LONDON MATHEMATICAL SOCIETY
EST. 1865

NEWSLETTER

No. 469 May 2017

MATHEMATICAL SCIENCES RESEARCH IN PARLIAMENT

Three mathematicians won medals and awards at a competition in the House of Commons on Monday 13 March 2017 for the excellence of their mathematical science research, walking away with a £3,000, £2,000 and £1,000 prize for Gold and Silver (both sponsored by the Clay Mathematics Institute), and Bronze (sponsored by the Heilbronn Institute for Mathematical Research).

Dr James Grogan from the University of Oxford, **Laura Wadkin**, from Newcastle University and **Dr Bartosz Naskrecki** from the University of Bristol, each presented research to dozens of politicians and a panel of expert judges as part of the poster competition STEM for Britain. *Cont'd on page 3.*

(l to r) Back row: Professor Jon Keating (Heilbronn Institute for Mathematical Research), Dr Stephen Benn (Royal Society of Biology), Professor Nick Woodhouse (Clay Mathematics Institute), Stephen Metcalfe MP; front row: Dr Bartosz Naskrecki, University of Bristol (Bronze Award Winner), Dr James Grogan, University of Oxford (Gold Award Winner), Laura Wadkin, Newcastle University (Silver Award Winner)

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Dr James Grogan was awarded Gold for his research on combining state-of-the-art, high resolution computer modelling and imaging in cancer research, Laura Wadkin won Silver for her research on mathematically modelling stem cell colony development and Dr Bartosz Naskrecki won Bronze for his research on the *Generalized Fermat Conjecture*.

Professor Nick Woodhouse, President of the Clay Mathematics Institute, supporters of the Gold Award and Silver Awards said: "The inclusion of mathematics in *STEM for BRITAIN* recognises the vitality and strength of the discipline in the UK and the huge part that all branches of mathematics play in underpinning science and technology."

Professor Jon Keating FRS, Chair of the Heilbronn Institute for Mathematical Research, supporters of the Bronze Award said: "As a Research Institute whose focus is on fundamental mathematics and its applications to UK national interests, and on supporting mathematical research across the country, HIMR is delighted to be associated with *STEM for BRITAIN* and offers its warmest congratulations to all of the Award winners."

This is the fourth year that the mathematical sciences has taken part in the competition and this is the first year that the competition has been run under the STEM for Britain title in recognition of the contribution of the mathematical sciences.

Sir Adrian Smith, Chair of the Council for the Mathematical Sciences (CMS), said: "The CMS is delighted that the mathematical sciences have been involved in this prestigious event once again, it is wonderful to showcase the importance of the mathematical sciences to a wider audience. It is paramount to encourage early-career research scientists, engineers, technologists and mathematicians and the *STEM for BRITAIN* event is a very effective way of doing this. We have been encouraged by the enthusiastic response from early-career researchers in the mathematical sciences and feel sure this will this continue in the future."

The Parliamentary and Scientific Committee runs the event in collaboration with the Council for the Mathematical Sciences, the Institute of Physics, The Physiological Society, the Royal Academy of Engineering, the Royal Society of Biology and the Royal Society of Chemistry; with financial support from Research Councils UK, Warwick Manufacturing Group, the Clay Mathematics Institute, the Heilbronn Institute for Mathematical Research, the Institute of Biomedical Science and the Society of Chemical Industry.

Stephen Metcalfe MP, Chair of the Parliamentary & Scientific Committee said: "This annual competition is an important date in the parliamentary calendar because it gives MPs an opportunity to speak to a wide range of the country's best young researchers. These early career engineers, mathematicians and scientists are the architects of our future and *STEM for BRITAIN* is politicians' best opportunity to meet them and understand their work."

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LONDON MATHEMATICAL SOCIETY
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LMS EDUCATION DAY 2017

Thursday 25 May, 11am – 3pm
De Morgan House, London

Teacher shortages in mathematics: how can HE mathematics departments help reverse the trend?

University mathematics departments depend on teachers to prepare their own students, and they have an important role in training future generations of mathematics teachers. To do this effectively at a national level, it is critical that colleagues from across the sector understand the current state of Initial Teacher Training and the challenges that face teacher recruitment.

The day will be split into two parts. During the morning, participants will have the opportunity to learn about the challenges of teacher recruitment and find out how a number of maths departments have attempted to encourage students to think of mathematics teaching as a career. We are delighted that Simon Singh has agreed to introduce this session. After lunch, discussion, led by Tony Gardiner, will be focused around a document being developed by the LMS education committee on this subject for which input and feedback is sought. A detailed programme, including information about invited contributors, will follow in the coming weeks.

Whilst the theme for the day may seem somewhat removed from everyday teaching and learning activity within mathematics departments in HE, we do hope to get participants from a large number of mathematics departments to participate in the event and share their experiences and ideas.

The event is free to attend and a light lunch and other refreshments will be provided.

Please register interest in attending the event by emailing education@lms.ac.uk

VOICE OF THE FUTURE 2017

The Council for Mathematical Sciences (CMS) once again nominated young mathematical scientists to take part in this year's *Voice of the Future* event. The event is an opportunity for scientists aged 16 to 35 to put their questions to an assembled panel of MPs at the House of Commons. The event, organised by the Royal Society of Biology, took place at Portcullis House on Wednesday 15 March.

This year's CMS nominated panelists were Jenny Ashcroft (University of Kent), Anna Lambert (UCL) and Ben Ludford (Efficio Consulting). Members of Parliament attending the event included the members of the House of Commons Select Committee for Science and Technology. Jo Johnson MP, Minister of State for Universities, Science, Research and Innovation and Chi Onwurah MP, Shadow Minister (Department for Business, Energy and Industrial Strategy). The event was also attended by Sir Mark Walport the Government Chief Scientific Adviser.

More information about the event is available at https://www.rsb.org.uk/news/14-news/1713-students-and-young-scientists-put-mps-in-the-hot-seat.

Anna Lambert

Ben Ludford

Jenny Ashcroft

Audience

MAKING A LITTLE GO A LONG WAY IN MATHEMATICS

The London Mathematical Society offers a wide range of grant schemes to support mathematical activities, including conferences, joint research activities, collaborative meetings and visits. The Society is particularly concerned with providing help for mathematicians (including research students) at an early stage in their careers.

The grant schemes are funded from the Society's resources received from its endowments, investments and publishing activities and are one of the primary mechanisms through which the Society achieves its central purpose, namely to 'promote and extend mathematical knowledge'.

Professor Iain Stewart, the Society's Programme Secretary, recently spoke with *Research Professional* to discuss the Society's grant schemes and the work it does in supporting mathematical scientists.

This article was first published in Research Professional's Funding Insight service (https://www.researchprofessional.com/).

Opportunity profile: Making a little go a long way in mathematics

The London Mathematical Society makes the most of its resources with a variety of small grants equally open to pure mathematicians and those working close to other disciplines. Programme secretary Iain Stewart talks to Amanda Stringfellow.

Since 1865, the London Mathematical Society has promoted the advancement and dissemination of mathematics. It publishes a portfolio of journals, awards medals and prizes and supports mathematicians at all career levels with its grants schemes.

The society awards around £400,000 a year in grants. Most are small and cover three or four-figure sums, but they are nevertheless very valuable for researchers in mathematics as they plug little gaps that other funders don't, Stewart says.

With a modest sum of money to play with, the society is focused on using its limited resources in the most effective way for UK mathematics. "It's all about getting as much bang for our buck as possible."

The society's programme committee, chaired by Stewart, awards grants three times a year: in January, May and September. The next deadline for applications to several of the society's recurring schemes is on 15 May.

Cause for celebration

Most schemes support collaboration and networking between mathematicians, both within the UK and internationally. The society's Conference Grants scheme is the largest in terms of how much applicants can request: up to £7,000 is available for travel, accommodation and subsistence expenses for speakers or research students. For the Postgraduate Research Conference Grants Scheme, up to £4,000 is available.

The society also provides funding to help mathematicians who have secured a new position at a UK university in the past two years settle into the mathematics research network. The Celebrating New Appointments scheme provides up to £600 for a meeting to honour the new appointment. The money is used for organising talks by mathematicians in the appointee's specific research area, for the benefit of students and other academics.

Other schemes that have deadlines in May cover travel and accommodation expenses. Up to £1,500 is available through the Visits to the UK scheme, which funds overseas mathematicians to lecture in at least three separate UK institutions. The Research in Pairs Grants, meanwhile, look to spur collaborative research by offering up to £1,200 for UK-based researchers to visit groups based overseas or vice-versa, and up to £600 for visits within the UK.

The International Short Visits Scheme also supports collaborative research, but with a focus on countries "where mathematicians struggle to acquire any kind of research funding, such as countries in Africa", Stewart says. Up to £3,000 is available to help with costs for mathematicians from such countries visiting the UK, while the maximum sum is set at £2,000 for UK mathematicians making the journey in the opposite direction.

Quick and painless

To apply for any of the grants, applicants need to either join the society, which has a membership fee of £70, or have a society member support their application.

Applying for the grants is designed to be a short and straightforward process, says Stewart, adding that a two-page submission and a short CV is the optimum. "Because the amounts of money are relatively small we try to make the process as light touch as possible."

Yet one of the most common mistakes that applicants make is taking the "light touch" too far and not providing sufficient details, he says. "Just asking for £1,500 to go to Canada, for example, is not enough—we need to know what you're spending the money on, what the research benefits are and what the added value will be to UK mathematics."

Explicit instructions on what to include are available on the society's website. "People often don't take the time to read the notes of guidance closely enough, which results in unnecessary mistakes," Stewart warns.

At least two members of the programme committee assess each application before each is given a ranking and their funding allocations decided.

Focus on diversity

Stewart is keen to emphasise the broad spectrum of mathematics that the grants cover, from pure to applied mathematics research right through to the interface between mathematical sciences and other subjects, such as computer science.

As an example of the type of application that can win, Stewart mentions funding for a conference at Northumbria University to explore connections between integrable systems and physics, with the goal of promoting interactions between researchers in both areas.

"Applicants often underestimate the breadth of research we can fund," he says. He encourages potential applicants to discuss their proposals informally with the grant administrator before applying, to get advice on whether their application might fit.

The programme committee would welcome more applications from women, he says, and would particularly like to see more women invited to speak at conferences.

The society has a dedicated women in mathematics committee that aims to find ways to put the brakes on the loss of women from mathematics, which has been particularly pronounced at the higher levels of research and teaching. Ultimately, Stewart says, the lack of senior female mathematicians holds back progress in the field, as many top mathematical minds do not get to fully apply their skills.

Plugging the gaps

Stewart says that a squeeze on mathematics funding—with many grants from major funders being directed towards more applied sciences—means that the society's grants are more in demand than ever.

Accordingly, a rising number of good grant proposals combined with a stationary budget has made the committee's job increasingly difficult, he says, and now "the task is to spread our money thinly but wisely and try and help people as much as we can".

