

School of Mathematics and Statistics

Newsletter

July 2019

Congratulations ...

- to Eric Howe who successfully defended his PhD thesis entitled ‘Estimating abundance of African great apes’ on 6th June.
- to Erin Goldstraw who successfully defended her PhD thesis entitled ‘Modelling solar coronal magnetic field evolution’ on 19th June.
- to Matt McDevitt who successfully defended his PhD Thesis entitled ‘Orderings on words and permutations’ on 24th June.
- to Jean Rineaud who passed his Habilitation à Diriger des Recherches from the Université de Bretagne Occidentale at the Institut Universitaire Européen de la Mer in Plouzané, France on 18th June.
- to Richard Glennie on the award of a prestigious two year Biometrika Fellowship focused on ‘Statistical inference with stochastic differential equations’. Biometrika Fellowships are awarded as a memorial to the founders of the journal *Biometrika*.
- to Han Yu who has been awarded a prestigious Research Fellowship at Corpus Christi College Cambridge for three years from September 2019.
- to Tom Elsdon who has been awarded a Leverhulme Trust Fellowship. Tom will hold the Fellowship at the University of Leicester, and will continue his line of research with Andy Wright, so we still expect to see him in St Andrews on a regular basis!
- to staff who have been promoted recently: James Mitchell to Professor, Collin Bleak to Reader, Michail Papathomas to Senior Lecturer, Valentin Popov to Lecturer, Danielle Harris and Cornelia Oedekoven to Senior Research Fellow
- to Bernie Roberts on the publication by Cambridge University Press of his new 524 page book *MHD Waves in the Solar Atmosphere*. For details see <https://www.cambridge.org/gb/academic/subjects/physics/solar-and-space-plasma-physic/mhd-waves-solar-atmosphere?format=HB>
- to James Carr who recently graduated with an MA Honours degree in Mathematics and Philosophy and who has been awarded the Miller Prize for the most outstanding student in the Faculty of Arts. He was the first student to complete a joint dissertation between Mathematics and Philosophy, working with Peter Cameron. Next year James will study for a Masters in Logic in Amsterdam.

Welcome ...

- to David Rees Jones who joined the Vortex Dynamics Research Group on 1st July as a new lecturer. David received his PhD from Cambridge and recently was a postdoctoral fellow at Oxford. Now it is time for him to complete the trilogy!
- to Steve Drasco, who will be joining us as an Associate Lecturer (Teaching Focused) in statistics. His research interests include the statistical analysis of gravitational waves, and we look forward to his forming links with colleagues in astrophysics.

Farewell ...

- to Jonathan Hickman who, sadly from our point of view, will be leaving in August to take up a lectureship at the University of Edinburgh after staying with us for only one year of his EPSRC Fellowship. We wish him all the best, though doubtless we will continue to see him from time to time.

Visitors

- Ben Stephenson, a former PhD student at St Andrews and now a lecturer at the University of Auckland, visited St Andrews for two weeks in June to work with David Borchers and PhD students Filippo Francini and Paul Van Dam Bates on method development for acoustic surveys.
- James East from Western Sydney University visited Nik Ruskuc and James Mitchell from 16-30th June to continue different collaborative strands on semigroup congruences, computational techniques, etc..

Visits and Conferences

- Patrick Antolin, Sandra Conde Cuellar, Tom Elsdén, Lianne Fyfe, Erin Golstraw, Thomas Howson, Craig Johnston, Paolo Pagano, Alexander Prokopyszyn, Jack Reid, James Threlfall, Hendrik-Jan Van Damme, Andy Wright and Steph Yardley of the Solar and Magnetospheric Theory Group attended the *National Astronomy Meeting* in Lancaster from 30th June-4th July. A scientific highlight was the session convened by Tom Elsdén and Patrick Antolin entitled ‘Connecting MHD Wave Research from the Sun to the Magnetospheres’. Andy Wright gave a talk in this session on ‘Resonant Fast and Alfvén Wave Coupling in 3D’.



