Department of Mathematics and Statistics
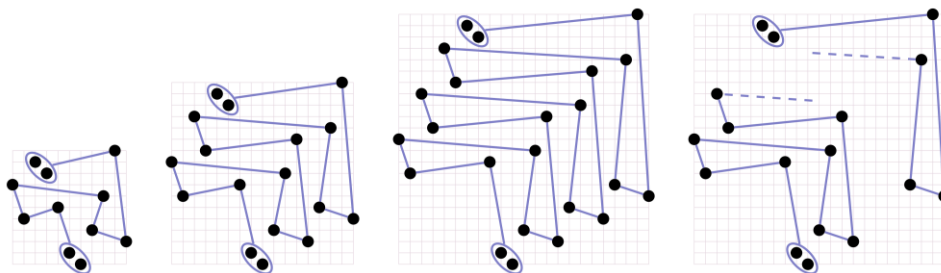
Faculty of Mathematics, Computing and Technology

Mathematics Research Report 2015

The first three elements and general form of an infinite antichain in Grid $\begin{pmatrix} \oplus\, 21 & \mathrm{Av}(21) \\ & \oplus\, 21 \end{pmatrix}$.
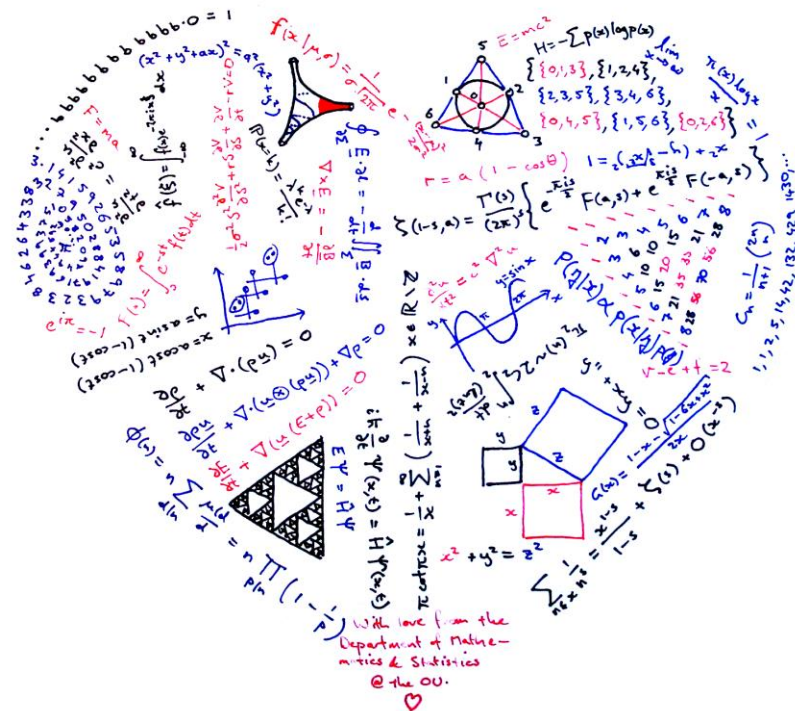
Foreword by Robert Brignall (Director of Research)

Welcome to the 2015 Mathematics Research Report, which covers the Pure, Applied, History, and Mathematics Education groups in the Department of Mathematics and Statistics, in the Faculty of Mathematics, Computing and Technology, at The Open University. The Statistics group publishes its own annual reports – http://mathematics.open.ac.uk/research/statistics/annual-reports

The Department has a fine tradition of organising day meetings and conferences that attract national and international participation. In 2015 the Department organised no fewer than twelve such meetings, many supported by funding bodies such as the London Mathematical Society, the British Combinatorial Committee, and Santander Universities.

Our postgraduate research students continue to make the department a vibrant research environment. As well as organising two of the conferences mentioned above, two of our students won prizes for their conference presentations: Rosie Cretney for her talk at the BMC/BAMC in Cambridge in March, and Mairi Walker for her poster at the Young Researchers in Mathematics Conference in Oxford in August. Well done, both!

Public engagement has always played a major part of the activities of the Department. In 2015, in addition to our continued involvement in Royal Institution Mathematics Masterclasses and our own Christmas Lecture in Milton Keynes, two of our research groups contributed to the presentations at the LMS 150th Anniversary Mathematics Festival at the London Science Museum in November. Finally, in this vein, the "maths heart" below was created by the Department for the national #loveparttime campaign in October. It contains 4 equations that draw a cardioid, or heart shape. Can you find them?

Prizes and honours

June Barrow-Green was elected a member of the International Academy of the History of Science

Rosie Cretney was awarded a student presentation prize at the Joint BMC/BAMC in Cambridge in March

Mairi Walker was awarded first prize in the Heilbronn Institute Poster Competition at the Young Researchers in Mathematics Conference, University of Oxford Mathematical Institute in August

