Dan Pedoe at Royal Holloway College, where the duties of her lectureship included playing the double bass left by the previous incumbent.

Returning to a Fellowship at Girton, she entered into a lifetime as an enthusiastic and inspiring teacher and friend, much loved by her students and colleagues. The Fellowship had to be relinquished on marriage to David Rees in 1952 and Joan continued as a supervisor between the births of the first three of their four daughters.

After their move to Exeter in 1958, she devoted herself to the needs of the family, eventually taking a post teaching at the Maynard School. In 1965 Joan began 19 years lecturing in David's Department. Here, as in everything, she was the ideal complement to David's quiet authority. Differential geometry was a particular joy to her, aided by models including a paint-stiffened pair of tights to demonstrate saddle points.

Joan was quite profoundly deaf from childhood. However, very few even noticed how heavily dependent she was on her expert lip reading. Reflections following a near-fatal attack of scarlet fever engendered a deep religious faith and a lifelong devotion to the high end of Anglicanism – 'anything a bit spiky', as she put it. After the family had left home she fulfilled a long-held ambition to convert to Roman Catholicism, subsequently taking a great interest in the local RC schools.

Joan was an accomplished watercolourist and many friends have pictures from her exhibitions decorating their walls. Having been a Cambridge blue for swimming (and lacrosse and squash), she became a great devotee of sea bathing – often in weather that would make others shudder. For many, the typical image was of a well-wrapped Joan sitting at an easel on Dawlish Warren beach in a howling gale painting happily away.

Joan was a great friend and inspiration to many, remaining her active and enthusiastic self until just the last few months.

Joan's husband David died just twelve days earlier; they are survived by their daughters Mary, Rebecca, Sarah and Deborah.

JOHN WILSON

Dr John P. Wilson, who was elected a member of the London Mathematical Society on 16 December 1964, died on 9 August 2013, aged 76.

John Dyke writes: John first worked for the Open University in the North Re-

gion in 1973 and taught on our initial mathematics foundation course, M100. He taught a range of courses there up to his departure to Bishops Castle. His contribution to both North Region and Wales were highly valued and he came with excellent recommendation to us in Wales.

In Wales, John taught the History of Mathematics Course, MA290, from 1994 up to his retirement in 2002. His tutoring was of the highest calibre and he was well liked by both staff and students. His enthusiasm and passion for the history of mathematics were passed on to many of his students. I remember talking to an arts student who had studied the history of mathematic course with John, as an arts course. He said that he had developed a great interest in mathematics, a subject he had previously feared, and would be pursuing it further in his studies.

In 2002 John told us of his illness and his intention to resign at the conclusion of the current year. We were saddened by the bad news of his illness and also at losing a valued colleague.

REVIEWS

HENRI POINCARÉ : A Scientific Biography by Jeremy Gray, Princeton University Press, 2012, 608 pp, £24.95, \$35.00 ISBN: 978-0-69-115271-4.

I sit at my desk and plan an undergraduate lecture course on the topology of surfaces. The inevitable question: can I at the same time satisfy the student for whom mathematics is nothing without rigorous proof, and also tell another what interesting things lie ahead? Poincaré said: "In becoming rigorous, mathematical science forgets its historical origins; we see

how questions can be answered, we no longer see how and why they are put." Gray's book attends to those origins in a detailed picture of the scientific life and works of this remarkable mathematician who was many times accused of lack of rigour but whose vision created many new areas of research which are active today.

The case of topology is particularly relevant because of Poincaré's foun-

dational work on the subject. Reading the book, we see him experimenting in a hands-on fashion with what we now call Heegard splittings, Morse theory, homology and the fundamental group without any of today's formal definitions. And planning my lecture I can see the problem: even now to set up this apparatus is a course in its own right and it seems unfair to defer a student's satisfaction until the following year. Poincaré too realizes the limitations of his descriptions but nevertheless is eager to communicate his results and defers the proofs to supplements, correcting and advancing on previous papers. A case in point is the Second Complément à l'Analysis Situs published in 1900 in the Proceedings of the London Mathematical Society where he rectifies an earlier result and in so doing introduces torsion in homology. He spends several pages reducing integer matrices to canonical form, (unaware that Henry Smith, a former President of the Society, had achieved this 40 years earlier) and then stops by announcing a theorem, whose proof he admits requires further development of the theory. Then, as we learn from the book, further supplements give a counterexample to his "theorem" until finally we get what became the celebrated Poincaré coniecture.

