School of Mathematics and Statistics Newsletter

June 2024

Congratulations to ...

• Lauren Sheppard and her husband Daniel on the arrival of Zayla on the 2nd April. Amaya is loving being a big sister. Lauren sends her thanks for the very generous collection and card.

• Laura Johnson, who on 29th May on successfully defended her PhD thesis 'Disjoint and External Partial Difference Families and Cyclotomy'.

• Jordi De Jonghe, who has been awarded a three-year postdoctoral fellowship by the Flemish Research Council to be held at KU Leuven.

Welcome to ...

• all our summer students, nearly 20 of them, who are undertaking a wide range of projects over the summer vacation.

Visitors

• James East from the Western Sydney University is visiting the Algebra and Combinatorics Group from 10-28th June, specifically to work with Nik Ruskuc, James Mitchell and Matthew Brookes. He will give a talk at the fifth Semigroups Day on 14th June. Carl Fredrik Nyberg-Brodda from Seoul and Craig Miller from York will also visit and give talks on the Semigroups Day.

Tom Blyth

• We learnt with sadness of the death of Tom Blyth on 18th May, aged 85. Tom grew up in Fife and read Mathematics at St Andrews before taking his doctorate at the Sorbonne in Paris. He returned to St Andrews as a lecturer in 1963, going on to become professor in 1977. He was Dean of Science from 1994-98, before retiring in 2003. He continued his research on ordered structures and semigroups until not long before his death.

Edith Cormack

• Dr Edith Cormack, who was well-known to longer-standing members of the School and wife of Richard Cormack, Professor of Statistics at St Andrews from 1972 to 1994, died on 3rd June. Edith was a plant ecologist and held a range of positions such as Chair of the Friends of St Andrews Botanic Garden and of the Fife and Kinross Branch of the Scottish Wildlife Trust, as well as a being founding member of the Garden's Education Trust.

Conferences, Talks and Visits

- On 1st June, Peter Cameron and Rosemary Bailey attended a memorial service for Dominic Welsh at Merton College, Oxford. Peter had been Dominic's colleague there for some years, and Dominic taught Rosemary Probability.

  Two amazing coincidences occurred. After the service, former Merton student Chris Palmer talked to Peter, who had tutored him in Pure Maths. Then he said that, whilst a postgraduate at the University of Chapel Hill in North Carolina, he had attended Rosemary's lectures on Design of Experiments. Secondly, in the waiting room at Oxford station, Peter and Rosemary discovered a charity book exchange stall. The books included two on Design of Experiments and one on Combinatorics. One of the former contained the signature 'D. A. Preece'. Donald had done research with both Peter and Rosemary separately before knowing that they knew each other. So they bought the book!

Chris, Rosemary and Peter

- On 18th May, Peter Cameron gave (remotely) the inaugural Colloquium Lecture of the *Academy of Discrete Mathematics and Applications*, which promotes the study of discrete mathematics in India. The talk, titled 'An algebraist looks at discrete mathematics', described three bridges between discrete mathematics and other areas: root systems and graph spectra; the countable random graph and the Urysohn space; and graphs defined on groups.

- Colva Roney-Dougal attended a thought-provoking ICMS workshop on the Lean proof assistant, where she chaired a panel on the use of Lean in mathematics teaching.

- Scott Harper and Stefania Lisai attended the one-day maths education meeting *Threshold Concepts in Mathematics* at Queen Mary University of London on 30th May.

- At the Banff International Research Station workshop *On the Interface of Geometric Measure Theory and Harmonic Analysis* from 9-14th June, John Fraser gave a talk 'Applications of the Fourier spectrum' and Natalia Jurga spoke on 'Dimension theory of parabolic non-conformal iterated function systems'. Several former St Andreans attended, including Sascha Troscheit, Han Yu and Alexia Yavicoli who was one of the organisers. Ana de Orellana, Kenneth Falconer, Lars Olsen and Alex Rutar participated remotely.

- Daphne Lemasquerier, David Rees Jones and Richard Scott gave presentations, with Jean Reinaud also in attendance, at the inaugural *North-East Geophysical Fluid Dynamics* (NE-GFD) meeting on 3rd June at the University of Edinburgh.

- On 4th June Daphné Lemasquerier gave an Applied Mathematics seminar at Durham University on 'Better understanding zonal jets from a wave-mean flow interaction perspective'.

- David Dritschel and Daphné Lemasquerier gave presentations at the workshop *Climate Applications of Layering,* held from 20-24th May at the Isaac Newton Institute in Cambridge as part of the INI programme *Anti-diffusive dynamics: from sub-cellular to astrophysical scales*. Daphné stayed an extra week, and started some work with Pat Diamond (UC San Diego) about quantifying transport across zonal jets for applications to fusion plasmas vs. oceans and atmospheres.

- David Dritschel visited the University of Vienna from 27th May-7th June to work on collaborative research with Professor Adrian Constantin and Dr Pierre Germain.

- On 29th May, Russell Campbell attended the *37th Scottish Fluid Mechanics Meeting* at the University of Edinburgh, where he gave a talk entitled 'A 2D model for the drainage of melt ponds on Arctic sea ice'.

- Jack Reid and Thomas Neukirch attended the UK MHD Meeting 2024 at Coventry University from 5-7th June. Jack presented a poster 'Self-consistent modelling of nano flares: generation of heating and thermodynamic response in 3D MHD' and Thomas gave a talk on 'Magnetic field extrapolation using analytical 3D MHS equilibrium solutions'. One of the invited talks was by former St Andrews undergraduate, Ramada Sukarmadji, who recently successfully defended her PhD thesis.

- From 13-17th May, Cosima Breu attended an ISSI (International Space Science Institute) meeting in Bern focused on *Tracking Plasma Flows in the Sun's Photosphere and Chromosphere: A Review and Community Guide*. In the following week, she visited the *Max-Planck-Institute for Solar System Research* in Goettingen to work on simulations of stellar coronal loops.

Other News

- This week St Andrews launched a new long-term research partnership with NERC's *National Centre for Atmospheric Science* (NCAS). See here for a press release. In connection with this, Daphné Lemasquerier gave a presentation to the NCAS Senior Management Board who visited St Andrews on 5th June, with Richard Scott also attending.
NCAS-St Andrews research will focus on using state-of-the-art digital tools to understand better how the atmosphere and climate work, and how they might change into the future. On the St Andrews side, the partnership is a joint initiative between the School of Mathematics and Statistics and the School of Earth and Environmental Sciences. The partnership will be led by Dr Ioana Colfescu, an NCAS scientist now based at St Andrews and currently sitting in Maths. Later this summer we will begin recruiting research fellows and PhD students to join the team, and will also be spinning up activities to embed NCAS-St Andrews into our School's activities.

- Ursula Martin has been awarded a *Leverhulme Emeritus Fellowship*, which provides travel funding for two years to support her work on 'Bringing artificial intelligence to mathematical practice'.

Next Issue

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