Stewart—who has been an active member of the society for two decades and is in his third year as programme secretary—says that the society has previously toyed with the idea of providing much larger grants, "but we have always decided, no".

This is because the board members of the society give their time and expertise voluntarily, and to finance larger grants would mean reviewing the applications in much more detail—which the society is not structured to do. Alongside this, the society's strategy is not to cover the same ground as the research councils, Stewart says, but rather to fill funding holes in areas that might otherwise be ignored, thus providing useful low-cost ways of embarking on high-quality mathematics research.

In addition to its grants schemes, the society also awards prizes for achievements in mathematics. These include the Senior Berwick Prize for an outstanding piece of research published by the society, the Fröhlich Prize for original and innovative work, and the De Morgan Medal for contributions to mathematics. Each is worth £1,500.

GENERAL MEETING

There will be a General Meeting of the Society on Friday 30th June 2017 at 3:30 pm, to be held at a venue to be confirmed. The business shall be:

1) the appointment of Scrutineers
2) announcement of Council's recommendation for Election to Honorary Membership
3) announcement of LMS prize winners for 2017

The General Meeting will be followed by a Society meeting. It is hoped that as many members as possible will be able to attend.

Fiona Nixon
Executive Secretary

MATHEMATICS POLICY ROUND-UP

May 2017

RESEARCH

UK Research and Innovation

Professor Sir Mark Walport FRS, Chief Executive designate, UK Research and Innovation (UKRI) and Rebecca Endean, Director of Research and Innovation Reform, Department for Business, Energy and Industrial Strategy (BEIS) gave evidence recently to the House of Lords Science and Technology Select Committee. A transcript of the evidence is available at http://tinyurl.com/k9bau7o.

Consultation on the Second REF

The Council for the Mathematical Sciences (CMS) has responded to the HEFCE consultation on the second REF. The consultation is available at http://tinyurl.com/m5opbk4.

Science priorities for Brexit

Stephen Metcalfe MP, Chair of the Parliamentary and Scientific Committee has published a statement informed by advice and evidence from the research and innovation community. The statement is available at http://tinyurl.com/n7ar2td.

SCHOOLS AND COLLEGES

Gender and Participation in Mathematics and Further Mathematics

UCL Institute of Education has completed a report titled *Gender and Participation in Mathematics and Further Mathematics: Final Report for the Further Mathematics Support Programme* on five case studies conducted on behalf of the Further Mathematics Support Programme.

The report provides useful insights into how five schools/colleges have succeeded in encouraging greater proportions of girls to continue studying A-level Mathematics. Offering girls the opportunity to attempt challenging mathematics in Key Stage 4 together with flexible support, advice and guidance, helps to create a positive culture that girls can succeed in advanced mathematics. The full report is available at http://tinyurl.com/mqc6czf.

OTHER

Changes to leadership at Alan Turing Institute

The Institute announces that after successfully steering the Institute through its start-up phase, Andrew Blake stepped down as Institute Director on 31 March to focus on developing data science research. Blake will take up the post of Research Director at the Institute. The Institute's Chief Executive, Alan Wilson, will take on the responsibilities of the Institute. More information is available at https://www.turing.ac.uk/news/changes-institute-leadership/.

MPs call for fairer science reporting and policy making

A report published by the House of Commons Science and Technology Select Committee has called for new measures to ensure clearer consideration of scientific evidence in policy making, and greater backing for public dialogue and engagement with science. The Science Communication and Engagement Report recommends that:

- The government must not deliberately conflate scientific considerations with political, financial or legal matters when making policy decisions, and the Cabinet Office 'Green Book' on public consultations must make it clearer how scientific evidence is considered independently of wider matters.
- Media organisations must take greater care to avoid 'false balance', where opposing scientific views are presented with apparent equal weight even if the overwhelming majority of scientific evidence is weighted on one side. The Committee found this has been particularly evident in reporting around climate change.
- The Committee takes a dim view of the practice or organisations issuing embargoed press releases prior to the availability of fully peer reviewed journal reports, as this is impeding journalist's ability to carry out proper fact checking or to challenge the claims made.
- The government must ensure a more robust redress mechanism in cases where scientific evidence is mis-reported by the media, which is lacking in the current Leveson reforms.
- Two key programmes to promote public dialogue and engagement in policy making, Sciencewise and the National Coordinating Centre for Public Engagement should be extended including through adequate funding in the government's Industrial Strategy.

More information is available at http://tinyurl.com/jw8u2z2.

New members of ACME

The Advisory Committee on Mathematics Education (ACME) has recently announced its new members. Professor Frank Kelly, CBE FRS (Chair), Professor Martin Bridson FRS, Professor Paul Glaister (Joint Mathematical Council Representative), Dr Paul Golby CBE FREng, Professor Jeremy Hodgen, Dr Mary McAlinden, Lynne McCulre, Professor Emma McCoy and Sir David Spiegelhalter OBE FRS. Biographies of individual members will be available on the Royal Society website in due course https://royalsociety.org.

Dr John Johnston
Joint Promotion of Mathematics

MATHS, TEAMWORK AND GOOGLIES

The 2016 IMA-LMS Christopher Zeeman Medal was awarded to Rob Eastaway for excellence in the promotion of mathematics to the public. The Christopher Zeeman Lecture took place at The Royal Society on 22 March 2017 at which Rob was presented with the Christopher Zeeman Medal. The following article by Rob is based on his lecture.

I was delighted when I discovered that Professor Sir Christopher Zeeman liked googlies. Or at least, he liked mathematical googlies.

I should explain, for anyone not up with cricket terminology, that a googly is a particular type of slow delivery which spins in the opposite direction to the one that the batsman is expecting. In other words a googly is a cricketing surprise. (It was invented in 1897 by Bernard Bosanquet, father of the late ITN newsreader Reginald.)

Chris Linton, IMA President; Rob Eastaway; Simon Tavaré, LMS President

Surprises were at the heart of Zeeman's love of maths. Asked about the secret of how to get pupils engaged in maths, he once said: "You have to find a subject that is 'playable' – then you exploit the play area, and usually there's some sort of *surprise* to it".

I share Zeeman's love of mathematical googlies. It's what got me hooked in the subject in the first place, and has been the basis of much of the material that I use to engage the public with maths.

The common perception of maths is that it is a solitary activity. But, in another analogy with cricket, maths can be as much about teamwork and partnerships, in which individuals of very different abilities can combine for the greater good. Many of the most fruitful and enjoyable experiences that I have had in maths have come from partnership with others – particularly when writing books.

My first such partnership was with David Wells, with whom I compiled *The Guinness Book of Mindbenders,* a puzzle book that has long vanished into obscurity. It was David who showed me that puzzles and games are at the heart of mathematics, and that big mathematical ideas can come from very simple activities.

Take the beer mat game, for example. Two players each have a stack of beer mats, and take it in turns to put a mat on the table, with no overlapping allowed. The game ends when one player can no longer find a space to put a mat. One can imagine the geometry of working out where to place a mat getting quite involved, yet it turns out that with a simple strategy Player 1 can always win. All they need to do is place the first mat in the centre of the table. Thereafter whatever move Player 2 makes, Player 1 repeats, but diametrically across the table. If Player 2 is able to go, then Player 1 can too.

I encountered other mathematical googlies with Jeremy Wyndham, with whom I wrote the more successful book *Why Do Buses Come In Threes?* That book very nearly went by the title *How Fast Should You Run In the Rain?* and includes one of the most wonderfully useless bits of applied maths that I know. If rain is falling vertically, then you stay driest if you run as fast as possible. But if you are

of 'normal' build and the rain is angling from behind you at more than 15 degrees, you should run no faster than the horizontal component of the rain's speed.

I could add many more examples to these, from work I've done with John Haigh, Mike Askew and others.

Of course these partnerships are nothing when compared to the most famous pairing in maths, G.H. Hardy and Ramanujan. Yet one of the joys of maths is that mathematicians of all levels can often get enjoyment from the same simple mathematical puzzle.

Hardy's Team vs the Rest of the World

There is another field in which G.H. Hardy and I would have connected, for in addition to maths Hardy's other great passion was cricket. For a while he ran a cricket team, The Mathematicals. I have a photo of that team. Loitering at the back, hands in pockets, is a young man by the name of Stephen Bosanquet, later to become a notable mathematician. If the name sounds familiar, it's because he was a distant cousin of the inventor of the googly.

In cricket, as in maths, it sometimes feels as everything, and everyone, is connected.

Rob Eastaway
Director, Maths Inspiration

FRENCH MATHEMATICIAN AWARDED 2017 ABEL PRIZE

The Norwegian Academy of Science and Letters has awarded the 2017 Abel Prize to **Yves Meyer,** École Normale Supérieure Paris-Saclay, France 'for his pivotal role in the development of the mathematical theory of wavelets'.

The President of the Norwegian Academy of Science and Letters, Ole M. Sejersted, announced the winner at the Academy in Oslo on 21 March. Meyer will receive the Prize from His Majesty King Harald V at an award ceremony in Oslo on 23 May.

Yves Meyer was the visionary leader in the modern development of the mathematical theory of wavelets, at the intersection of mathematics, information technology and computational science. Wavelet analysis has been applied in a wide variety of areas including applied and computational harmonic analysis, data compression, noise reduction, medical imaging, archiving, digital cinema, deconvolution of the Hubble space telescope images, and the recent LIGO detection of gravitational waves created by the collision of two black holes.

Yves Meyer

The annual prize, which has been awarded since 2013, carries a monetary award of six million Norwegian kroner (approximately £585,000).

More information about the 2017 Abel Prize winner is available at www.abelprize.no/.

William Benter Prize in Applied Mathematics 2018

Call for NOMINATIONS

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 Mathematics, an international award.

The Prize

The Prize recognizes outstanding mathematical contributions that have had a direct and fundamental impact on scientific, business, financial, and engineering applications.

It will be awarded to a single person for a single contribution or for a body of related contributions of his/her research or for his/her lifetime achievement.

The Prize is presented every two years and the amount of the award is US$100,000.

Nominations

Nomination is open to everyone. Nominations should not be disclosed to the nominees and self-nominations will not be accepted.

A nomination should include a covering letter with justifications, the CV of the nominee, and two supporting letters. Nominations should be submitted to:

Selection Committee
c/o Liu Bie Ju Centre for Mathematical Sciences
City University of Hong Kong
Tat Chee Avenue
Kowloon
Hong Kong

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

Deadline for nominations: 30 September 2017

Presentation of Prize

The recipient of the Prize will be announced at the International Conference on Applied Mathematics 2018 to be held in summer 2018. The Prize Laureate is expected to attend the award ceremony and to present a lecture at the conference.