35

Topology is but one of the many themes in Poincaré's work, some of the other notable ones being the global treatment of dynamical systems, differential equations and celestial mechanics. He devoted much of his time too to physics and was even considered at one time for the Nobel Prize. This book covers the whole gamut of his works and is sliced up into sections in a rather unorthodox manner, perhaps reflecting successive lectures by the author on his subject. We be-

> gin with Poincaré the essayist (today's advocate of the public awareness of science), followed by his life, and then a succession of thematic chapters covering virtually all of his work, some in areas that this reader was unaware of. One of the features of the book is that the author attempts to give an outline of many of Poincaré's proofs and methods, without much reference to today's approaches. This may

HENRI POINCARÉ

D was f the Soci-1964, 2013, John Open



be challenging for any reader without a solid mathematical background, but it does give a good sense of the mathematics of the time. As one progresses through the book, this particular past seems far less of a foreign country.

The philosophical aspects of Poincaré's thoughts and works are, one suspects, the favourite topic of the biographer perhaps because the essays reveal them, but also because the turn of the century produced so many issues challenging the foundations of both physics and mathematics. For Poincaré mathematics could never be detached from physics : "the only natural object of mathematical thought is the integer. It is the external world that has imposed the continuum upon us, which we would have invented without doubt, but we have been forced to invent." His view on physics, faced with failed theories or undetectable phenomena like the ether, was that we could never truly understand the primitive objects, these would be forever hidden from us, but "the true relations between these real

objects are the only reality we can attain". The objects are replaced by metaphors which have a consistent mathematical meaning and aid our perception of the real world. Whether he would sleep easily nowadays with metaphorical multiverses and ten-dimensional strings is not so clear.

One wonders whether this emphasis on relations rather than objects came from his youthful encounter with group theory: stepping onto the omnibus and realizing with glee that the group of symmetries of hyperbolic space underlay his work on differential equations. An early experience could influence a lifetime's philosophy.

> Nigel Hitchin University of Oxford

GAMES AND MATHEMATICS:

Subtle Connections by David Wells, Cambridge University Press, 2012, pp 255, £14.00 pb, £45.00 hb, ISBN: 978-1-1076-9091-2.

I first encountered David Wells as an editor and contributor to Games & Puzzles Magazine when I was a subscriber, 35-40 years ago. His writing then was clear and exciting and I was eager to read his current book, Games and Mathematics.

His writing is still clear and exciting, and he has a good deal to say about mathematics and about games. He tells us of the mathematics that is and is not 'game-like', as well as games which are and are not mathematical. His approach is to show us a broad range of anecdotes and examples from game rules, game analysis, games players, mathematicians and their works in analysis, geometry, number theory and graph theory.

Wells' examples from mathematics are a pleasure to read: they are not the usual examples from popularizations but are less-known results. and he is interested in showing the reader how the original thinking of the mathematician led to the result and in how game-like the structure of the result or its proof is. The book rewards the casual reader who opens the book at random and reads the explanation of an interesting diagram. These vignettes are generally excellent, showing us something new about old facts, and showing us some completely new things.

This book also rewards the more sequential reader - it produces a developing thread concerning the game-like thinking behind many mathematical ideas. This thread is his main point in this book, and the distinctions he makes are thoughtful, often surprising. He has written a good deal, books and articles, about the links between games and mathematics, and this book is part of that series. It may be that he is so accustomed to this connection that he does not spell it out well. As a reader of just this one book of his, it seemed to me that the notion of 'gamelike mathematics' was suddenly the center of his attention without it ever having been brought to mine.

Games and Math-

ematics has a few smaller flaws as well. In the introduction, the dodecahedron in Hamilton's Icosian Game is referred to as an icosahedron. Later. an otherwise intensely clever Archimedean argument about tangent



lines to a parabola omits proof that the line OB is perpendicular to the directrix. There are a few examples of words slightly misused. One is first irked and then amused at his habit of adding spice to his narrative, like Shaw, by guoting himself.

But my comments (the margins are wide enough to contain them) are 'Nice!' and 'Coool!' many times more often than they are corrections or queries. Games and Mathematics is an imperfect but very interesting book, and I am very glad to have read it.

> Steve Wilson Northern Arizona University

ALAN TURING: HIS WORK AND IMPACT edited by S. Barry Cooper and Jan van Leeuwen, Elsevier, 2013, 944 pp, £45.99, ISBN: 978-0-123-86980-7.

In the introduction, Barry Cooper, one of the co-editors, describes this as a book you can browse on the bus or take to a distant scientific meeting. Tongue in cheek presumably, since with 914 pages and weighing in at over 2 kg it is hardly a pocket edition, more at home on a coffee table, and a substantial one at that.