Membership of Mathematics Groups 2015, as at 31 December 2015

Academic Staff

Barbara Allen, Senior Lecturer
Silvia Barbina, Staff Tutor
June Barrow-Green, Professor
David Brannan, Emeritus Professor
Robert Brignall, Senior Lecturer
Katie Chicot, Staff Tutor
Sally Crighton, Staff Tutor
Matthew Esplen, Lecturer
Martina Gibbons, Staff Tutor
Gerry Golding, Staff Tutor
Derek Goldrei, Associate Member
Mike Grannell, Emeritus Professor
Jeremy Gray, Emeritus Professor
Terry Griggs, Emeritus Professor
Uwe Grimm, Head of Department
Robert Hasson, Senior Lecturer
Gerard Hayes, Lecturer
Maggie Holland, Staff Tutor
Hilary Holmes, Staff Tutor
Chris Hughes, Staff Tutor
Tim Lowe, Senior Lecturer
John Mason, Emeritus Professor
Ben Mestel, Senior Lecturer
Toby O'Neil, Senior Lecturer
Sue Pawley, Staff Tutor (from April)
Marc Pradas, Lecturer
Brendan Quinn, Staff Tutor
Kathleen Quinn, Senior Lecturer
Philip Rippon, Professor
Hayley Ryder, Staff Tutor
Ian Short, Lecturer
Jozef Širáň, Professor
Gwyneth Stallard, Professor
Claudi Thomas, Staff Tutor
Andrey Umerski, Senior Lecturer
Paul Upton, Lecturer
Bridget Webb, Senior Lecturer
Michael Wilkinson, Professor

Gareth Williams, Staff Tutor
Robin Wilson, Emeritus Professor

Admin Staff

Sara Griffin, Secretary
Tracy Johns, Office Manager

Research Staff

David Sixsmith, Research Fellow (to May)

Research Students

Lax Chan (Full-time)
Rosanna Cretney (Full-time)
Alex Durie (Part-time)
Grahame Erskine (Full-time)
Vasiliki Evdoridou (Full-time)
Valentin Fadeev (Part-time)
John Grant (Part-time)
Matthew Jacques (Full-time)
Robert Lewis (Part-time)
Chris Lynch (Part-time)
David Martí Pete (Full-time)
Tony Royle (Part-time)
Jakub Sliacan (Full-time)
James Tuite (Part-time)
Paul Verschueren (Part-time)
Mairi Walker (Full-time)

Visiting Research Staff

Michael Baake, Visiting Professor
David Bevan, Visiting Fellow
Mick Bromilow, Visiting Fellow
David Crowe, Visiting Fellow
Tony Forbes, Visiting Fellow
Fred Holroyd, Visiting Fellow
John Osborne, Visiting Associate
Stan Zachary, Visiting Professor

Visitors

Robert Brignall	Professor Maurice Pouzet, 3-4 March
	Dr Aistis Atminas, April 2015 - March 2016
Mike Grannell	Professor Martin Knor (Slovak Technical University), 15-22 January
	Professor Diane Donovan (University of Queensland), 22-27 June
Terry S. Griggs	Andrew Kozlik (Charles University, Prague), 12-16 January
	Diane Donovan (University of Queensland), 15-17 June
	Nick Cavenagh (University of Waikato, New Zealand), 13-15 July
	Klara Stokes (University of Skovde, Sweden) 14-16 September
Uwe Grimm	Professor Michael Baake (University of Bielefeld), 15-22 September
Marc Pradas	Dr Benjamin Aymard (Imperial College London), long-term visitor, 1 Dec 2015 - 30 Nov 2016
Jozef Širáň	Professor Robert Jajcay (Comenius University, Slovkia), March 15-18
Gareth Williams	Professor Tara Holm (Cornell University) June

Research Degrees Awarded

David Bevan: PhD for his thesis *On the growth of permutation classes*. Supervisor: Robert Brignall.

Publications

Atminas, Aistis; **Brignall, Robert**; Korpelainen, Nicholas; Lozin, Vadim and Vatter, Vincent (2015). Well-Quasi-Order for Permutation Graphs Omitting a Path and a Clique. Electronic Journal of Combinatorics, 22(2), article no. P2.20.

Baake, Michael; Birkner, Matthias and **Grimm, Uwe** (2015). Non-periodic Systems with Continuous Diffraction Measures. In: Kellendonk, Johannes; Lenz, Daniel and Savinien, Jean eds. Mathematics of Aperiodic Order. Progress in Mathematics (309). Basel: Birkhauser, pp. 1–32.

Bachratý, Martin and **Širáň, Jozef** (2015). Polarity graphs revisited. Ars Mathematica Contemporanea, 8(1) pp. 55–67.

Barrow-Green, June (2015). "Anti-aircraft guns all day long": Karl Pearson and computing for the Ministry of Munitions. Revue d'Histoire des mathématiques, 21 pp. 111–150.

Barrow-Green, June and Siegmund-Schultze, Reinhard (2015). The history of applied mathematics. In: Higham, Nicholas ed. The Princeton Companion to Applied Mathematics. Princeton, NJ: Princeton University Press, pp. 55–79.

Barrow-Green, June (2015) "Clebsch too notice of me": Olaus Henrici and surface models, in History of Mathematics: Models and Visualization in the Mathematical and Physical Sciences, Mathematisches Forschungsinstitut Oberwolfach, Report Number 47/2015, pp.22-25.

Bevan, David (2015). Permutations avoiding 1324 and patterns in Łukasiewicz paths. Journal of the London Mathematical Society, 92(1) pp. 105–122.

Bevan, David (2015). Growth rates of permutation grid classes, tours on graphs, and the spectral radius. Transactions of the American Mathematical Society, 367(8) pp. 5863–58

Brignall, Robert and Vatter, Vincent (2015). A simple proof of a theorem of Schmerl and Trotter for permutations. Journal of Combinatorics, 6(1–2) pp. 47–54.

Donovan, D. M., **Griggs, T. S.**, Lefevre, J. G. and McCourt, T. A. (2015) Further biembeddings of twofold triple systems 8 pp. 267-273.