The Prize was set up in 2008 in honor of Mr William Benter for his dedication and generous support 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 2012 Prize went to James D Murray (Senior Scholar, Princeton University; Professor Emeritus of Mathematical Biology, University of Oxford; and Professor Emeritus of Applied Mathematics, University of Washington), the winner in 2014 was Vladimir Rokhlin (Professor of Mathematics and Arthur K. Watson Professor of Computer Science at Yale University). The winner in 2016 was Stanley Osher, Professor of Mathematics, Computer Science, Electrical Engineering, Chemical and Biomolecular Engineering at University of California (Los Angeles).

The Liu Bie Ju Centre for Mathematical Sciences was established in 1995 with the aim of supporting 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 mathematical sciences. For more information about the Prize and the Centre, please visit *http://www.cityu.edu.hk/lbj/*

LONDON MATHEMATICAL SOCIETY
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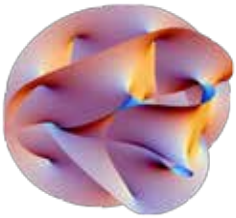
LMS POPULAR LECTURES 2017

LONDON (UCL Institute of Education)
Wednesday 28 June 19:00

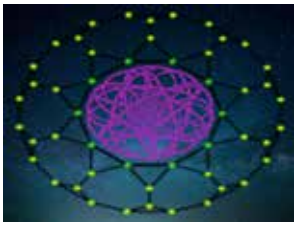
BIRMINGHAM (University of Birmingham)
Wednesday 20 September 18:30

David Tong (University of Cambridge)
The Unreasonable Effectiveness of Physics in Mathematics



For centuries there has been a close relationship between mathematics and theoretical physics. For the most part, this involved physicists gleefully using ideas previously developed by mathematicians. In the past few decades, that relationship has taken a surprising twist: in their quest to understand Nature, physicists have developed new tools, such as quantum field theory and string theory, which are providing insight into questions in pure mathematics

Jason Lotay (University College London)
Adventures in the 7th Dimension



In 7 dimensions there exist special shapes that may help us unlock the mysteries of the universe. Looking for this unique geometry is challenging, but nature holds a possible solution (specifically, bubbles and thermodynamics). This lecture will take us on a mathematical journey across multiple dimensions, exploring their role in art, science and popular culture.

LONDON: Commences at 7.00 pm, refreshments at 8.00 pm, ends at 9.30 pm. Admission is free, with ticket. Register by **Thursday 22nd June**.

BIRMINGHAM: Commences at 6.30 pm, refreshments at 7.30 pm, ends at 9.00 pm. Admission is free, with ticket. Register by **Thursday 14th September**.

You can register online at:
www.lms.ac.uk/events/popular-lectures

THE NORWEGIAN MATHEMATICAL SOCIETY

The Norwegian Mathematical Society was founded in Oslo on 2 November 1918 by Richard Birkeland, Poul Heegaard, Arnfinn Palmstrøm and Carl Størmer. During the first decades after 1900, the mathematics community in Norway grew substantially, and the Society was established with the intention of fostering contact between the nation's mathematicians. Carl Størmer was elected as the first president.

Carl Størmer, founder and first President of the Norwegian Mathematical Society

Poul Heegaard, founder of the Norwegian Mathematical Society

The Society is among the smaller ones in Europe, with a little over 300 members as of 2017. It serves as the main professional organization for mathematicians in Norway, and works to promote research, cooperation and recruitment. Its monthly newsletter, *Infomat* is freely available online at https://web.matematikkforeningen.no/publikasjoner/.

The Society's activities are aimed at mathematicians in all stages of their careers, as illustrated by the following three examples. Every year, it organizes a national competition for high school students, the Abel Competition, which also serves as the national qualification for the International Mathematical Olympiad. This is a very popular competition, and the winners usually receive their awards from the minister of education at a prize ceremony. The Society also awards Abel Scholarship Grants. These are grants awarded annually to some of the best students at the master programs in Norway, supporting shorter and longer visits to universities abroad. Finally, each year the Society organizes the Abel Symposium, a conference with distinguished international speakers.

The Norwegian Mathematical Society has reciprocity agreements with the London Mathematical Society, the American Mathematical Society, and the European Mathematical Society.

For more information about our Society, visit our website at https://web.matematikkforeningen.no/

Petter Andreas Bergh
President
Norwegian Mathematical Society

EUROPEAN NEWS

Ludwig Faddeev

Professor Ludwig Faddeev of the Steklov Institute of Mathematics in Moscow passed away on 26 February 2017. Renowned mathematical physicist and President of the International Mathematical Union 1987–1990, he was awarded the Poincaré Prize in 2006 and the Shaw Prize in 2008.

Brouwer Medal

The Royal Dutch Mathematical Society (KWG) has awarded the 2017 Brouwer Medal to Professor Kenneth A. Ribet (University of California, Berkeley) for "his contributions to number theory, in particular for the ground-breaking work in which he applies methods of algebraic geometry to

number theoretical problems". See www.wiskgenoot.nl .

Igor Shafarevich
Professor Igor Shafarevich, prominent Russian mathematician in the areas of algebraic number theory and algebraic geometry, passed away on 19 February 2017 in Moscow, at the age of 93.

ICM2018 Open Arms
For the ICM 2018 in Rio de Janeiro (Brazil) the organizers have announced the *ICM2018 Open Arms Program* that will grant 550 travel awards, 200 of which are for mathematicians working in countries in Latin America other than Brazil. The program is sponsored by IMPA (Instituto Nacional de Matemática Pura e Aplicada), the Brazilian Mathematical Society and the International Mathematical Union. Applications to the program will be open from 15 April to 20 July 2017. Further details can be found at www.icm2018.org/portal/en/news28 .

David Chillingworth
LMS/EMS Correspondent

YOUNG GEOMETRIC GROUP THEORY MEETING

Report

The sixth *Young Geometric Group Theory* (YGGT) Meeting was organised by Aditi Kar, John Mackay and Anne Thomas at the Mathematical Institute, Oxford from 20 to 24 March 2017. YGGT is an annual event in the group theorists' calendar. Past meetings were in Poland, Israel, France, Belgium and Germany. This year, the meeting was an enormous success and attracted more than 150 delegates from the UK, Europe, Asia, Russia and North America.

Geometric Group Theory, a rapidly growing field of mathematics, encompasses diverse fields of algebra and geometry. The meeting brought world-leading Geometric Group Theorists together with doctoral students and young researchers through lectures and open discussions on fundamental topics and recent breakthroughs. Professor Martin Bridson, FRS, Chairman of the Mathematical Institute, Oxford, opened the meeting on the morning of 20 March. The week-long programme featured four mini-courses, seven plenary talks, discussions and poster sessions.

Emmanuel Breuillard spoke about Approximate Groups in his mini-course, detailing the structure theorems and describing how this theory has been used to give another proof of Gromov's Polynomial Growth Theorem and study expander families in Cayley graphs of groups. Goulnara Arzhantseva's course on Non-C*-exact Groups described the technically challenging constructions of 'Monster Groups', so-called as they are rare and involve intricacies of group theory and C*-algebras. Marc Burger's mini-course introduced the recent study of geometric structures, coming from representation varieties of fundamental groups of surfaces, and dwelt on representations of these groups over real closed fields. The fourth mini-course, by Alan Reid, built on the theory of Profinite Groups and its applications to low-dimensional topology.

A typical day concluded with discussion sessions when attendees could request further explanations on mini-courses and research talks. This special aspect of YGGT creates an atmosphere of enquiry and learning and is the hallmark of these meetings. The two Poster Sessions provided young people with the opportunity to showcase their research and 25 presenters were chosen from amongst more than a hundred applicants.

YGGT was organised in partnership with Clay Mathematical Institute, London Mathematical Society, Heilbronn Institute, University of Oxford and Royal Holloway University of London. Future YGGT meetings are planned in Switzerland (2018), Spain (2019) and France (2020).

Aditi Kar
Royal Holloway, University of London

LONDON MATHEMATICAL SOCIETY
EST. 1865

LMS Mary Cartwright Lecture
Friday 5 May 2017

De Morgan House, 57-58 Russell Square, London, WC1B 4HS

3.30 **Opening Lecture**

Sinead English (University of Cambridge)

Information use within and across generations: implications for understanding animal development and non-genetic inheritance

4.30 **Tea**

5.00 **Mary Cartwright Lecture**

Rebecca Hoyle (University of Southampton)

Transgenerational plasticity and environmental change

6.00 **Wine reception**

Rebecca Hoyle

To register please contact Katy Henderson on womeninmaths@lms.ac.uk by Wednesday 3 May
The reception will be followed by dinner at the Montague Hotel, at a cost of £35 per person

LONDON MATHEMATICAL SOCIETY
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GRESHAM COLLEGE

THE LONDON MATHEMATICAL SOCIETY
JOINTLY WITH GRESHAM COLLEGE

Tuesday, 23 May 2017

6:00pm at The Museum of London

Mathematics Can Make You Fly?

Dr Carola-Bibiane Schönlieb

University of Cambridge

Well, not quite. But it can make you seem to be flying, virtually. Some of the mathematical principles that can be used for creating such an effect will be discussed, with a focus on partial differential equations used for such a virtual image manipulation or restoration task. After lifting the mystery on the flying mathematician, we will see that such principles can be used beyond special effects, in the reconstruction of crucial information in satellite images of our earth, restoration of MR images in molecular imaging to the renovation of digital photographs and medieval artwork.

ADMISSION FREE

NO RESERVATIONS REQUIRED – FIRST COME, FIRST SERVED

Museum of London, London Wall, London EC2Y 5HN
Nearest underground stations: Barbican, St Paul's, and Moorgate

020 7831 0575 enquiries@gresham.ac.uk www.gresham.ac.uk

LONDON MATHEMATICAL SOCIETY
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LMS NORTHERN REGIONAL MEETING

University of York
1 June 2017

2.00 pm	Opening of the meeting Fran Burstall (University of Bath) *Conformal submanifold theory for beginners*
3.20 pm	Marta Mazzocco (University of Loughborough) *Colliding holes in Riemann surfaces*
4.20 pm	Tea/Coffee
5.00 pm	Dominic Joyce (University of Oxford) *What is a derived manifold?*

The meeting will be followed by a wine reception in the Mathematics Department and dinner at a venue to be confirmed.

These lectures are aimed at a general mathematical audience.

All interested, whether LMS members or not, are most welcome to attend this event.

The meeting forms part of a workshop on ***Variational Methods in Submanifold Theory,*** 30 May – 2 June 2017. For further details, visit: https://www.york.ac.uk/maths/events/2017/lms-workshop-on-variational-methods-in-submanifold/ or contact the organisers, Ian McIntosh (York): ian.mcintosh@york.ac.uk and Katrin Leschke (Leicester): k.leschke@leicester.ac.uk

The deadline for registration for both the meeting and the workshop is **12 noon on Thursday 18 May.**

There are funds available to contribute in part to the expenses of members of the Society or research students to attend the meeting and workshop. Requests for support, including an estimate of expenses, may be addressed to the organisers.