In overall structure it is divided into four parts: Computability and Provability; Cryptology, Complexity and Number Theory; Intelligent Machines; Morphogenesis. So about half could be roughly classified as mathematics. Each part is built around a selection of reprints of Turing's papers and notes, published and unpublished, from North Holland's four volume Collected Works of Alan M. Turing and in turn each of these is accompanied by short contributed commentaries, most around eight pages or so, by leading figures in that area.

What they chose to focus on was apparently left up to them. So we find here a wonderful mixture ranging from the slightly bizarre square root of negation to personal Turing anecdotes (like Christos Papadimitriou's initial encounter with Turing Machines prompting him to look up the meaning of 'to ture'), to scholarly accounts of the context of Turina's work, to current research in areas which Turing was to a major extent responsible for founding. At the same time these offer a glimpse into the personalities of the contributors themselves.

Naturally this all fills one with a profound sense of Turing's visionary genius, the sheer breadth and depth of his insight and interests, a feeling only enhanced by the care and labor that the commentators have devoted to their articles. What is surprising here, at least at first sight, is that while there are often multiple commentaries on the same Turing paper there is almost no repetition or overlap. The inevitable conclusion one is led to is that Turing's papers present such a feast of ideas that there is plenty for all.

One point however which does frequently resound in these articles can be summed up by a quote from Cliff Jones' essay "The temptation to ask what might have been? is irresistible". All too often we read that Turing had intended to say more on a topic, only to frustratingly pursue a rival interest. The tragedy of his early death just short of 42 is ever in the background.

37

Since most of the contributions are directly linked to a paper of Turing's, it is clearly desirable to read, or to have read, that paper first. Fortunately Turing's papers are in most cases surprisingly approachable, in large part, as several of the contributors point out, because he is often developing ideas from the basics (with scant use of what others might have done!) using relatively simple mathematics. Nevertheless the extraordinary range of topics covered, mathematical notation, statistics, numerical algorithms, philosophy of mind, the Riemann Hypothesis, computers and computability, morphogenesis, means that few readers are likely to immediately fulfil the prerequisites for all

of them.

ALAN TURING

HIS WORK AND IMPAC

As Robin Gandy's research student in 1969 (Robin was himself Turing's lone PhD student) I had a very minor role scanning for misprints in one of Turing's less important papers for what would eventually emerge as a volume of collected works, a task which was certainly not fruitless! The fact that that collection, started by Robin and finally

http://newsletter.lms.ac.ul

No. 429 October 2013

completed by Mike Yates in 2001, took some 40 years whilst this latest compilation took just three (and almost hit the target of the 100th anniversary of Turing's birth in 1912) is to some extent a measure of how our recognition and appreciation of Alan Turing has grown over that period.

It is a rather remarkable achievement that the editors have managed to engage so many leading figures, 70 of them in all, and with such evident commitment, in this project and for the resulting tome ('volume' seems too slight a word here) to be so inexpensive at just £46. It is a fitting tribute to Turing's legacy, although surely not the very last word.

> Jeff Paris University of Manchester

THE GOLDEN TICKET: P, NP, and the Search for the Impossible by Lance Fortnow, Princeton University Press, 2013, 176 pp, £18.95, US\$26.95, ISBN: 978-0-69-115649-1.

38

The Golden Ticket is an enthusiastic exposition of the P versus NP problem, written for a nontechnical audience. The motivation for the book is explained in the dedication. The book is dedicated to the author's wife and daughters

'know what I do and why I do it'. This second aspect – why we do it – is of primary importance. While one goal of the book is to teach the nontechnical reader about the complexity classes P and NP, a much more important goal is to explain to the reader why these complexity classes actually matter and why it matters whether P=NP.

Formal definitions of P and NP are beyond the scope of the book and these concepts are introduced very gently. Indeed, in the opening pages,

NP is said to refer to 'the problems to which we would like to find the best solution'. Without giving definitions, the book proceeds through a sequence of informative examples, followed by a very informal introduction to propositional logic, satisfiability and reductions. Much of the book is written in a fictional style: algorithmic problems are introduced in the context of the fictional land of Frenemy, a place where graph problems arise without any need to define a graph, because every person is either a friend, or an enemy, of every other person. Through a consideration of the problems that arise in Frenemy, the book explores the notion of brute-force search, the existence of more intelligent efficient search algorithms, the existence of good approximation algorithms, and of course, the notion of NP-completeness and hardest problems.