Drapal, A. **Griggs, T. S.** and Kozlik, A. (2015) Pure Latin directed triple systems, Australasian Journal of Combinatorics 62 pp. 59-75.

Drapal, A. **Griggs, T. S.** and Kozlik, A. (2015) Basics of DTS-quasigroups: Algebra, Geometry and Enumeration, Journal of Algebra and its Applications 14 ref.1550089 24pp.

Erskine, Grahame (2015). Diameter 2 Cayley graphs of dihedral groups. Discrete Mathematics, 338(6) pp. 1022–1024.

Gomes, S. N.; **Pradas, M.**; Kalliadasis, S.; Papageorgiou, D. T. and Pavliotis, G. A. (2015). Controlling spatiotemporal chaos in active dissipative-dispersive nonlinear systems. Physical Review E, 92(2), article no. 022912.

Gotoda, Hiroshi; **Pradas, Marc** and Kalliadasis, Serafim (2015). Nonlinear forecasting of the generalised Kuramoto-Sivashinsky equation. International Journal of Bifurcation and Chaos (IJBC), 25(05), article no. 1530015.

Grannell, Mike and Schroeder, Justin (2015). Biembeddings of 2-rotational Steiner triple systems. Electronic Journal of Combinatorics, 22(2), article no. P2.23.

Grant, John and **Wilkinson, Michael** (2015). Advection-Diffusion Equation with Absorbing Boundary. Journal of Statistical Physics, 160(3) pp. 622–635.

Griggs, T. S.; Psomas, C. and **Širáň, J**. (2015). Biembedding Steiner Triple Systems in Surfaces Using the Bose Construction. Journal of Combinatorial Designs, 23(3) pp. 91–100.

Grimm, Uwe (2015). Aperiodic crystals and beyond. Acta Crystallographica Section B, 71(3) pp. 258–274

Gustavsson, Kristian; Mehlig, Bernhard and **Wilkinson, Michael** (2015). Analysis of the correlation dimension for inertial particles. Physics of Fluids, 27, article no. 073305.

Krumscheid, S.; **Pradas, M**.; Pavliotis, G. A. and Kalliadasis, S. (2015). Data-driven coarse graining in action: Modeling and prediction of complex systems. Physical Review E, 92(4), article no. 042139

Lin, Te-Sheng; **Pradas, Marc**; Kalliadasis, Serafim; Papageorgiou, Demetrios T. and Tseluiko, Dmitri (2015). Coherent Structures in Nonlocal Dispersive Active-Dissipative Systems. SIAM Journal on Applied Mathematics, 75(2) pp. 538–563.

Loch, Birgit; **Lowe, Tim W**. and **Mestel, Ben D**. (2015). Master's students' perceptions of Microsoft Word for mathematical typesetting. Teaching Mathematics and its Applications, 34(2) pp. 91–101

Lowe, Timothy (2015). Online quizzes for distance learning of mathematics. Teaching Mathematics and its Applications, 34(3) pp. 138–148.

Matthew, George Jr. S.; Nuttall, William; **Mestel, Ben** and Dooley, Laurence (2015). Insights into the Thermal Generation Futures of Isolated Island Electricity Systems Using System Dynamics. In: Proceedings of the 33rd International Conference of the System Dynamics Society, 19-23 July 2015, Cambridge, Massachusetts, US

O'Farrell, Anthony G. and **Short, Ian** (2015). Reversibility in Dynamics and Group Theory. London Mathematical Society Lecture Note Series, 416. Cambridge: Cambridge University Press.

Rippon, P. J. and **Stallard, G. M.** (2015). Annular itineraries for entire functions. Transactions of the American Mathematical Society, 367(1) pp. 377–399.

Schmuck, M.; **Pradas, M**.; Pavliotis, G. A. and Kalliadasis, S. (2015). A new mode reduction strategy for the generalized Kuramoto–Sivashinsky equation. IMA Journal of Applied Mathematics, 80(2) pp. 273–301.

Sixsmith, D. J. (2015). Functions of genus zero for which the fast escaping set has Hausdorff dimension two. Proceedings of the American Mathematical Society, 143(6) pp. 2597–2612.

Sixsmith, Dave (2015). Julia and escaping set spiders' webs of positive area. International Mathematics Research Notices, 2015(19) pp. 9751–9774.

Sixsmith, Dave (2015). Maximally and non-maximally fast escaping points of transcendental entire functions. Mathematical Proceedings of the Cambridge Philosophical Society, 158(2) pp. 365–383.

Sixsmith, Dave (2015). Dimensions of slowly escaping sets and annular itineraries for exponential functions. Ergodic Theory and Dynamical Systems (Early view).

Upton, P. J. (2015). The Delta Function and Generalized Functions. In: Higham, Nicholas J.; Dennis, Mark R.; Glendinning, Paul; Martin, Paul A.; Santosa, Fadil and Tanner, Jared eds. The Princeton Companion to Applied Mathematics. Princeton, NJ, USA: Princeton University Press, pp. 139–141

Wilkinson, Michael; Guicharaz, Robin; **Pradas, Marc** and Pumir, Alain (2015). Power-law distributions in noisy dynamical systems. EPL, 111(5), article no. 50005.

Wilson, Robin (2015). Topics in Chromatic Graph Theory (edited with L.W. Beineke), Cambridge University Press.

Wilson, Robin (2015). Map-coloring problems, A Century of Advancing Mathematics, MAA, 35–49.