The social highlight was the 6-a-side football tournament. The St Andrews team battled against fierce opposition but their unique blend of European tika-taka and Scottish park-the-bus football won the tournament for the fourth consecutive year. Special mention goes to stunning goalkeeping from an injured James Threlfall, clinical finishing from Paolo Pagano and Andy Wright’s loud and enthusiastic support. St Andrews has now moved clear at the top of the *All Time Winners List* <http://star-www.dur.ac.uk/~bielby/rasnam5.shtml>

- Tom Elsdén attended the *Geospace Environment Modeling (GEM)* conference in Santa Fe, New Mexico from June 24-28th, where he organised a session on the role of dayside kinetic phenomena in driving ultra low frequency waves in Earth’s magnetosphere.
- From 18-20th June, Len Thomas undertook a research visit to Chicago to continue work updating population projections for marine mammals in the Gulf of Mexico after the oil spill. Unfortunately, the latest set of health assessments on bottlenose dolphins in 2018 indicate that things look worse than previously thought. The following week, Len was in Washington DC at a meeting on *North Atlantic Right Whale Health Assessment*. This species migrates up the eastern seaboard of North America and is subject to multiple human-caused stressors including noise, entanglement by fishing (particularly lobster) gear, ship strike and potentially climate change-related changes in food availability. During the meeting, which aimed to come up with a framework for integrating multiple measures of animal health, the news came in that six more of the few hundred remaining animals remaining had been found dead, likely killed by ship strike, casting a cloud over the whole proceedings.

- Andy Lynch presented a poster ‘Low-cost copy number profiling using repeat DNA, with implications for experimental design’ at the *2nd International Cancer Genome Consortium (ICGC) Argo* meeting in Glasgow. This was based on work with Sam Abujudeh, Andy’s last PhD student in Cambridge, who has just passed his viva.
- The *7th Channel Network Conference of the International Biometric Society* was held from 10-12th July at Rothamsted Research in Harpenden, Hertfordshire, to mark one hundred years since the appointment of R. A. Fisher as the first statistician at Rothamsted. Rosemary Bailey gave a talk ‘The design of blocked experiments when the average replication is very low’. Andy Lynch, Nseobong Uto and Hannah Worthington presented posters on ‘Low-cost copy number profiling using repeat DNA, with implications for experimental design’, ‘Semi-Latin rectangles’ and ‘Capture-recapture-recovery models with semi-Markov survival’ respectively. The meeting concluded with the 39th *Fisher Memorial Lecture* given by Alison Smith and Brian Cullis on ‘Design tableau’. This is a method they have developed based on ideas in Rosemary’s book *Design of Comparative Experiments*, to help statisticians and experimenters to specify correctly the appropriate linear mixed model (LMM) to analyse the data from an experiment. Their motivation was the number of elementary mistakes they found made by people using LMM software naively.
- Rosemary Bailey attended the annual *Workshop on Quality Improvement Methods* in Dortmund on 14-15th June where she gave a talk on ‘Blocking in multi-stage experiments’.
- From 23-28th June, Rosemary Bailey participated in the triennial, conference on *Model-Oriented Data Analysis and Optimal Design (mODa2019)*. It was held at the remote Smolenice Castle, the conference centre of the Slovak Academy of Sciences. She opened the conference with her talk on ‘Multi-part balanced incomplete-block designs’. During and after the conference dinner, participants were entertained by a group of five local musicians. They concluded with ‘Auld Lang Syne’, but did not appear to know the words, so Rosemary felt obliged to get up and sing them.
- Mike Todd visited the Sorbonne Université in Paris for a week to work with Viviane Baladi and to speak in the Ergodic Theory seminar there, as well as attending a cocktail party on the top (24th) floor of the Zamansky Tower on the Jussieu campus to celebrate Viviane’s Silver Medal of the CNRS with amazing views across an extremely warm Paris. The following week Mike and Stuart Burrell attended the workshop/school *Thermodynamic Formalism: Modern Techniques in Smooth Ergodic Theory* at CIRM, near Marseille.
- Kenneth Falconer gave an invited lecture at the workshop *Thermodynamic Formalism – Applications to Geometry, Number Theory, and Stochastics*, which also marked the 75th birthday of Manfred Denker, at the Mittag-Leffler Institute on the outskirts of Stockholm from 7-12th July. Tony Samuel, former St Andrews PhD student and now a lecturer at the University of Birmingham, was one of the main organisers of the meeting.
- Nik Ruskuc visited Robert Brignall at the Open University from 8-12th July. Together with David Bevan from Strathclyde they are writing a paper on grid classes of permutations.
- Peter Cameron made a research visit to Lisbon for a week in June; he and his collaborators João Araújo, Wolfram Bentz, and Pablo Spiga made substantial progress on the ‘Road closure conjecture’.
- Collin Bleak was an invited speaker at *Sandgal 2019*, held from June 10-13th in Cremona Italy, where he spoke on ‘The beautiful simplicity of flawless vigorous groups’ describing joint work with James Hyde and Luke Elliot. He then went to Milan from 14-19th June for collaborative work with Francesco Matucci at the Università degli Studi di Milano-Bicocca where he also gave a colloquium talk ‘Rational Embeddings of Hyperbolic Groups’.
- Isobel Falconer visited the Cavendish Laboratory in Cambridge on 8-10th July, where she worked with Malcolm Longair on planning the future of the Cavendish Museum, as well as developing a book proposal.

