School of Mathematics and Statistics Newsletter

April 2018

Congratulations…

• (or possibly commiserations) to Mark Chaplain on his appointment as Head of School for 5 years from 1st August 2018.

• to fourth year MMath student Kamilla Rekvenyi on her recent election as the next School President. We wish Kamilla well in her new role.

• to Ewa Bieniecka who successfully defended her thesis 'Commutativity and Free Products in Thompson's Group V' on 3rd April, her defence having been postponed with the external examiner, Andrew Duncan, being unable to reach St Andrews on the original date because of snow.

• to Douglas Howroyd on his engagement to Amber.

Welcome …

• to Richard Glennie as a lecturer in the School. Richard began a 5-year University Fellowship at the start of April, which will be continued as a regular lectureship. Many readers will know Richard from his time as an undergraduate and PhD student at St Andrews.

Conferences organised

• The *British Applied Mathematics Colloquium BAMC2018* took place in St Andrews from 26-29th March, organized by Mark Chaplain, Tommaso Lorenzi and Chandrasekhar Venkataraman with support from other staff and research students. This highly successful Colloquium, which attracted about 300 participants, included an impressive range of plenary speakers, 18 minisymposia, other contributed talks, and with contributions from various staff and research students from the School.

• Isobel Falconer and Alex Craik organised a minisymposium at BAMC2018 on *Conflicting Attitudes in the History of Mathematical Science* for an appreciative audience of about 50. Alex spoke on George Sinclair, and Isobel on Maxwell, Kelvin and the inverse square law. They were joined by Ben Marsden (Aberdeen) on W.J.M. Rankine, and Mark McCartney (Ulster) on James Thomson Senior.

• David Borchers and Janine Illian, in collaboration with Finn Lindgren from the University of Edinburgh, held a 5-day workshop *Spatial Modelling with inlabru* over the Easter break which attracted 30 participants from 8 different countries. This arose from joint EPSRC during which the spatial modelling software *inlabru* was developed. The name *inlabru* comes from (a) the Integrated Nested Laplace Approximation (INLA) methods on which it is built, and (b) that it was developed at two Scottish universities, so when name-thinking we decided to give a nod to another uniquely Scottish product.

Visits and conferences

• Mike Todd was an invited speaker at the conference *New Developments in Open Dynamical Systems and Their Applications* in March at BIRS in Banff (the Canadian one). He gave a talk on 'Slow/fast mixing/escape' (video available at http://www.birs.ca/events/2018/5-day-workshops/18w5061/videos/watch/201803220957-Todd.html) as well as having the opportunity to enjoy one of Heathrow's airport hotels on the way to Canada, as this winter's snow struck again.

- The European Week of Astronomy and Space Science (EWASS) was held in Liverpool from 3rd-6th April. A large contingent from the Solar Group: Patrick Antolin, Ineke De Moortel, Erin Goldstraw, Tom Howson, Duncan Mackay, Paolo Pagano, James Threlfall, Hendrik-Jan Van Damme, attended and gave talks and presented posters. By far and away the highlight was the Solar Group winning the 5-a-side football tournament for the third time in a row, with victories over teams from the UK and Europe!

- Tom Elsden attended the Magnetosphere Ionosphere Solar Terrestrial (MIST) Spring meeting at the University of Southampton, from 26-28th March, giving a talk on 'Field Line Resonances in 3D'

- Collin Bleak gave an invited talk at the University of Florence at the end of March on 'Generalised Ping-Pong Lemmas, and the group of PL homeomorphisms of the unit interval', and such was his success that he has been invited as a plenary speaker for a European Mathematical Society conference *Group Theory in Florence II* in September.

- Jonathan Fraser visited former St Andrews PhD student Sascha Troscheit at the University of Waterloo, Ontario, Canada from 19th-23rd March, where he also gave a talk entitled 'The Assouad Spectrum'.

- The three day meeting at the University of Bristol *Probability, Analysis and Dynamics'18* was attended by some of the Analysis Group: Jon Fraser, Doug Howroyd, Lawrence Lee and Mike Todd. The meeting was a broad one, with talks on Complex Dynamics and Geometry, Ergodic Theory and Dimension Theory, Stochastic Analysis and various aspects of Mathematical Physics.