Wilson, Robin (2015). The Lull before the storm: combinatorics in the Renaissance (with J. Fauvel), Mathematics and their Gods, Oxford Univ. Press, 89–103.

Conference & workshop papers and posters given

June Barrow-Green	Sofia Kovalevskaya: a 19th Century Pioneer for Women in Mathematics, Florence Nightingale Day, Lancaster University, December
	From Pythagoras to pacifism: mathematics and archives. Ada Lovelace Symposium, Oxford, December
	The geometrical models of Olaus Henrici. Models and visualization in the mathematical and physical sciences. Oberwolfach, October.
	Sylvester's Amphigenous Surface, MAA Mathfest, Washington DC, August.
	Olaus Henrici and mathematical models, AMS-EMS-SPM meeting, Porto, June.
	Olaus Henrici and mathematical models, BMC/BAMC Cambridge, April.
	Mathematics in the Philosophical Transactions of the Royal Society during the 19th century: the case of William Henry Fox Talbot. 'Publish or Perish? The past, present and future of the scientific periodical, The Royal Society, March.
David Bevan	The matching polynomial and geometric grid classes of permutations, 46th Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Florida Atlantic University, Boca Raton, Florida, March.
	Geometric grid classes of permutations and the matching polynomial, Spring Northeastern Sectional Meeting of the American Mathematical Society, Georgetown University, Washington, DC, March (invited talk).
	Expansions in non-integer bases and intervals of permutation class growth rates, Permutation Patterns 2015, London, June.
	The growth of permutations avoiding 1324, 25th British Combinatorial Conference, University of Warwick, July.
Rosanna Cretney	The construction of map projections in the works of Lambert and Euler. Special session in memory of Jackie Stedall, MAA Mathfest, Washington, DC.
Grahame Erskine	The mixed degree-diameter problem (searching for large mixed graphs of diameter 2). ATCAGC 2015, Madeira, January.
	Algebraic methods in the degree-diameter and degree-girth problems. Postgraduate Combinatorics Conference 2015, QMUL London, April.
	The degree-diameter problem for partially directed graphs. Scottish Combinatorics Meeting 2015, Glasgow, April.
	New constructions for large circulant graphs of given degree and diameter. British Combinatorics Conference 2015, Warwick, July.
Vasiliki Evdoridou	Fatou's web and non-escaping endpoints, Topics in Complex Dynamics, University of Barcelona, November 2015 (talk)
	Fatou's web, LMS Graduate Student Meeting, London, November 2015 (talk)

Fatou's web and non-escaping endpoints, Workshop on Ergodic Theory and Holomorphic Dynamics, ESI Vienna, September 2015 (talk)

Fatou's web, Holomorphic Dynamics Meeting, LMS Scheme 3, Imperial College London, September 2015 (talk)

Fatou's web, AMS-EMS-SPM International Meeting, Porto, June 2015 (talk)

Sufficient conditions for a point to be fast escaping, Summer school on Normal Families in Complex Analysis, University of Wuerzburg, May 2015 (poster)

Sufficient conditions for a point to be fast escaping, It All Adds Up: Celebrating women across the Mathematical Sciences, Oxford, April 2015 (poster)

Terry S. Griggs	Combinatorics of the sonnet, 25th British Combinatorial Conference, Warwick, July.
Uwe Grimm	On the relation between diffraction and dynamical spectra, Workshop on Aperiodic Order, University of Leicester, January
	Recent progress in mathematical diffraction, Workshop on time-frequency analysis and aperiodic order, Trondheim, Norway, June
	Scaling properties of the Thue-Morse measure, Workshop on Spectral Theory of Aperiodic Systems, Heinrich-Fabri-Institut, Blaubeuren, Germany, June
	Diffraction of a simple non-Pisot inflation, Aperiodic 2015, Břevnov Monestary, Prague, Czech Republic, August/September
	Examples of tilings and cut and project sets, Arbeitsgemeinschaft: Mathematical Quasicrystals, Mathematisches Forschungsinstitut Oberwolfach, Germany, October
	Diffraction in Aperiodic Order, Geometry and dynamics of quasiperiodic structures, Institut H. Poincaré, Paris, France, November/December
Matthew Jacques	Continued fractions and semigroups of Möbius transformations, Stony Brook, May (poster)
Tim Lowe	Using GeoGebra applets in a distance learning mathematics module, GeoGebra Global Gathering, Linz, Austria, July.
David Martí Pete	Escaping Fatou components of transcendental self-maps of the punctured plane, in the conference Topics in Complex Dynamics 2015, Universitat de Barcelona, Barcelona (Spain), November. (talk)
	Escaping Fatou components of transcendental self-maps of the punctured plane, in the workshop Ergodic theory and holomorphic dynamics, Erwin Schrödinger Institute, Vienna (Austria), September (talk)
	Escaping Fatou components of transcendental self-maps of the punctured plane, in the special session on Holomorphic Dynamics at the AMS-EMS-SPM International Meeting, Porto (Portugal), June (talk)