For further details and to register and to reserve a place at the dinner, please visit: https://www.york.ac.uk/maths/events/2017/lms-northern-regional-society-meeting-2017/. The cost of the dinner will be approximately £20, including drinks.

New Zealand Mathematical Society

LONDON MATHEMATICAL SOCIETY EST. 1865

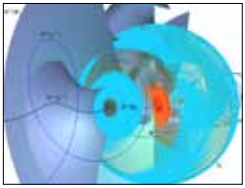
LMS – NZMS AITKEN UK LECTURE TOUR 2017

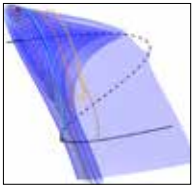
The Society is delighted to announce that the 2017 LMS-NZMS Aitken Lecturer is Professor Hinke Osinga FRSNZ (University of Auckland).

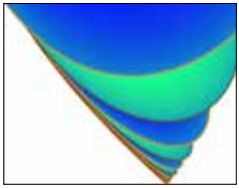
Hinke Osinga, Professor of Applied Mathematics at the University of Auckland in New Zealand, is the fourth Aitken Lecturer to visit the UK. She is an expert in dynamical systems and its applications. Her publications, illustrations, animations and outreach activities have made her famous worldwide in the mathematics and arts communities.

In 2017, there will be two Aitken Lecture Tours taking place. In May 2017, Professor Osinga will visit Bath, Cambridge, Exeter and Oxford. She will then return to in October 2017 to visit Bristol, Kent, Newcastle and Warwick.

She will give lectures on "Chaos and wild chaos in Lorenz-type systems," "The art of computing global manifolds," and "Shaken but not stirred: Using mathematics in earthquakes."







The Aitken Lectureship scheme is part of Forder-Aitken Lectureship exchange, which is a collaboration between the London Mathematical Society and the New Zealand Mathematical Society. Each Society invites an eminent mathematician from the other country to give lectures at different universities around the country.

The Aitken Lectureship, named after Professor A. Aitken - one of New Zealand's great mathematicians, is a Lecture Tour around the UK undertaken by a mathematician from New Zealand. The Forder Lectureship, named after Professor H. G. Forder (formerly of the University of Auckland and a benefactor of the London Mathematical Society) is a Lecture Tour around New Zealand undertaken by a mathematician from the UK. For further details about the Aitken Lectureship, please visit https://www.lms.ac.uk/events/lectures/forder-and-aitken-lectureship#Aitken

EARLY CAREER TOPOLOGY RESEARCHERS IN CONFERENCE

A two-day conference primarily aimed at postgraduate students and post-docs working in all areas of topology will take place in Sheffield on 15 and 16 June 2017. This follows on from its predecessor, ECSTATIC, this year under a new name, EL:ECTRIC (Ecstatic Lectures: Early Career Topology Researchers in Conference). The Invited Speakers are:

- Jelena Grbić (Southampton)
- Richard Hepworth (Aberdeen)

with the rest of the talks being given by participants. The meeting is open to all, for more information visit http://electric-conference.postgrad.shef.ac.uk/. The conference is supported by an LMS Postgraduate Research Conference grant (Scheme 8).

GÉOMÉTRIE ALGÉBRIQUE EN LIBERTÉ

Géométrie Algébrique en Liberté, also known as GAeL, is a European annual workshop organized by and for young algebraic geometers. The aim is to gather young mathematicians in this field of research and give them an opportunity to discuss freely without concerns that their questions or viewpoints might be wrong: hence the name of the workshop.

The first thirteen editions of GAeL took place at the Centre International de Rencontres Mathématiques in Marseille. Since then GAeL has been a travelling workshop. It has been successively to Poznan, Istanbul, Madrid, Leiden, Coimbra, Berlin, Grenoble, Stockholm, Trieste, Leuven and Izmir, and is now coming to Britain for the first time for its twenty-fifth edition. This also forms part of the 50th anniversary celebrations of the University of Bath.

GAeL XXV will take place at the University of Bath from Monday 26 to Friday 30 June 2017. It will feature three mini courses by senior mathematicians, lecturing about modern areas of algebraic geometry:

- Arend Bayer (University of Edinburgh) *Stability conditions and classical algebraic geometry*
- Angela Gibney (University of Georgia) *Vector bundles of conformal blocks on the moduli space of curves*
- Alessandra Sarti (Université de Poitiers) *Hyperkähler manifolds*

There will also be talks by participants and a poster session where all the participants will present their work.

Applications for funding are already closed, but for information contact the organisers at info@gael-math.org or see the webpage www.gael-math.org. The conference is supported by an LMS Postgraduate Research Conference grant (Scheme 8).

POSTGRADUATE GROUP THEORY CONFERENCE

The *Postgraduate Group Theory Conference* is an annual conference organized by PhD students for PhD students in group theory and related areas to share their research in a relaxed and enjoyable atmosphere. The conference aims to give as many postgraduate researchers as possible the opportunity to present their work in a short talk, and to facilitate exchange among young researchers.

The 19th *Postgraduate Group Theory Conference* will take place at the Centre for Mathematical Sciences, University of Cambridge, from 27 to 30 June 2017. The opening and closing talks will be given by Nadia Mazza (Lancaster University, UK) and Dr Gunter Malle (TU Kaiserslautern, Germany).

For further information visit the homepage http://swcl2.user.srcf.net/pgtc/. Any queries can be directed at the organizers via email pgtc2017@gmail.com or facebook https://www.facebook.com/pgtc2017/. The confer-

ence is supported by an LMS Postgraduate Research Conference grant (Scheme 8) and the Heilbronn Institute.

YOUNG RESEARCHERS IN MATHEMATICS

Young Researchers in Mathematics (YRM) is the UK's largest annual mathematics conference run for postgraduates, by postgraduates, and this year it is being held at the University of Kent, Canterbury (situated just an hour from London), from Tuesday 1 to Friday 4 August 2017. There will be keynote talks from distinguished academics in diverse areas of mathematics, including algebra, functional analysis, mathematical physics, number theory, integrable systems, mathematical modelling, group theory, geometry and topology. As well as the plenary and keynote talks, there will be a public talk given by Professor Paul Sutcliffe (Durham) and several workshops. The plenary talks will be given by:

- Elizabeth Mansfield (Kent)
- Martina Balagovic (Newcastle)
- Keith Ball (Warwick)

All research postgraduate students, PhD students and postdocs within any mathematics discipline are encouraged to attend. Every attendee can contribute a 20 minute talk on their research and/or participate in the poster competition in the relaxed atmosphere of the conference.

The registration fee is £60 and includes refreshments at the breaks, lunch every day, and the conference dinner. Thanks to the LMS the organisers are offering a two-for-one deal for any postgraduate who attends both the YRM 2017 and the British Mathematical Colloquium in Durham. Participants of both conferences will have their BMC registration fee reimbursed. For more information on this, as well as speakers, scheduling and how to register, visit the website at youngresearchersinmathematics.co.uk.

The conference is generously supported by an LMS Postgraduate Research Conference grant (Scheme 8) and a "two-for-one" supplementary grant. The Heilbronn Institute, EMS, NAG, SIAM-UKIE, Maple, ThinkTank Maths and Kent Graduate School are sponsors of the event.

COLLOQUIA IN COMBINATORICS 2017

The 11th two linked one-day *Colloquia in Combinatorics* will be taking place in London. The first day will be held at Queen Mary, University of London, on Wednesday 10 May; the second will take place at the London School of Economics and Political Science on Thursday 11 May. It is hoped that the talks will be of wide interest to all those working in combinatorics or related fields. The schedule is as follows:

Queen Mary, University of London
10 May – 10.30 am with coffee from 10 am
Fogg Lecture Theatre, G.E. Fogg Building

- Sophie Huczynska (St Andrews)
- Tibor Jordán (Budapest)
- Kitty Meeks (Glasgow)
- Oliver Riordan (Oxford)
- Andrew Treglown (Birmingham)
- Uli Wagner (Klosterneuburg)

London School of Economics
11 May – 10.30 am with coffee from 10 am
Sheikh Zayed Theatre, New Academic Building

- Agelos Georgakopoulos (Coventry)
- Shoham Letzter (Zürich)
- Dömötör Pálvölgyi (Cambridge)
- Guillem Perarnau (Birmingham)
- Ronitt Rubinfeld (Cambridge, USA)
- Asaf Shapira (Tel-Aviv)

Anyone interested is welcome to attend. Funds are available to contribute to the expenses of UK-based research students to attend the meetings. Further details can be obtained from tiny.cc/Colloquia or from Rebecca Lumb (r.c.lumb@lse.ac.uk).

There are also some funds available from the London Mathematical Society for help with childcare costs. Further details can be found on their website www.lms.ac.uk/content/childcare-supplementary-grants. Support for

this event from the London Mathematical Society and the British Combinatorial Committee is gratefully acknowledged by the organisers.

LEVY PROCESSES AND ANOMALOUS DIFFUSION

A one-day meeting on *Levy Processes and Anomalous Diffusion* will take place on Monday 26 June 2017 in the School of Mathematics at the University of Manchester. The meeting aims to bring together researchers and PhD students working on the theory and applications of Lévy processes and related applications of fractional Laplacian and anomalous diffusion. The speakers are:

- Pedro Aceves Sanchez (Imperial)
- Sergei Fedotov (Manchester)
- Christina Goldschmidt (Oxford)
- Yanghong Huang (Manchester)
- Andreas Kyprianou (Bath)
- Sara Merino-Aceituno (Imperial)
- Alex Watson (Manchester)

Details about the conference can be found at http://man.ac.uk/54NRzo. There is a limited amount of funds available to cover travel expenses of UK-based research students. Email alex.watson@manchester.ac.uk for further details. The meeting is supported by an LMS Conference grant and a grant from the Manchester Institute for Mathematical Sciences.

BOND-NODE STRUCTURES

The analysis of the rigidity and flexibility of bond-node structures and skeletal frameworks may be traced back to Cauchy and Euler and their considerations of polyhedra with hinged faces. In more recent times bond-node frameworks have played a vital role in mathematical models for crystals and materials, with framework bars representing strong bonds between particular atoms or between rigid polyhedral units. In particular, material zeolites provide diverse periodic networks of corner-linked regular tetrahedra, with striking geometric and topological structure.

Lancaster University will host a workshop on *Bond-Node Structures: Rigidity, Combinatorics and Materials Science* from 7 to 9 June 2017. The aim is to bring together researchers working on the theory and applications of bond-node structures. The Invited Speakers are:

- Miranda Holmes-Cerfon (Courant Institute, NYU)
- Tibor Jordan (Eötvös Loránd University)
- Meera Sitharam (University of Florida)
- Vincenzo Vitelli (Leiden University)

Details about the workshop can be found at www.lancaster.ac.uk/maths/bond-node-structures/. There is a limited amount of funds available to cover accommodation costs for UK based research students who wish to attend the meeting. The workshop is supported by an LMS Conference grant, as well as grants from the EPSRC and the Department of Mathematics and Statistics, Lancaster University.

