

School of Mathematics and Statistics Newsletter

June 2021

Congratulations ...

- to Natalia Jurga who has been awarded a highly competitive three year *Leverhulme Trust Early Career Fellowship* which she will hold in St Andrews with the Analysis Group.
- to Alex Prokopszyn on successfully defending his thesis ‘Magnetohydrodynamic waves in the solar corona: A mathematical investigation of the role of resonant absorption and phase mixing in coronal heating’.
- to Lawrence Lee for successfully defending his thesis ‘Multifractal measures - from self-affine to nonlinear’. Lawrence is now working at the University of Manchester on an EPSRC Doctoral Prize Fellowship.
- to Gerry O'Reilly on successfully defending his thesis ‘Separability properties of semigroups and algebras’.
- to Meredith Houlton who has been awarded a MSc by Research for a thesis ‘Early Modern Mathematics at St Andrews and Conversions from Euclid in William Sanders’ *Elementa Geometriae*’.
- to Fiona Macfarlane and Han Yu (now in Cambridge) who were both awarded certificates of commendation in the Edinburgh Mathematical Society Thesis Prize competition.

Welcome ...

- to David Pascoe who will be working with Ineke De Moortel on numerical modelling of MHD wave heating. David was a postdoc with Ineke from 2008-2013 and since then has been at the University of Warwick and Katholieke Universiteit Leuven. We welcome him back and look forward to seeing him in the Maths Institute though he will be working remotely for the time being.

Virtual Activities

- Tom Howson, Duncan Mackay, Lilli Nadol, Alex Prokopszyn and Jack Reid ‘attended’ the *UKMHD* meeting on 19th-21st May, held online and hosted by Newcastle University, who were due to host last year before the pandemic forced cancellation. This was the first meeting since that in St Andrews as part of the BAMC in 2018. The UKMHD meeting brings together applied mathematicians and theoretical physicists studying magnetohydrodynamics in the solar, stellar, astrophysical, geophysical, and purely theoretical contexts. Tom contributed a talk on ‘The effects of driving time scales on energy release in the solar corona’ and Jack one on ‘Curved magnetic flux tubes: supporting the spread of an MHD avalanche’.
- Andy Wright gave a seminar ‘What can magnetic helicity tell us about reconnected magnetic fields?’ to the Maths Department at the University of Glasgow on 27th May and a similar talk to the Physics Department at the University of Leicester as part of their *Planetary Seminar Series* on 9th June. Helicity is an elegant way of characterising the topological complexity of a vector field through concepts such as twist, writhe and linkage. Seminal work on magnetic helicity was done in the late 1980s in St Andrews by then postdoc Mitch Berger, now a Professor at Exeter University, and Andy's talk developed ideas that they introduced then.

- Peter Cameron gave an Intensive Course at the *London Taught Course Centre* (the London equivalent of the SMSTC) on 8-9th June. This involved eight lectures between 1pm on Tuesday and 1pm on Wednesday, to an audience of up to 50, almost all PhD students. The topic was ‘Graphs defined on groups’.
- On 2nd June, Martyn Quick attended the *LMS Midlands Regional Meeting*, followed on 3rd-4th June by a *Workshop on Profinite Groups*. These were held at the University of Lincoln, but, due to current circumstances, conducted online.
- Several members of the Analysis Group attended an online meeting on 3rd-4th June featuring talks about fractal geometry by PhD students from the universities of St Andrews, Bristol, Budapest and Oulu. Amlan Banaji gave a talk entitled ‘Dimensions of continued fraction sets’ and Liam Stuart gave one entitled ‘Sullivan’s dictionary and Assouad-type dimensions’.
- Several of the Analysis Group attended the conference *New Frontiers in the Dimension Theory of Dynamical Systems* from 7-11th June which should have been at the Mittag-Leffler Institute in Sweden but, sadly, was moved online. Kenneth Falconer gave the opening lecture on ‘Measures on planar non-conformal attractors’. Much of the conference organisation was done by Tony Samuel, a former St Andrews PhD student, now at the University of Birmingham.
- On 9th June, Fiona Macfarlane ran an outreach Teams event on ‘Using maths to track populations and diseases’ as part of the *First Chances Fife* online summer school programme. The session was attended by 1st year secondary school pupils and gave them an introduction to mathematical biology and its applications.
- Rick Camp gave a talk on ‘Status and conservation of the nightingale reed-warbler in the Mariana Archipelago’ at the virtual *Marianas Terrestrial Conservation Conference* on 8th June.
- Hannah Worthington attended *EURING 2021*, a meeting focussed on statistical methods used to estimate population parameters, held virtually from 31st May-11th June and hosted by Université Laval, in Québec City, Canada. She presented a poster ‘A semi-Markov survival model for ring-recovery data’ which explored modelling age-related changes in survival in bird species (though more broadly applicable to other species) using a very ‘parameter-light’ modelling approach that allows for biological realism with the nice benefit of easy interpretation.
- Deborah Kent spoke on ‘Experimentation and Mathematics: P.G. Tait at the Old Course’ on 8th June at the *Canadian Mathematical Society 75th+1 Anniversary Summer Meeting* in the *History and Philosophy of Mathematics Session*. She also spoke on 15th June at the *Oxford Seminar in the History of the Exact Sciences* on ““The triumphant vindication of the American observations”? The Spanish eclipse expedition of 1870’.
- Isobel Falconer gave an invited talk on 4th June to the *International Conference on the History of Physics* virtual event, to an audience of over 50 people. Her title was ‘To G or not to G: J.H. Poynting and the gravitational constant in the 19th century’.
- As the finale to the *Joint International Staff Training Week: Celebrating University Anniversaries, a Collaboration between St Andrews and the University of Padua*, Isobel Falconer gave the ‘James Gregory’ talk in the public session on ‘Galileo Galilei, James Gregory and the importance of international scientific collaboration’ on 10th June with an audience of around 80.

Visitors

- Rogério Monteiro from the University of São Paulo, Brazil and Alex Aylward from the University of Leeds should have been visiting the History of Maths Group at this time, but unfortunately these visits have had to be postponed. It is very much hoped that it will be possible for them both to visit us sometime in the coming year.

Future Events

- On 12-15th July, St Andrews is hosting (virtually) the joint *British Society for the History of Mathematics/Canadian Society for the History and Philosophy of Mathematics* meeting. Registration is free and all are welcome to attend, see <https://www.bshm.ac.uk/events/people-places-practices-joint-bshm-cshpm-schpm-conference> where there is a link to free registration. There are around 100 talks to choose from, and several speakers are from our School. The meeting is preceded by a satellite meeting on 10-11th July on the *Philosophy of Mathematical Practices*. Some members of the School may remember a previous meeting of this group in February to March 2018. For the programme and details, see <http://www.mcs.st-andrews.ac.uk/bshm-cshpm/index.shtml>

Next Issue

- The next edition of the School Newsletter will be circulated in July. Items for inclusion 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.