	The escaping set of transcendental self-maps of C*, at the summer school "Normal Families in Complex Analysis", Universität Würzburg, Würzburg (Germany), May (poster)
	Escaping Fatou components of transcendental self-maps of the punctured plane, at the LMS Scheme 3 Meeting in Holomorphic Dynamics at Imperial College, London (UK), September (talk)
Ben Mestel	The barrier billiard renormalization strange set: golden mean trajectory, Open Statistical Physics, Open University, Milton Keynes, UK, March
	The barrier billiard renormalization strange set: golden mean trajectory, The Joint British Mathematical Colloquium, Cambridge, UK, March
John Osborne	Connectedness properties of the set where the iterates of an entire function are unbounded. Postgraduate Conference in Complex Dynamics. De Morgan House, London, March
Marc Pradas	Stick-slip motion and hysteresis behaviour of droplets with dynamic volume variation, British Applied Mathematics Colloquium 2015, University of Cambridge, April.
	Stick-slip motion and hysteresis behaviour of droplets with dynamic volume variation. 8th GRACM International Congress on Computational Mechanics. Volos (Greece), July.
	Stick-slip motion and hysteresis behaviour of droplets with dynamic volume variation. 6th Bifurcations and Instabilities in Fluid Dynamics Symposium. Paris (France), July.
	Noise-induced critical transitions in multiscale systems, Symposium on fluctuation driven phenomena in non-equilibrium statistical mechanics. University of Warwick, September (Invited participant).
	Stick-slip motion and hysteresis behaviour of droplets with dynamic volume variation. Droplets 2015. University of Twente (The Netherlands), October.
	Oscillatory behavior in two-pulse dynamics in active-dissipative systems. 68th APS - DFD meeting. Boston (USA), November.
	Noise-induced critical transitions in multiscale systems, International Workshop - "Challenges in statistical mechanics: from mathematics to molecular dynamics to technological applications", Imperial College London, December (Invited speaker).
Phil Rippon	Connectedness properties of the set where the iterates of an entire function are unbounded, Meeting in honour of Prof. Janina Kotus, Warsaw, May
	Escaping boundary points of Baker domains, Holomorphic dynamics session, AMS-EMS-SPM meeting, Porto, June
	Connectedness properties of I+(f), Ergodic theory and holomorphic dynamics, ESI, Vienna, September
Ian Short	Continued fractions and discrete semigroups of Moebius transformations, Celebrating New Appointments meeting, University of South Wales, June

Jozef Širáň	Chiral regular maps of any given type from coverings, contributed talk, Algebraic, Topological and Computational Aspects of Graph Covers, Madeira, January
	Vertex quasiprimitivity of regular maps, invited talk, Graphs and Groups, Koper, Slovenia, May
	Large Cayley graphs of given degree and diameter from finite geometries, contributed talk, 6th Slovenian International Graph Theory Conference Kranjska Gora, June
	The degree-diameter problem for vertex-transitive graphs and finite geometries, invited talk at the Geometry and Symmetry Conference, Veszprém, Hungary, July
Gwyneth Stallard	Commuting functions and multiply connected wandering domains, Ergodic theory and holomorphic dynamics, ESI, Vienna, September
	Permutable entire functions and multiply connected wandering domains at international meeting in Porto, June
	The structure of the escaping set of a transcendental entire function, Janina Kotus birthday session, Warsaw, May
Paul Verschueren	Quasiperiodic Birkhoff sums and products, Open Statistical Physics Conference, Milton Keynes, March
	Asymptotics of Quasiperiodic Products, 4th Joint BMC/BAMC Colloquium, Cambridge April
Mairi Walker	Gaussian integer continued fractions, the Picard group and hyperbolic geometry. Postgraduate Conference in Complex Dynamics, De Morgan House, London, March
	Gaussian integer continued fractions. Young Researchers in Mathematics Conference, Oxford, August
	Gaussian integer continued fractions. Young Researchers in Mathematics Conference, Oxford, August (poster).
Bridget S. Webb	Subsystems of Netto triple systems, 25th British Combinatorial Conference, University of Warwick, July
	Subsystems of Netto triple systems, 39th Australasian Conference on Combinatorial Mathematics and Combinatorial Computing, University of Queensland, December
Michael Wilkinson	Dynamics and Evolution of Earth-like Planets, KITP Workshop, UCSB, (invited workshop participant)
	Anisotropic Particles in Turbulence, NTNU, Trondheim (invited speaker)
	Unsolved Prooblems of Noise, Barcelona (contributed talk)
	European Turbulence Conference, Delft (contributed talks)
	Fluctuation-driven phenomena in Non-equilibrium Systems, Warwick (invited workshop participant)

Growing length scale phenomena in condensed matter physics, Bangalore (invited speaker)

Gareth Williams	Weighted projective spaces, cohomology and piecewise algebra. Invited lecture at Geometry and Topology: A conference in honor of Martin Bendersky's seventieth birthday and in commemoration of our friend and colleague Sam Gitler. Princeton University, March.
Robin Wilson	The history of maths in 300 stamps, Cambridge Science Festival, March
	A century of graph theory, AMS–EMS–SPM Meeting, Porto, Portugal
	The history of the BSHM, BSHM-CSHPM meeting in Washington DC

Mathematics seminars hosted by the Department

In 2015, 24.2% of our seminar speakers were women.