COMBINATORIAL TECHNIQUES IN ANALYSIS AND PROBABILITY

A one-day meeting on *Combinatorial Techniques in Analysis and Probability* will be held at Lancaster University on Thursday 1 June 2017. The focus is on operator systems, noncommutative probability, q-series, and permutation statistics. The meeting seeks to showcase and further develop the rich interplay between these areas. The speakers are:

- Natasha Blitvić (Lancaster University)
- Ying-Fen Lin (Queen's University Belfast)
- Einar Steingrímsson (University of Strathclyde)

Participation by research students is particularly encouraged, with an opportunity to contribute a short talk or a poster. For registration and enquiries email: probability@lancaster.ac.uk. The meeting is supported by an LMS Conference grant.

COMBINATORICS AT OXFORD

A one-day meeting in Combinatorics will be held at the Mathematical Institute, Oxford on Wednesday 24 May 2017. The talks start at 11 am and coffee available beforehand from 10.30 am. This year's speakers are:

- Christina Goldschmidt (Oxford)
- Daniela Kuhn (Birmingham)
- Bruce Reed (CNRS/McGill)
- Paul Seymour (Princeton)
- David Wood (Monash)

Anyone interested is welcome to attend. Some funds may be available to contribute to the expenses of research students who wish to attend the meeting. Further details can be obtained from the webpage at http://people.maths.ox.ac.uk/scott/Pages/one-day_meeting.htm. The meeting is supported by an LMS Conference grant and the British Combinatorial Committee.

COMPUTATIONAL IMAGING

The Heriot-Watt workshop on *New Mathematical Methods in Computational Imaging* will be held on Thursday 29 June 2017 at Heriot-Watt University, Edinburgh. The aim of this meeting is to gather an interdisciplinary group of leading imaging experts from the applied analysis, Bayesian statistics, and signal processing communities to discuss recent breakthroughs in mathematical methodology for inverse problems related to computational imaging. The goals are to provide an opportunity to disseminate new results and to promote synergy and cross-fertilisation of ideas. The speakers are:

- Mike Davies (University of Edinburgh)
- Marcelo Pereyra (Heriot-Watt)
- Joao Mota (Heriot-Watt)
- Yoann Altmann (Heriot-Watt)

The workshop is organised by Marcelo Pereyra (Heriot-Watt). For more information, to propose a poster presentation, and to register visit the workshop website at www.macs.hw.ac.uk/~mp71/LMS_workshop_June2017.html. The meeting is supported by an LMS Conference grant, the School of Mathematical and Computer Sciences, and the School of Engineering and Physical Sciences of Heriot-Watt University.

INVARIANT THEORY

A one day meeting on *Invariant Theory: Recent Progress and Applications* will take place on Friday 16 June 2017 at Middlesex University, Hendon. The meeting aims to bring together researchers in invariant theory and researchers in other areas of algebra and geometry in which invariant theory can be applied. The following have agreed to speak:

- Emilie Dufresne (Nottingham)
- Jonathan Elmer (Middlesex)
- R.J. Shank (Kent)

There is a limited amount of funding available to cover travel and accommodation expenses for PhD students. For further information visit www.maths.mdx.ac.uk/people/dr-jonathan-elmer/itrpa/. The meeting is supported by an LMS Celebrating New Appointments Scheme 1 grant.

NUMERICAL ANALYSIS OF PDES

A three day conference, *Recent Advances in the Numerical Analysis of PDEs,* to celebrate the 65th birthday of Professor Ivan Graham will be held at the University of Bath from 21 to 23 June 2017.

Invited speakers are: Kendal Atkinson, Simon Chandler-Wilde, Victor Dominguez, Martin Gander, Mahadevan Ganesh, Wolfgang Hackbusch, Tom Hou, Frances Kuo, Victorita Dolean Maini, Jens Markus Melenk, Ilaria Perugia, Christoph Schwab, Ian Sloan, Valery Smyshlyaev, Nicole Spillane, Elisabeth Ullmann.

The meeting will take place the week before the 27th Biennial Conference on Numerical Analysis in Strathclyde.

For full details and in order to register, please visit the conference website https://sites.google.com/site/napdebath/. The conference is supported by an LMS Conference grant and the Bath Institute for Mathematical Innovation.

COMPRESSIVE SENSING

The *One Day on Compressive Sensing* workshop will take place on Thursday 1 June 2017 at the Department of Mathematical Sciences, University of Bath. The workshop aims at giving the participants a common understanding of Compressive Sensing, together with an overview of its most recent developments in theory, algorithms, and applications. The atmosphere will be extremely welcoming, interdisciplinary, and collaborative. The speakers are:

- Marta Betcke (UCL)
- Thomas Blumensath (Southampton)
- Xiaohao Cai (UCL)
- Silvia Gazzola (Bath)
- Yves van Gennip (Nottingham)
- Clarice Poon (Cambridge)
- Jared Tanner (Oxford)

Limited financial support is available for UK-based early career researchers. Details about the conference (including deadline for registration) can be found at www.bath.ac.uk/imi/events/compressive-sensing.html. For any query email imi-events@bath.ac.uk. The workshop is supported by an LMS Conference grant and by the Bath Institute for Mathematical Innovation.

INTEGRABLE MODELS, CONFORMAL FIELD THEORY

The 21st edition of the *Integrable Models, Conformal Field Theory and Related Topics* (ICFT) series will take place from 2 to 3 June 2017 at the School of Mathematics, University of Leeds. The meetings have been running every year since 1997 and aim at bringing together UK and international researchers to report state of the art results and further develop the area of quantum integrable systems, conformal field theory and related topics. A special emphasis is put on giving the opportunity to young researchers to present their work. It is the first time in the history of the series that the meeting takes place in Leeds. The following invited plenary speakers have agreed to give keynote lectures:

- Daniela Cadamuro (Technische Universität München)
- Luigi Cantini (Université de Cergy-Pontoise)
- Anatoly Konechny (Heriot-Watt University)
- Oleg Lisovyy (Université de Tours)

The local organisers of the ICFT meeting 2017 are Vincent Caudrelier and Oleg Chalykh (University of Leeds, School of Mathematics). For more information email v.caudrelier@leeds.ac.uk or visit https://conferences.leeds.ac.uk/icft2017/. Some financial support is available for UK based research students. The meeting is partly supported by an LMS Conference grant.

GROUPS ST ANDREWS 2017

This conference, the tenth in the series of *Groups St Andrews* conferences, will be held in Birmingham from Saturday 5 to Sunday 13 August 2017. The talks will take place from 6 to 12 August inclusive. The conference will be organised along similar lines to previous events in this series. Its aim is to cover all aspects of group theory. The short lecture courses are intended to be accessible to postgraduate students, postdoctoral fellows, and researchers in all areas of group theory.

Main Speakers:

- Michael Aschbacher (California Institute of Technology)
- Radha Kessar (City, University of London)
- Pierre-Emmanuel Caprace (Université Catholique de Louvain)
- Gunter Malle (TU Kaiserslautern)

Plenary Speakers:

- Tim Burness (University of Bristol)
- Vincent Guirardel (Universite de Rennes 1)
- Harald Helfgott (University of Göttingen)
- Andrei Jaikin-Zapirain (Universidad Autonoma de Madrid)
- Donna Testerman (École Polytechnique Fédérale de Lausanne)

Conference organisers are: Colin Campbell, Chris Parker, Martyn Quick, Edmund Robertson and Colva Roney-Dougal. The conference website is available at http://www.groupsstandrews.org/2017/index.shtml. Those interested in attending the conference are encouraged to register on the website to receive further updates. The conference is supported by an LMS Conference grant.

SCOTTISH PARTIAL DIFFERENTIAL EQUATION COLLOQUIUM

The fifth *Scottish Partial Differential Equation Colloquium* will take place from 8 to 9 June 2017 at the University of St Andrews. This meeting follows in the tradition of the previous four colloquia with the goal being to provide a forum for young mathematicians based in Scotland whose research involves partial differential equations to present their work and to interact with leading experts in the field. There will be five keynote lectures given by the following national and international plenary speakers:

- Andrea Bertozzi (University of California)
- Charles Elliott (University of Warwick)
- Beatrice Pelloni (Heriot-Watt University)
- Benoît Perthame (Université Pierre et Marie Curie)
- Juan Luis Vázquez (Universidad Autónoma de Madrid)

The organisers of this colloquium are Tommaso Lorenzi (tl47@st-andrews.ac.uk) and Chandrasekhar Venkataraman (cv28@st-andrews.ac.uk). The website of the colloquium will soon be available at the address (http://www.mcs.st-andrews.ac.uk/~spdec2017/). The Colloquium is partially supported by an LMS Conference grant.

CLAY RESEARCH CONFERENCE AND WORKSHOPS

The 2017 Clay Research Conference will be held on 27 September at the Mathematical Institute of the University of Oxford. The plenary speakers are:

- Larry Guth (Massachusetts Institute of Technology)
- Ovidiu Savin (Columbia University)
- Bertrand Toën (Université de Toulouse)
- Tamar Ziegler (Hebrew University of Jerusalem)

Associated workshops will be held throughout the week of the conference from 24 to 29 September:

- *Ergodic Theory: Numbers, Fractals, and Geometry* (Manfred Einsiedler, Tom Ward, Tamar Ziegler)
- *Harmonic Analysis and Related Areas* (Larry Guth, Nets Katz)
- *Modern Moduli Theory* (Dominic Joyce, Kevin McGerty, Balázs Szendrői)
- *Nonlocal PDEs* (Luis Caffarelli, Ovidiu Savin)

Registration for the Clay Research Conference is free but required. Participation in the workshops is by invitation; a limited number of additional places is available. Limited accommodation is available for PhD students and early career researchers. To register for the conference and to register interest in a workshop, email Naomi Kraker (admin@claymath.org). For full details, including the schedule, titles and abstracts when they become available see www.claymath.org.

LONDON CRYPTO DAY

The first *London Crypto Day* will take place on Monday 5 June 2017 in the Moore Auditorium of Royal Holloway, University of London. The event aims at attracting and bringing together the many talented researchers in cryptography in the area, and at helping create fruitful collaborations. The speakers include:

- Martin Albrecht (RHUL)
- Liqun Chen (University of Surrey)
- Jens Groth (UCL)
- Aggelos Kiayias (University of Edinburgh)
- Markulf Kohlweiss (Microsoft Research Cambridge)
- Maura Paterson (Birkbeck)

The organisers are Dr Elizabeth Quaglia and Professor Kenny Paterson, from the Information Security Group of Royal Holloway, University of London. For more information visit https://londoncryptoday.wordpress.com. The event is supported by an LMS Conference grant and the Royal Holloway Academic Centre of Excellence in Cyber Security.