After tracing the history of the P versus NP problem, both in the West and in the Soviet Union, Fortnow introduces an interesting and varied selection of related topics, including Gödel sentences, the halting problem, circuit lower bounds, public-key cryptography, quantum computing, and a cute zero-knowledge protocol for showing that a Sudoku instance is solvable. This example is very well chosen. It doesn't require any technical expertise and it is explained in a way that should be comprehensible (and interesting!) to any intelligent reader.

Chapter 2, *The Beautiful World*, portrays the author's fictional vision of the consequences which would arise from P=NP. This reviewer is sceptical of many of these, including the cure for cancer, weather predictions a year in advance, the ability to predict personality from DNA, and

the instant solution to the remaining Millennium Prize Problems (a consequence labelled 'outrageous' by Bollobás in his January review of the fictional film *The Travelling Sales*man - P vs NP). Since it is unlikely that P=NP, it is unlikely that we will ever experience 'the beautiful world', so we will probably never know whether such consequences do arise. This can now be bought from www.travellingsalesmanmovie.com.

In any case, it is excellent to have a nontechnical book about the P versus NP question. *The Golden Ticket* offers an inspiring introduction for nontechnical readers to what is surely the most important open problem in computer science.

> Leslie Ann Goldberg University of Oxford

CALENDAR OF EVENTS

This calendar lists Society meetings and other mathematical events. Further information may be obtained from the appropriate LMS *Newsletter* whose number is given in brackets. A fuller list is given on the Society's website (www.lms.ac.uk/content/calendar). Please send updates and corrections to calendar@lms.ac.uk.

OCTOBER 2013

2 Clay Research Conference, Oxford (425)
3 University of Oxford's Mathematical Institute Opening Conference (425)
4-5 Integrable Systems in Newcastle Meeting, Northumbria University (428)
8 SBCS-FACS Evening Seminar, Philippa Gardner Compositional Reasoning for Computer Programs, De Morgan House, London (429)

9 Sheffield Probability Day, Sheffield (428)
14–18 Quantum Marginals INI Workshop, Cambridge (425)

18 Categorically Cardiff: Derived Categories and Algebraic Geometry Meeting, Cardiff (428)

18-19 Lagrange Days: at CIRCM Luminy, France (428)

24 Mathematics in Defence IMA Conference, Tom Elliot Conference Centre, Qinetiq 26 C* Algebras Meeting, Aberdeen, (428) 29 Mathematics Research Beyond the Blackboard, LMS Computer Science Colloquium, London (429)

29 Oct – 1 Nov Non-Equilibrium Statistical Mechanics and the Theory of Extreme Events in Earth Science INI Workshop, Cambridge (424)

31 LMS Good Practice Scheme Workshop, De Morgan House, London (429)

NOVEMBER 2013

15 Graphs, Groups & Probability, Warwick 15 LMS Graduate Student Meeting, London

(429)

15 LMS AGM, London (429)

16 Early Career Mathematicians' IMA
Autumn Conference, University of Strathclyde, Glasgow
20 Network Coding, Partitions and Security,

Durham

29 Noncommutative Geometry, Glasgow

DECEMBER 2013

16 Interfaces between Numerical Analysis and Computational Statistics, Southampton
16 LMS South West & South Wales Regional Meeting, Swansea (428)
16-19 Categorical and Homological Methods in Hopf Algebras Workshop, Swansea (428)
17-19 Workshop on Combinatorial Physics, Cardiff
18-20 LMS Prospects in Mathematics,

Durham University (429)

JANUARY 2014

13-15 British Postgraduate Model Theory Conference, Leeds (429)
17-19 Cryptography and Coding IMA Conference, St Anne's College, Oxford
6-10 Free Boundary Problems and Related

Topics, INI, Cambridge (428) 13-17 Inference for Change-point and Related Processes INI Workshop, Cambridge (428)

FEBRUARY 2014

10-21 Higher Structures in Algebraic Analysis Winter School and Workshop, Padova, Italy (428)
24-28 Foams and Minimal Surfaces 12 Years On, INI Cambridge (429)
28 Mary Cartwright Lecture, York

MARCH 2014 31 LMS Northern Regional Meeting, Durham



LMS-FUNDED MEETINGS



Fundamentals of Computation Theory Meeting held in Liverpool from 19 to 23 August 2013 (report page 26)



Mathematical Modelling in Ecology and Evolution Meeting held in York's Heslington East campus from 12 to 15 August 2013 (report page 27)