Gareth Williams (Open) *Weighted projective spaces, cohomology and piecewise algebra*

Henna Koivusalo (York) *Pattern complexity of cut and project sets*

Robert Brignall (Open) *From permutations to graphs: well-quasi-ordering and infinite antichains*

David Bevan (Open) *The growth of permutations avoiding 1324*

John Osborne (Open) *A dynamical partition of the plane based on orbits of points under iteration by an entire function*

John Grant (Open) *Triangular Constellations in Fractal Measures*

Jake Fillman (Rice) *Spreading Estimates for Quantum Walks in One Dimension*

Sloan Despeaux (Western Carolina) *Mathematical Exchanges in Britain through Questions and Answers*

Deborah Kent (Drake) *Back to the future: Digital design for the 11th century*

Michela Ottobre (Heriot-Watt) *Irreversible dynamics*

Svetlana Jitomirskaya (UC Irvine) *Quasiperiodic Schrodinger operators: arithmetic spectral transitions*
Adrian Rice (Randolph-Macon College) *Commutativity and Collinearity: A Fundamental Connection Between Pappus and Diophantus*

Constanza Rojas-Molina (Ludwig Maximilian) *Ergodic properties and localization for Delone-Anderson models*

James Sprittles (Warwick) *Singular Capillary Microflows: Modelling, Computation & Scaling*

Lucas Lacasa (Queen Mary) *Time Series meet Network Science*

Rob Lewis (Open) *The degree-diameter problem for circulant graphs of small degree and arbitrary diameter*

Rod Halburd (UCL) *Singularity and Integrability: Beyond the Painlevé Property*

Lax Chan (Open) *Dynamics and diffraction of the Thue-Morse chain*

Mairi Walker (Open) *Continued fractions with coefficients in Z[√2i]*

Grahame Erskine (Open) *Walls and cliques - a problem in extremal graph theory*

David Martí Pete (Open) *Escaping Fatou components of transcendental self-maps of the punctured plane*

Michael Baake (Bielefeld) *The recombination equation for general partitions and its solution*

Shaun Bullett (Queen Mary) *Mandelbrot sets for matings*

Igor Razgon (Birkbeck) *Well-quasi-ordering does not imply bounded clique-width*

Jonathan Fraser (Manchester*) Inhomogeneous attractors: structure and dimension*

Steven Galbraith (Auckland) *Kangaroos, card tricks and discrete logarithms*

Constanze Roitzheim (Kent) *Model categories - the joy of abstract nonsense*

Colm Connaughton (Warwick) *Instantaneous gelation and explosive condensation in non-equilibrium cluster growth*

Dave Sixsmith (Nottingham) *Non-chaotic domains in space*

Peter McClintock (Lancaster) *Coulomb blockade in biological ion channels*

Stan Zachary (Heriot-Watt) *Mathematical challenges in balancing electricity supply and demand*

Volker Remmert (Bergische Universität Wuppertal) *The Art of Garden and Landscape Design and the Mathematical Sciences in the Early Modern Period*

Jeremy Gray (Open) *Hermann Weyl's quest for meaning in mathematics*

Visits to other institutions

Silvia Barbina	University of Barcelona, May
David Bevan	University of Florida, Gainesville, March.
Robert Brignall	University of Florida, USA, April
	Birkbeck College, University of London, July
	KAIST, South Korea, November
Mike Grannell	University of Queensland, March
	Slovak Technical University, November
Terry S. Griggs	Plymouth University, April/May
	Charles University, Prague, September
Uwe Grimm	University of Tasmania, Hobart, Australia, February/March
	University of Bielefeld, Germany, October
Ben Mestel	Visits to Johns Hopkins, Harvard and Princeton Universities, USA, June
Marc Pradas	Université Libre de Bruxelles, Belgium, February.
	Loughborough University, July.
	Tokyo University of Science, Japan, August.
Jozef Širáň	University of Auckland, New Zealand, February
Mairi Walker	The University of the Witwatersrand, South Africa, April to June
Bridget S. Webb	Two visits to The University of Queensland, Brisbane, December to May and November.
	Two visits to Monash University, Melbourne, January and April
Gareth Williams	Cornell University, Ithaca, NY, USA. March

Conferences/meetings organised by members of the Department

History of Mathematics Programme, Institut Mittag-Leffler, Stockholm, 17 January – 5 February 2015. Organisers: **June Barrow-Green**, **Jeremy Gray**, Reinhard Siegmund-Schultze

BSHM Research in Progress: one-day meeting at The Queen's College, Oxford, February. Organisers: **Rosanna Cretney**, Christopher Hollings, and Peter Neumann

Winter Combinatorics Meeting, Open University, March. Organisers**: Robert Brignall**, **Kathleen Quinn** and **Jozef Širáň**

Postgraduate Conference in Complex Dynamics, De Morgan House, London, March. Organisers: **Vasiliki Evdoridou** and **David Martí Pete**.

Open Statistical Physics 2015, Open University, March, Organisers: **Michael Wilkinson**, **Uwe Grimm**, Jim Hague, **Marc Pradas**, **Paul Upton**

History of mathematics mini-symposium, The Joint British Mathematical Colloquium & British Applied Mathematical Colloquium, Cambridge, March. Organiser: **June Barrow-Green**

Augustus De Morgan, British Society for the History of Mathematics & London Mathematical Society, May. Organiser: **June Barrow-Green**

Permutation Patterns 2015, London, June. Organisers: **Robert Brignall** and **David Bevan**.