FUNCTOR CATEGORIES FOR GROUPS

Cohomology of Functor Categories for Infinite Discrete Groups is the first meeting of the Research Group Functor Categories for Groups (FCG). The meeting will focus on applications of functor cohomology and cohomology in categories to the study of infinite discrete groups focusing in particular on recent applications to homological stability and connections with equivariant stable homotopy theory, finiteness properties of groups, Mackey functors and Bredon cohomology.

The meeting open to all, will take place at the National University of Ireland in Galway on the afternoon of Thursday 18 May 2017, with one hour lectures starting at 2 pm. The speakers include Conchita Martinez-Perez (Zaragoza) and Markus Szymik (Trondheim).

The FCG Research Group is supported by an LMS Joint Research Groups in the UK Scheme 3 grant, bringing together group theorists from Lancaster, Royal Holloway and Galway. Limited funding is available for PhD students, allocated on a first come first served basis. In addition, the LMS administers a Childcare Supplementary Grant Scheme. Further information about this scheme can be found on the LMS website: www.lms.ac.uk/content/childcare-supplementary-grants.

Further details about the meeting are available at www.lancaster.ac.uk/maths/fcg/. To register for the event, please email the local organiser Dr Dieter Degrijse (dieter.degrijse@nuigalway.ie).

Isaac Newton Institute for Mathematical Sciences

FORM AND DEFORMATION IN SOLID AND FLUID MECHANICS

18 – 22 September 2017

in association with the Isaac Newton Institute programme
Growth form and self-organisation
(22 August - 20 December 2017)

This workshop will focus on fluid and solid mechanics systems whose dynamics governs growth and determines form. Over the last decade, the field of soft condensed matter physics has paid a growing attention to problems involving solid mechanics, from crumpling of sheets to bending of leaves, and to the physical coupling between solid deformation and fluid stresses. Such problems have proven mathematically and computationally challenging, in artificial settings (dynamics of flexible microfluidic valves) and in biophysical contexts (dynamics and rheology of lipid bilayer membranes). We will thus aim to discuss new problems in fluid and solid mechanics, and will focus on those that depend on both. Reflecting the spirit of D'Arcy Thompson's approach, many of these problems start from experimental observations in the biological world, e.g. the dynamics of the cytoskeleton in crawling cells, or the dynamical rearrangements of flagella in swimming bacteria.

Further information available from the website
www.newton.ac.uk/event/gfsw01

Closing date for receipt of applications: 16 June 2017

LONDON MATHEMATICAL SOCIETY
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LMS Midlands Regional Meeting and Workshop

Modern Geometry and Physics

18 September 2017
Loughborough University

The LMS Midlands Regional Meeting will take place at Loughborough University on Monday, September 18th, 2017.

The speakers are:

- Giovanni Felder (ETH, Zurich)
- Nigel Hitchin (Oxford)
- Nikita Nekrasov (Simons Center, Stony Brook).

The meeting will be followed by a three-day workshop on *Modern Geometry and Physics*, September 19-21. The speakers include Barbara Bolognese (Sheffield), Andrea Brini (Imperial), Leonid Chekhov (Moscow), Fiorenza Domenico (Rome), Boris Dubrovin (Trieste), Vladimir Fock (Strasbourg), Lotte Hollands (Heriot-Watt), Marina Logares (Plymouth) and Elisa Postinghel (Loughborough).

Funds may be available to support the attendance of the UK research students.

Enquiries should be addressed to the organisers: H.Ahmadinezhad (H.Ahmadinezhad@lboro.ac.uk) and A.P. Veselov (A.P.Veselov@lboro.ac.uk)

Institute of mathematics & its applications

LONDON MATHEMATICAL SOCIETY EST. 1865

LMS–IMA Joint Meeting
Symmetry and Computation

12 October 2017, 11am – 5pm
De Morgan House, Russell Square, London

Speakers (l to r): Evelyne Hubert (INRIA Méditerranée), Kurusch Ebrahimi-Fard (Trondheim), Peter Neumann (Oxford), Gloria Mari Beffa (U Wisconsin-Madison), Darryl Holm (Imperial)

The first joint meeting of the **Institute of Mathematics and its Applications** and the **London Mathematical Society** will take place on October 12, 2017, at De Morgan House, Russell Square, London.

Organisers: Elizabeth Mansfield, Arieh Iserles, Evelyne Hubert and Peter Hydon.

The meeting will be followed by a reception. Keep the date!

Express your interest by emailing lmsmeetings@lms.ac.uk by 30 May 2017.
You will still need to register for the meeting but your expression of interest means we can contact you when registration opens.

Background image: *Objects* by Matilda Leake

ANTON EVSEEV

Anton Evseev, who was elected a member of the London Mathematical Society on 15 November 2013, died on 21 February 2017, aged 34.

David Craven writes: Anton Evseev was born in Moscow in 1983, attending Russia's top mathematics school, School No 57; during this time he formed part of the 1999 Russian International Mathematical Olympiad team, winning a silver medal and helping his side tie for first place. He started studying mathematics at Moscow State University, but switched to St Anne's College, Oxford, where he completed his undergraduate degree in 2003, and his DPhil under the supervision of Marcus du Sautoy in 2007. After postdoctoral stints at Cambridge and Queen Mary, University of London, he took up a position as a Lecturer at the University of Birmingham in 2011, which he held until his death less than six years later.

Anton contributed to the theory of p-groups during his DPhil, working on the PORC conjecture of Graham Higman, but he was best known for his work in the representation theory of finite groups, particularly of the symmetric groups and related objects such as Hecke algebras. His first major work in this area was on the Külshammer-Olsson-Robinson conjecture, which he proved in 2012. In three papers, the first in 2015, and then the last two with Alexander Kleshchev a year later, he proved a deep conjecture of Will Turner on the modular representation theory of symmetric groups; this is likely to be one of the first steps in understanding the general structure of blocks of symmetric groups.

In his short time, he produced sixteen papers with twelve different co-authors, had taken on two PhD students, and had started to lay the foundations of a highly successful career when he tragically passed away at the age of 34.

PETER LEE

Peter Lee, who was elected a member of the London Mathematical Society on 16 May 1963, died on 10 March 2017, aged 76.

Tony Sudbery writes: Peter was a lecturer in the Department of Mathematics at the University of York from 1972 to 2005. He was an enthusiastic advocate for Bayesian statistics and a leader of the modern revival of this form of statistics; his book *Bayesian Statistics: An Introduction,* which was first published in 1989 and went into its fourth edition in 2012, is a standard textbook.

Peter was active in the running of the department, and was prominent in university committee work and in defending staff interests as Treasurer of the local branch of the Association of University Teachers (now the UCU). He was Provost of Wentworth College from 1985 to 2005. He was also a member of Court of the University of Liverpool.

Peter took his first degree at the University of Liverpool, graduating in 1962. In 1966 he was awarded a PhD in the Department of Pure Mathematics and Mathematical Statistics, Cambridge, for a thesis on Infinitely Divisible Stochastic Processes, supervised by John Kingman. He was then a Fellow of Peterhouse College until he took up a lectureship at York in 1972. He retired in 2005 and became an Honorary Fellow of the department.

Peter was a man of wide culture. He loved books, which he can be truly said to have devoured voraciously. He was always ready with an apt, and often humorous, quotation. He was a founding member and treasurer of the York Bibliographical Society, and a prominent member of the Yorkshire Philosophical Society. He spoke fluent Russian, and travelled widely in Russia and elsewhere.

The words 'affable' and 'convivial' might have been coined to apply to Peter. He always got on extremely well with students, many of whom remember him with the very greatest affection. Some of these travelled great distances to see him in his final days. His Mayday parties were a high point in the university calendar. Without his huge personality, York will be a less colourful place.

JOHN REEVE

John Reeve, who was elected to membership of the London Mathematical Society on 18 December 1952, died aged 88 on 16 February 2017. John served on the LMS Council 1966-73 and was founding editor of the *Bulletin,* 1968-72.

Peter Giblin writes: He was appointed to a Readership at the University of East Anglia in 1967, moving with his wife Rachel and their four children into a Victorian Old Rectory in the town of Reepham, north-west of Norwich. He and Rachel took a very kind and personal interest in his doctoral students, at UEA and, before that, in London. He retired in 1988 and UEA held a one-day meeting to mark his retirement which featured talks by Michael Atiyah and Roger Penrose, two friends who shared his love of geometry. (John was known to declare that he never believed anything until he could draw a picture of it.) After retirement John continued teaching and took an active role in the Norfolk branch of the Mathematical Association, serving on the branch committee for many years and giving entertaining talks in schools.

John was born in Hampstead and spent his early years on the south coast in Eastbourne and Bexhill, attending St Andrew's School, Eastbourne. At the start of WWII the family moved to Norfolk and he attended Canford School. Showing a talent in mathematics, he secured a scholarship to study at King's College London. He took up his first lecturing position at the University of Reading in 1955, moving back to King's College London in 1961, where he set up a new Topology group in the department. At King's John shared an office with Bernard Scott, who had been his MSc supervisor. John's academic interests were in topology and algebraic geometry merging into singularity theory, beginning with a paper summarising the results of his 1953 MSc thesis. This built on earlier work of K. Brauner and connected singularities of complex plane curves with knot theory. John told me he was especially pleased that J. Milnor cited this work in the ground-breaking *Singular Points of Complex Hypersurfaces* (1968) — and also that H.S.M. Coxeter cited his work on volumes of lattice polyhedra (1957-8), in which he sought three-dimensional analogues of the well-known Pick Theorem for lattice polygons. John continued his interest in singular complex curves, in the plane and on surfaces, in work with John Tyrrell (also at King's College), published between 1958 and 1966, and he passed on to me a problem on singular points of complex threefolds for my 1967 London thesis. Several of John's other PhD students pursued academic careers, among them Gwilym Edmunds, Roger Fenn and Alan Ball.

John was a popular lecturer, known for his enthusiasm, his sense of humour and, sometimes, for his disorganisation—he was a 'character'. On one memorable occasion John very bravely went, rolled umbrella in one hand and briefcase in the other, with a group of undergraduates from King's College on a hair-raising expedition to Battersea Funfair.

Outside academia John had particular interest in croquet and bridge. He chaired the Hunstanton Croquet Club for several years and played in tournaments throughout the country. Through his active participation in local bridge clubs he met his second wife Susan (Rachel very sadly died in 1977). John is survived by Susan, four sons Dominic, David, Duncan and Douglas, and 13 grandchildren.