- In March, Alla Detinko visited the Graduate Center of the City University of New York where she gave an invited talk 'Algorithms for infinite linear groups' at *the New York Group Theory Seminar*. Thereafter, Alla visited Colorado State University at Fort Collins for joint work with Alexander Hulpke on a long-term research project.

- Peter Cameron made a research visit to Portugal in the spring break, where he worked on five different papers with locals and other visitors, and gave a colloquium talk on 'The ADE Affair'.

  On a non-academic visit to the University of Évora, he saw the pictured message in the Hall of Metaphysical Philosophy, which, while possibly bad advice for metaphysicians, is certainly appropriate for algebra.

- Around five staff and five students from the School attended the interdisciplinary *Mathematical Collaboration II* workshop on 7-8th April in the School of Philosophy. Organised by philosophers, the meeting aimed to look at 'social epistemology for mathematics'. It was the first such workshop actually to involve mathematicians (!) and participants remarked on the added benefit this brought. Kamilla Rekvenyi (one of our MMath students) gave a well-received presentation of her work on Paul Erdös, while Peter Cameron, Louis Theran, and Isobel Falconer took part in a panel discussion. Katie McCallum, an Art PhD student from Brighton, contributed an impressive analysis defending mathematicians' use of blackboards!

Visitors

- Rachael Meager, from the London School of Economics and Political Science, visited Dave Miller and on 28th March gave a statistics seminar on 'Aggregating distributional treatment effects: A Bayesian hierarchical analysis of the microcredit literature'.

Grants

- Collin Bleak (PI) and Peter Cameron (Co-I) have been awarded an EPSRC grant for £524,184 for a project 'Bi-synchronizing automata, outer automorphism groups of Higman-Thompson groups, and automorphisms of the shift' commencing upon hiring a postdoc.

- David Borchers has been awarded a 1-year Leverhulme Fellowship for the academic year 2018-19.

Public Engagement

- On 11th April Mark Chaplain gave his Inaugural Lecture 'Mathematical modelling, mutations and metastases: Can we cure cancer with calculus?' to a full lecture theatre. Mark gave an overview of the contribution mathematical modelling is playing in the fight against cancer, and highlighted recent multiscale modelling that is giving real insight into several key processes involved in solid tumour growth and progression. The lecture placed the work in the context of mathematical modelling in general and its history since the foundations of 'the calculus' by Isaac Newton and James Gregory in the late 17th century.

- From 5-16th March, Fiona Macfarlane took part in 'I'm a Scientist: Get me out of here'. This is an online competition where school students from across the UK can meet and interact with scientists from a wide range of fields and career stages. Students challenge the scientists over fast-paced online text-based live chats. They ask the scientists anything they want and vote for their favourite scientist. Fiona was voted into the final three of the Curium zone.

- On 28th March, Tom Coleman and Antonia Wilmot-Smith gave a Mathematics workshop to 60 S1 pupils as part of the University's First Chances Foundation project. They looked at some mathematics of graph theory and how we can use maths to help understand the Sun.

- Jonathan Fraser presented a Masterclass on Fractal Geometry at the University of York on March 17th to a group of secondary school students.

- Tom Elsden and Jonathan Fraser delivered a workshop at a STEM Fair at St Ninian's High School in Glasgow on 13th March.

- To mark *Maths Awareness Month* the Voice of Islam radio station interviewed Isobel Falconer about the History of Maths and the work of the British Society for the History of Mathematics.

Other News

- Isobel Falconer has been appointed a trustee of *The James Clerk Maxwell Foundation*, which exists to honour Maxwell, in particular by developing programmes to encourage young students to become mathematicians, scientists, and engineers, and raising public awareness of the foundations laid by Maxwell for the increasingly pervasive technologies of today. The Foundation owns Maxwell's birthplace in India Street, Edinburgh where displays of Maxwell's work and family history are maintained.

Forthcoming Events

- Our next History of Maths Talk will be Thursday 26th April at 4pm in Lecture Theatre C of the Mathematical Institute. Fenny Smith will be talking on 'So where did our numbers come from anyway?'. Fenny is an independent scholar, Secretary of the British Society for the History of Mathematics, and an expert on Pacioli and medieval mathematics.

Next Issue

- The next edition of the School Newsletter will be circulated in May. Items for inclusion may be sent to schoolnews@mcs.st-andrews.ac.uk at any time but a reminder will be sent out a week before the deadline.