Workshop on Spectral Theory of Aperiodic Systems, Heinrich-Fabri-Institut, Blaubeuren, Germany, June, Organisers: Michael Baake, Franz Gähler, **Uwe Grimm**, Christian Huck

Workshop on the Mathematics of Demand Side Management and Energy Storage, The Open University, Milton Keynes, June. Organisers: Chris Dent, Jacqueline Edge, **Ben Mestel** and Stan Zachary

Special session on the history of mathematics at the joint AMS-European Mathematical Society-Sociedade Portuguesa de Matemática meeting, Porto, June. Organisers: **June Barrow-Green**, Luis Saraiva, Jim Tattersall, **Robin Wilson**

BSHM /Canadian Society for the History and Philosophy of Mathematics (CSHPM) conference, Washington DC, August. Organisers: **June Barrow-Green**, **Robin Wilson**, Maria Zack

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Invited seminars and talks given

June Barrow-Green	What did British Mathematicians do during the First World War? Legacy Garden Celebration Event. Open University, July.
	Sofia Kovalevskaya: a 19th century pioneer for women in mathematics; Women computers in WW1 and WW2. City of London Academy. January [2 lectures]
David Bevan	Expansions in non-integer bases and intervals of permutation class growth rates, University of Florida, Mathematics Colloquium, Gainesville, March.
	The growth of permutations avoiding 1324, University of Florida, Combinatorics Seminar, Gainesville, March.
Robert Brignall	The basis of 2x2 grid classes, Combinatorics Seminar, University of Florida, USA, April.
	Characterising structure in classes of unbounded clique-width, Combinatorics Seminar, University of Bristol, UK, October.

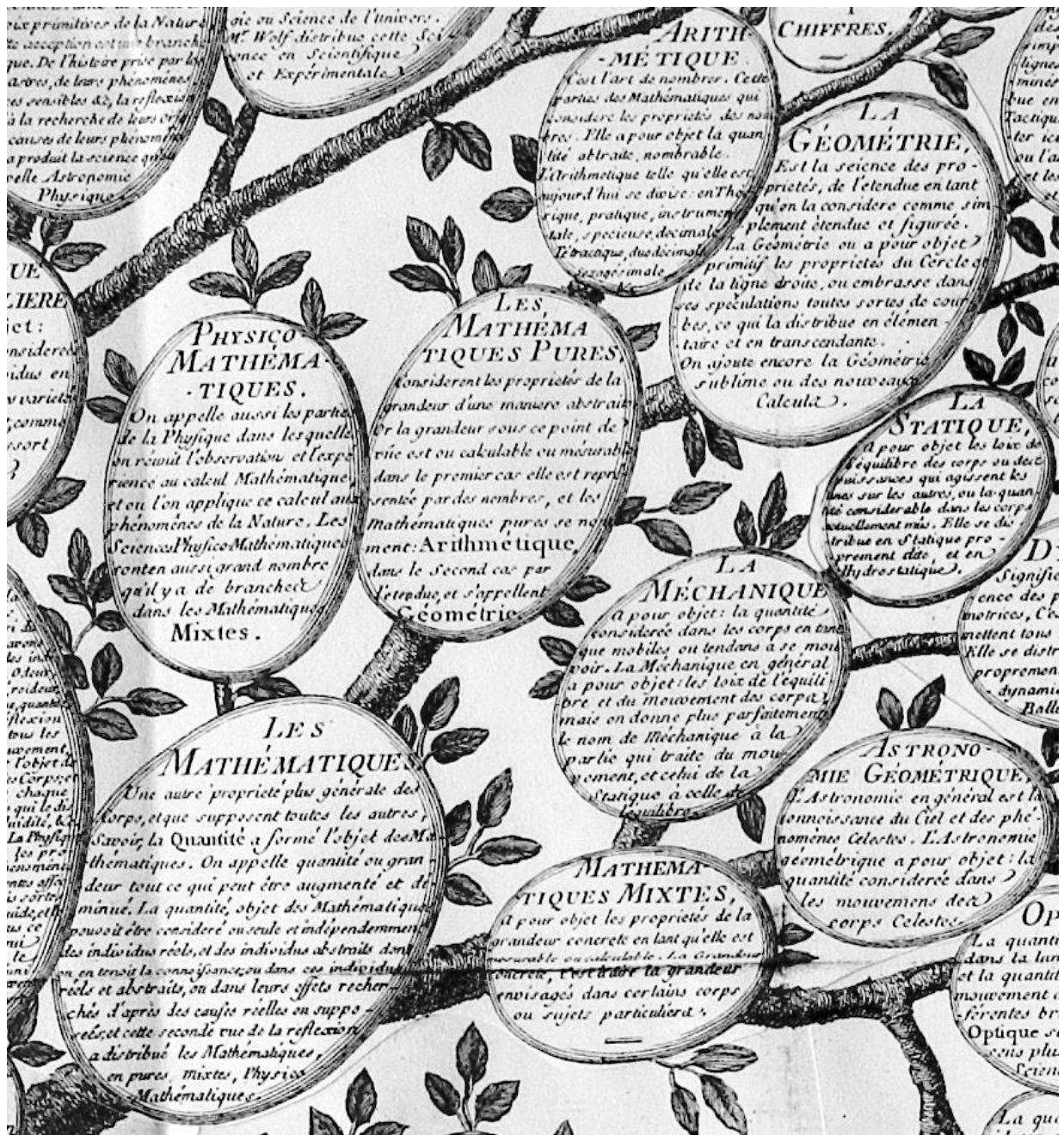|	
	Characterising structure in classes of unbounded clique-width, Discrete Math Seminar, KAIST, South Korea, November.
Rosanna Cretney	J. H. Lambert on the mathematics of map-making. Joint British Mathematical Colloquium/British Applied Mathematics Colloquium, Cambridge, March 2015
Grahame Erskine	Methods for finding nice drawings of graphs. Open University eColloquium, December.
Vasiliki Evdoridou	Fatou's web and non-escaping endpoints, University College Dublin, December 2015
	Fatou's web, Aristotle University of Thessaloniki, June 2015
Matthew Jacques	Semigroups of Möbius transformations, Postgraduate Conference in Complex Dynamics, London, March.
	Composition sequences and semigroups of Mobius transformations, Imperial College, September.
David Martí Pete	The escaping set of transcendental self-maps of the punctured plane, at the Analysis Seminar, University College Dublin, Dublin (Ireland), December (talk)
	Escaping Fatou components of transcendental self-maps of the punctured plane" at the Complex Dynamics Working Seminar, Universitat de Barcelona, Barcelona (Spain), February (talk)
Ben Mestel	The barrier billiard renormalization strange set: golden mean trajectory, Portsmouth University, Portsmouth, UK, February
	Optimal battery charge/discharge strategies for consumers and suppliers, Johns Hopkins University, Baltimore, USA, June
	Optimal battery charge/discharge strategies for consumers and suppliers, Princeton University, Princeton, USA, June
Marc Pradas	Complex dynamics in multiscale systems. Université Libre de Bruxelles, Belgium, February.
	Noise-induced complexity in multiscale systems. Manchester University, April.
	Analysing complex behaviour in interfacial flows. University of Warwick, October
	Analysing complex behaviour in interfacial flows. Loughborough, November
Ian Short	Continued fractions, discrete semigroups and hyperbolic geometry, Birkbeck College, University of London, March
Jozef Širáň	Large Cayley graphs of diameter 3 from finite geometries, seminar, University of Auckland, New Zealand, February
	Regular maps, seminar given at University of Warwick, November
Gwyneth Stallard	Commuting functions and multiply connected wandering domains, UCL, July
	Permutable entire functions and multiply connected wandering domains, Liverpool, May
Paul Verschueren	The Fractal Bat and his Strange Family, Portsmouth, June