Introduction to Geometry, Dynamics, and Moduli in Low Dimensions

LMS-CMI Research School

Warwick
11 – 15 September 2017

Organisers: J. Aramayona (Madrid), S. Schleimer (Warwick), J. Smillie (Warwick)

Course outline

The Research School will offer a broad introduction to low-dimensional geometry, topology, and dynamics. Experts in the field will each deliver a mini-course devoted to a particular sub-area. The mini-courses will be accompanied by problem sessions, supervised by tutors. The School is the opening event of the EPSRC-Warwick Symposium "Geometry, dynamics, and moduli in low dimensions" to be held at Warwick during the academic year 2017-18. Participants of the School are also invited to apply to the other workshops of the symposium.

Lecture Courses

Yael Algom-Kfir (Haifa) *Free groups as fundamental groups of graphs*

Tara Brendle (Glasgow) *Description of Teichmüller space in terms of hyperbolic geometry*

Nathan Dunfield (UIUC) *Methods for computation of geometric structures and invariants*

Erwann Lanneau (Grenoble) *Teichmüller dynamics*

Julien Marché (Paris VI) *Geometric structures viewed in terms of representations*

These lecture courses will be supplemented by tutorial sessions.

For further information, please visit: www2.warwick.ac.uk/fac/sci/maths/research/events/2017-18/symposium/igdm/

Apply online (https://tinyurl.com/gwgv8lr) by **16 June 2017.** Research students, post-docs and those working in industry are invited to apply. A reference is also required: https://tinyurl.com/jcmgffk

All applicants will be contacted within three weeks after the deadline; information about individual applications will not be available before then.

Fees

Research students: **£150**. There will be no charge for accommodation and subsistence costs.

Early career researchers: **£250**. There will be no charge for accommodation and subsistence costs.

Other participants (e.g. those working in industry): **£250**

Research students who have not completed their PhDs by the start of the Research School and who would otherwise be unable to attend can apply for financial aid.

Fees are not payable until a place at the Research School is offered but will be due by 11 August 2017.

LONDON MATHEMATICAL SOCIETY
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Algebraic Topology of Manifolds

LMS-CMI Research School

Oxford
11 – 15 September 2017

Organiser: Ulrike Tillmann (Oxford)

Manifolds are at the centre of much of geometry and topology, and through the influence of axiomatic topological quantum field theory they have become an important organising force in category and representation theory.

Classically, in the 1960s, algebraic topology was at the heart of their classification theory in form of characteristic classes and numbers, cobordism theory, surgery theory, and later Waldhausen's K-theory of manifolds. We are now experiencing a renaissance of the field as well as a paradigm shift where manifolds not only are the objects of study but become the tools.

The school aims at inspiring the next generation with this exciting success story of interwoven ideas bouncing between different fields, and giving the participants the tools to contribute to this lively research area.

Lecture Courses

Dan Freed (Austin, USA)
Topological Quantum Field Theory
Oscar Randall-Williams (Cambridge, UK)
Characteristic classes & moduli spaces of manifolds
Greg Arone (Virginia, USA)
The Goodwillie–Weiss embedding calculus
Nathalie Wahl (Copenhagen, Denmark)
Homological stability

These lecture courses will be supplemented by tutorial sessions. In addition there will be guest lectures.

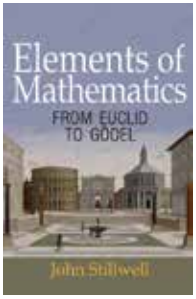
For further information, please visit: https://people.maths.ox.ac.uk/tillmann/ATM-SCHOOL.html

Apply online (www.surveymonkey.co.uk/r/RS33-ATManifoldsApplicationForm) by **16 June 2017.** Research students, post-docs and those working in industry are invited to apply. *All applicants will be contacted within three weeks after the deadline; information about individual applications will not be available before then*

Fees

Research students: **£150**. There will be no charge for subsistence costs.
Early career researchers: **£250**. There will be no charge for subsistence costs.
Other participants: **£250** plus subsistence costs.
Research students who will not have completed their PhDs by the start of the Research School and who would otherwise be unable to attend can apply for financial aid to cover their travel costs.
Fees are not payable until a place at the Research School is offered but will be due by 21 July 2017.

ELEMENTS OF MATHEMATICS: FROM EUCLID TO GÖDEL by John Stillwell, Princeton University Press, 2016, pp 440, £32.95, ISBN: 978-0691171685.



The inspiration for this book is Felix Klein's celebrated three-volume *Elementarmathematik vom höheren Standpunkte aus,* made available by Springer last year in a new English translation as *Elementary Mathematics from a Higher Standpoint.* Klein's audience was secondary school mathematics teachers: he offered them a panorama of the material they taught in the context of its historical development through to its place in the landscape of modern (1900s) mathematics. Stillwell's main goal is to revisit Klein's achievement from a twenty-first century perspective. In addition he has a philosophical aim: "to explain what 'elementary' means".

Klein's third volume is finally available in English for the first time. Stillwell has commented elsewhere on the lack of an earlier translation: "Evidently his subject matter [*Precision Mathematics and Approximation Mathematics,* in the new translation] was of lesser interest to English-speaking mathematicians of his time, and one doubts that it would be of much interest today, now that computers have completely revolutionized the practice of numerical and graphical approximation." Perhaps a more likely explanation is the early death in 1943 of Earle Raymond Hedrick, co-translator with Charles Noble of volumes 1 and 2. Besides, volume 3 concerns itself with applied mathematics, particularly geometrical applications of calculus. Its material is beyond the scope of Stillwell's present book but certainly deserves a similar treatment notwithstanding the computer revolution.

Computational mathematics constitutes the bulk of what in Stillwell's book would have been unrecognisable to Klein, who was, after all, still re-editing his books until he died in 1925. Combinatorics and probability and statistics are topics not dealt with per se by Klein, but only what was known up to the 1920s is covered by Stillwell. The treatments of algebra and vector geometry are correctly based in the work (recognised by Klein) of Grassmann who died in 1877; number theory is developed as algebraic number theory up to circa 1900; calculus is given in more or less as the same manner as in Klein's volume 1.

Computation apart, Stillwell is not offering a new century's worth of mathematics (the subtitle of his book says as much). But of course his selection of topics and their presentation is thoroughly modern and is very well done. His intended reader, already having 'a good high school training' and having read and enjoyed everything in this book, would be equipped to read any semi-technical account of any part of current pure mathematics. In answer to the question 'what is elementary mathematics?' one might reasonably say 'what is covered in Stillwell's book'.

But Stillwell is hoping for a non-self-referential answer and in this I feel he is not successful. Tentative suggestions are scattered through the book: "Mathematics without infinity ... could be a candidate for 'elementary mathematics'"; "non-Euclidean geometry is more advanced than Euclidean ... since non-Euclidean geometry was discovered more than 2000 years after Euclid"; "...deep questions about set theory and infinity, which are *very* advanced mathematics." (Stillwell's emphasis). There is some coverage of Harvey Friedman's 'reverse mathematics' programme in which 'less elementary' theorems are those necessitating stronger axiom systems. To me this seems rather removed from the spirit of the rest of the book, and from the spirit of Klein's books: would it make sense to tell secondary mathematics teachers that they must limit their material to, say, what is provable from Zermelo–Fraenkel minus the Infinity axiom?

There is a related but more informal and flexible interpretation of the word 'elementary' which is how it is used in the phrase 'elementary number theory'. It means, I suppose, something like 'without importing heavy machinery'. Maybe we can only assemble isolated examples but they are exciting and intuitive. Stillwell

would, on the evidence here, relate the stories compellingly. The elementary proof of the prime number theorem is the obvious candidate (alas analytic number theory is absent from the book) or there is Lovász's stunning 1978 proof of Kneser's conjecture in combinatorics using the Borsuk–Ulam theorem, matched only after nearly 25 years with an elementary proof, due to Jiří Matoušek. Every mathematician will have their favourite examples. Quite relevant is the recent book of John W Dawson, *Why Prove it Again?* (Birkhäuser, 2015) which collects case studies, quite informally but very interestingly, addressing its title.

Still, this was Stillwell's call to make and we cannot complain too much: he has written a very fine book full of beautiful mathematics expertly described. I recommend it.

A closing remark: in 2008, to mark the centenary of Klein's *Elementarmathematik,* the production of a modern rewriting was initiated by the IMU through its International Commission on Mathematical Instruction (of which Klein was the founding president). No such book appears to be forthcoming, perhaps the idea was made redundant by the appearance of Stillwell's book. However the project has spawned a useful blog called blog.kleinproject.org which publishes mathematical 'vignettes' in the spirit of Klein's book.

Robin Whitty
Queen Mary University of London

A GENTLE WIZARD by Nils Andersson, Speed of Think Publishing Ltd, 2017, pp 143, £5.99, ISBN978-0995646209.

This is a story about the interactions of a fictional character called Jack with Albert Einstein. The two of them form a close relationship when Einstein is in his latter years and Jack is a boy. Einstein takes pleasure in sharing his theories with Jack, and Jack is marvelled by the professor, as he calls him. Later in Jack's life, after he moves away to study at university, he learns from Einstein's assistant, Helen Dukas, that the professor has died. Jack grows up to be a scientific journalist, passing on to others the lessons that Einstein has taught him.

Interwoven with the text are snippets of Einstein's theory of relativity, delivered in an elementary way. Much of the physics comes in the form of conversations between Jack and Einstein. Jack asks the sort of naive questions that the reader may ask, and Einstein offers explanations, analogies, and enticing unsolved problems. We also learn something of Einstein's political beliefs, particularly during a meeting with Robert Oppenheimer, which Jack witnesses. After Einstein's death, the physics largely comes from excerpts of Einstein's manuscripts and from lectures of John Wheeler.

Although Jack and his family are fictional, the scientists who feature in the novel were all real people, as was Einstein's assistant Helen Dukas. The story itself evolves around actual events that happened, with some interpretation and rearrangement. Many of the quotes and extracts of text are factual.

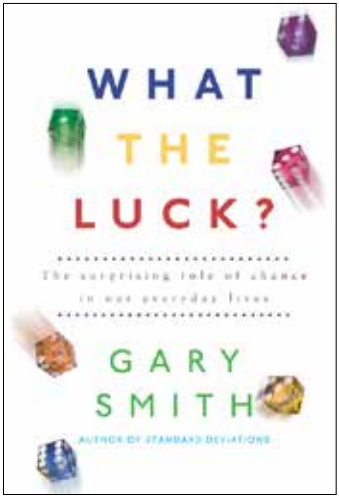
The book is written in a basic, accessible style; even the parts about relativity are presented in a user-friendly manner. There are 135 pages and a number of cartoon illustrations. It is suitable for children from the age of about ten upwards, and adults may enjoy reading it too. The explanations of physical phenomena have been expertly interlaced with the story in such a way that you get a taste of some of the intriguing aspects of relativity without becoming bogged down in heavy scientific arguments. These thought-provoking scientific ideas are carefully developed from one chapter to the next.