Public Engagement

- On 28th June Charles Paxton visited the *Church Action for the Homeless* shelter in Perth followed by an afternoon at Perth prison talking about statistics and sea monsters.
- Isobel Falconer attended Manchester University's *Women in Mathematics Day* on 25th June, where she spoke to Year 10 and Year 12 school pupils on 'Female mathematicians in history - known and unknown' and ran a workshop on 'Mathematics in the Ladies Diary'.

Grants and Projects

- Andy Wright has had a proposal approved by the *International Space Science Institute in Bern*, Switzerland to lead a team of 11 scientists who will attend three workshop-style meetings in Bern over the next two years. Their goal is 'The identification and classification of 3D Alfvén resonances' and will bring together theorists and observers.
- Michail Papathomas and Andy Lynch have been awarded a grant from the Melville Trust for a PhD student to look into the question of quantifying and presenting uncertainty in cancer mutational signature analyses. They only learnt in July that they had money for a student who would ideally start in September, so if anybody knows of a promising student ...
- Two undergraduate summer students, Cammy Sriram and Edd Smith, have been working on the D'Arcy Thompson manuscripts in the University Special Collections, investigating where Thompson got his mathematical ideas from. They have added to the D'Arcy Thompson webpages that now represent three years' worth of summer project work: [http://www.mcs-st-and.ac.uk/~dat/index.html](http://www.mcs.st-and.ac.uk/~dat/index.html). Joseph Luke, a Laidlaw scholar, has described his experiences working on the archives of the Royal Observatory Edinburgh investigating the experiences of female 'computers' between 1910 and 1940: <https://laidlawships.wp.st-andrews.ac.uk/2019/06/18/female-computers-at-the-roe/>

Caption Competition

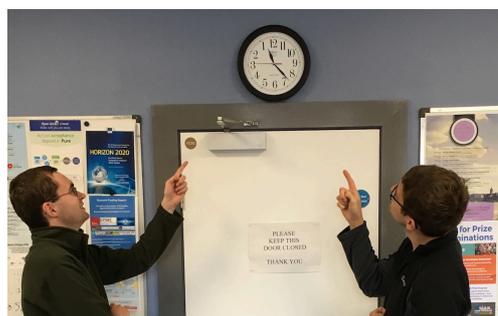


- Captions are invited for the photograph on the left provided by Tricia. Send your suggestions to schoolnews@mcs.st-andrews.ac.uk. The best captions may be included in the next issue of the Newsletter.

- Suggestions for captions for last month's picture shown on the right include:

'But we must keep the clock: I can't remember the time before it was there!' JR

'Recent research into time reversibility – one of the great enigmas of physics' KJF



Next Issue

- The next edition of the School Newsletter will be circulated in August. 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.