Mairi Walker	Gaussian integer continued fractions. University of the Witwatersrand, South Africa, April
	Convergence of integer continued fractions. Manchester, June
Bridget S. Webb	Homogeneous and set homogeneous Steiner triple systems, University of Queensland, Brisbane, March.
	Homogeneous and set homogeneous Steiner triple systems, Monash University, Melbourne, April.
Gareth Williams	Weighted projective spaces, cohomology and piecewise algebra. Cornell University, March.
Michael Wilkinson	Manchester, February.
Robin Wilson	Lewis Carroll in Numberland, Museum of Mathematics, New York
	Lewis Carroll in Numberland, Baylor University, Waco, Texas

Editorial roles

June Barrow-Green	Historia Mathematica (Editorial Board member)
	Revue d'histoire des Mathématiques (Editorial Board member)
	Philosophia Scientiæ (Editorial Board member)
	BSHM Bulletin (Editorial Board member)
	AMS History of Mathematics Series (Editorial Board member)
Robert Brignall	Australasian Journal of Combinatorics (Managing Editor)
	Discrete Mathematics and Theoretical Computer Science (Guest Editor for Special Issue)
Toby O'Neil	Editorial Advisor for the London Mathematical Society
Ian Short	Bulletin of the Irish Mathematical Society (Editorial Board member)
Jozef Širáň	Journal of Combinatorial Theory Series B (Editorial board member)
	Ars Mathematica Contemporanea (Editorial board member)
	Australasian Journal od Combinatorics (Editorial board member)
Gwyneth Stallard	Subject editor for the Proceedings of the Edinburgh Mathematical Society

Other Activities

June Barrow-Green	Vice-chair of the International Commission on the History of Mathematics
	Member of the Science Museum Mathematics Gallery Advisory Panel
	LMS Librarian
Katie Chicot	LMS Holgate Lecturer
	Mathematics Masterclasses Organiser Bradford series
	UKMT Council member
	BSA FoS Maths Section Committee member
Rosanna Cretney	Webmaster, British Society for the History of Mathematics
	Volunteer, UK Mathematics Trust (Team Maths Challenges and Senior Mentoring)
Uwe Grimm	Chair of Commission on Aperiodic Crystals of the International Union of Crystallography
	Member of the Mathematical and Theoretical Physics Group Committee of the Institute of Physics
	Member of the International Programme Committee of Aperiodic 2015, Prague, September
	Lead organiser for exhibit at the London Mathematical Society (LMS) 150th Anniversary Mathematics Festival, Science Museum, London, November
Toby O'Neil	Honorary Secretary to Heads of Departments of Mathematical Sciences
Sue Pawley	Organiser of Bletchley Park Masterclass
Phil Rippon	Member of LMS BMC Scientific Committee
Gwyneth Stallard	Chair of the LMS Women in Mathematics Committee
	Member of the LMS Good Practice Scheme Steering Group
	Member of LMS Council
	Member of LMS Programme Committee
	Member of the 2015 L'Oréal-Unesco Women in Science Jury
Bridget S. Webb	Ethel Raybould Visiting Fellow at the University of Queensland, Brisbane, Australia, December to May
	Elected Member of the British Combinatorial Committee
Gareth Williams	Member of the Transpennine Topology Triangle
Robin Wilson	Past President on the Council of the British Society for the History of Mathematics (BSHM).
	Honorary Fellow of Gresham College, London.

Detail from a pictorial representation of J. le R. d'Alembert's "Système des Connoissances Humaines" in the supplement to volume 2 of l'Encyclopédie (1769), mentioning "mixed mathematics" for which Francis Bacon had predicted a great future. From Princeton Companion to Applied Mathematics, p.55.