In summary, this is an attractive low-level introduction to relativity which should generate interest in science even among some young people who have otherwise felt repelled by the subject. Adults may find it to be an entertaining and stimulating read too.

Ian Short
The Open University

WHAT THE LUCK? by Gary Smith, Duckworth Overlook, 2016, pp 304, £16.99, ISBN 9-780715651612.

Francis Galton observed that the children of tall parents tended to be tall, but not as tall as their parents; and the corresponding statement, replacing "tall" with "short", was also true. This phenomenon is known as regression to the mean, and can be explained simply by modelling height as the sum of a heredity component, and random chance – the "Luck" in the book's title. It contains many examples, overwhelmingly from the USA, showing correlations unrelated to causes, and warnings against drawing unwarranted conclusions from a naïve interpretation of data. There are also illustrations of two other phenomena influenced by luck, publication bias and reliance on small samples, from which erroneous conclusions are too frequently drawn.



If you seek data to illustrate regression to the mean, you are spoiled for choice. In sports, the explanation of the frequency with which the top-rated young players go on to have disappointing careers is not simply that they fail to develop as expected: rather they were not as good as their raw statistics suggested – good fortune had smiled on them during their pre-draft year. The mean score of the students who do worst on a particular maths test is likely to be higher next time, via random chance, whether or not the teacher berates them for poor performance. Harold Hotelling's demolition of an argument by Horace Secrist, who concluded that it was inevitable that the performance of businesses would regress towards mediocrity is told with relish. Various bogus medical treatments that had short-lived popularity are described. Much use is made of Kelley's Equation, that the optimal prediction of Fred's ability is a combination of his own score on a test, and the mean score of his peer group, with his own score weighted by the "reliability" of that test, i.e. the extent to which performance on it is consistent.

Because many gamblers tend to overrate recent winners and underrate losers, bookies may seek to achieve a balanced book by setting odds that are, objectively, too generous to weaker teams. Smith describes a strategy to exploit this, looking to provide evidence that gamblers persistently underestimate the importance of luck.

There is very little mathematics here ("Every equation halves your sales"?), not even a formula for the least squares regression line. But there are plenty of Figures, often scatterplots with line fits superimposed, with telling use of the simple device of reversing the axes. There are clear warnings concerning the dangers of dredging through data and seeing deep significance in apparent phenomena, when random chance is an obvious alternative explanation.

Just as Simpson's Paradox is periodically "rediscovered", so researchers in business or medicine still continue to overlook regression to the mean as the more likely explanation of an apparent cause-effect phenomenon. With luck, this easy-to read account will, unacknowledged, help ensure that numerous spurious conclusions fail to find their way into publication.

John Haigh
University of Sussex

LMS PROSPECTS IN MATHEMATICS MEETING

CALL FOR EXPRESSIONS OF INTEREST FOR 2018

LONDON MATHEMATICAL SOCIETY
EST. 1865

The London Mathematical Society and the Prospects in Mathematics Meeting Steering Group invite Expressions of Interest from departments to host the next LMS Prospects in Mathematics Meeting to be held in the UK in 2017.

Up to £7,000 is available to support each of the LMS Prospects in Mathematics Meetings, which are annual two-day events (usually taking place in September) for Finalist Mathematics Undergraduates who are considering apply for a PhD after they have completed their current studies.

The meetings feature speakers from a wide range of mathematical fields across the UK who discuss their current research and what opportunities are available to prospective PhD students.

Funding is available to cover fares and accommodation for up to 50 students, travel and accommodation for speakers and subsistence for participants including a social event.

Prospective organisers should send an outline proposal to Marta Mazzocco (Chair of the Prospects in Mathematics Steering Group) (lmsmeetings@lms.ac.uk) by **1 June 2017.**

Expressions of interest should be short (max. one A4 side in length) and include:

- Confirmation of support from the department
- Reasons for wanting to host the LMS Prospects in Mathematics Meeting
- A provisional list of speakers should be included. Speakers should be representative of the UK research landscape both in geographical terms and in scientific terms.
- Speakers from under-represented groups should be included and women speakers should account for at least 40% of the invited speakers.
- Confirmation that prospective organisers have read and understood the terms and conditions in the Guidelines for Organisers (available from www.lms.ac.uk/events/lms-prospects-mathematics-meeting)
- Willingness to attend an upcoming LMS Prospects in Mathematics Meeting to get an idea of the event. The next event will be held at Reading from 7-8 September 2017.

All Expressions of Interest will be considered by the Prospects in Mathematics Steering Group, who will recommend a short-list to the LMS Programme Committee.

Short-listed applicants will then be invited to submit a grant application to the LMS Programme Committee for funding.

For further details about the LMS Prospects in Mathematics Meetings, please visit: www.lms.ac.uk/events/lms-prospects-mathematics-meeting A list of previously supported LMS Prospects in Mathematics Meetings, can be found at: www.lms.ac.uk/events/previous-prospects-in-maths-meetings

Before submitting: Organisers are welcome to discuss informally their ideas with the Marta Mazzocco (Chair of the Prospects in Mathematics Steering Group) (lmsmeetings@lms.ac.uk)

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.

MAY 2017

2 Rough Paths in Probability and Statistics, Reading (466)
5 Mary Cartwright Lecture, London (469)
10 Colloquia in Combinatorics, Queen Mary, University of London (469)
11 Colloquia in Combinatorics, London School of Economics, London (469)
8–12 Approximation, Deformation, Quasification INI Workshop, Cambridge (464)
12 New Mathematical Methods for Open Quantum Systems, Bristol (468)
12 North British Mathematical Physics Seminar, York (468)
18 Cohomology of Functor Categories for Infinite Discrete Groups, National University of Ireland, Galway (469)
18 Index Theorems in Analysis, Geometry and Mathematical Physics, University of Kent (466)
22–24 Gregynog Welsh Mathematics Colloquium, Gregynog Hall, Newtown, Powys (466)
23 Mathematics Can Make You Fly? Museum of London (469)
24 Combinatorics, Oxford (469)
25 LMS Education Day, London (469)
27 History of Mathematical Logic, Birkbeck (468)

JUNE 2017

1 LMS Northern Regional Meeting, York (469)
1 Combinatorial Techniques in Analysis and Probability, Lancaster (469)
1 Compressive Sensing Workshop, Bath (469)
2 Profinite Groups, Lincoln (468)
2–3 Integrable Models, Conformal Field Theory and Related Topics, Leeds (469)
5 London Crypto Day, Royal Holloway (469)
5 Escher and Coxeter: A Mathematical Conversation, Gresham College London (468)
7–9 Bond-Node Structures, Lancaster (469)
8–9 Scottish Partial Differential Equation Colloquium, St Andrews (469)
13–15 Interacting Systems and Stochastic PDEs, Sheffield (468)
15–16 Early Career Topology Researchers in Conference, Sheffield (469)
16 Invariant Theory: Recent Progress and Applications, Middlesex University (469)
19–23 Group Actions and Cohomology In Non-Positive Curvature, INI Cambridge (465)
19–23 New Trends in Representation Theory LMS–CMI Research School, Leicester (469)
19–23 Summer School and Workshop: The Sen Conjecture and Beyond, University College London
21–23 Recent Advances in the Numerical Analysis of PDEs, Bath (469)
26 Levy Processes and Anomalous Diffusion, Manchester (469)
26–30 Quantum Topology and Categorified Representation Theory, INI Cambridge (465)
26–30 Orthogonal Polynomials and Special Functions LMS-CMI Research School, Kent (467)
26–30 Géométrie Algébrique en Liberté, Bath (469)

26–30 Microlocal Analysis and Applications LMS–CMI Research School, Cardiff (468)
26–1 Jul Microlocal Analysis and Applications, LMS-CMI Research School, Cardiff (469)
27–30 Postgraduate Group Theory Conference, Cambridge (469)
28 LMS Popular Lectures, Institute for Education, London (469)
29 New Mathematical Methods in Computational Imaging. Heriot-Watt University (469)
30 LMS Graduate Student Meeting, London
30 LMS Society Meeting, London

JULY 2017

3–5 Gravity and Black Holes, Cambridge (468)
3–7 Scalable Statistical Inference, INI Cambridge (466)
3–7 BSDEs, SPDEs and their Applications Workshop, Edinburgh
3–7 British Combinatorial Conference, Strathclyde (464)
10–11 Boundary Integral Methods, Nottingham Trent University (468)
10–12 Mathematical Models in Ecology and Evolution Conference, City, University of London (466)
10–14 Computer-aided Mathematical Proof, INI Cambridge (466)
10–19 Foundations of Computational Mathematics Conference, Barcelona (461)
17–21 Conference on Applications of Computer Algebra, Jerusalem
31–5 Aug International Mathematics Competition, Blagoevgrad, Bulgaria (466)

AUGUST 2017

1–4 Young Researchers in Mathematics Conference, University of Kent (469)
6–12 Groups St Andrews Conference, Birmingham (469)
7–10 Nonlinear Water Waves, INI Cambridge (468)

SEPTEMBER 2017

1 Christopher Hooley and the Artin Conjecture: 50 Years On, Bristol (468)
4–8 September European Study Groups with Industry, Warwick (468)
4–8 Variational Methods, New Optimisation Techniques and New Fast Numerical Algorithm, INI Cambridge (468)
10–15 Mathematics Education for the Future Decade, Balatonfüred, Hungary (460)
11–15 Algebraic Topology of Manifolds LMS-CMI Research School, Oxford (469)
11–15 Introduction to Geometry, Dynamics, and Moduli in Low Dimensions LMS-CMI Research School, Warwick (469)
11–15 Scientific Computation and Differential Equations, Bath (466)
14–15 Heilbronn Annual Conference, Bristol
18 LMS Midlands Regional Meeting, Loughborough (469)
18–22 Extremal Combinatorics, Warwick (468)
18–22 Form and Deformation in Solid and Fluid Mechanics, INI Workshop, Cambridge (469)
20 LMS Popular Lectures, Birmingham (469)
24–29 Heidelberg Laureate Forum (465)
24–29 Clay Research Conference and Workshops, Oxford (469)

OCTOBER 2017

12 Symmetry and Computation LMS-IMA Joint Meeting, De Morgan House, London (469)

NOVEMBER 2017

10 Graduate Student Meeting, London
10 LMS Annual General Meeting, London

LMS-FUNDED MEETING

Young Geometric Group Theory Meeting

Mathematical Institute, Oxford, 20–24 March 2017

See report on page 15

(Photo credit: Vera Tonic)

Impromptu discussion amongst (l to r) Aditi Kar, Montserrat Casals-Ruiz, Martin Bridson and Emmanuel Breuillard

Attendees at the Young Geometric Group Theory Meeting

Goulnara Arzhantseva giving one of the lectures in her mini-course series

Daniel Woodhouse leads a Q&A discussion on *Cubical Small Cancellation*

Marissa Loving presents her poster

Michal Marcinkowski presents his poster