School of Mathematics and Statistics
Newsletter

September 2015

Congratulations to …

• John O’Connor and Edmund Robertson for winning the London Mathematical Society Hirst Prize and Lectureship for the History of Mathematics, for their creation, development and maintenance of the MacTutor History of Mathematics website.

• Alan Hood who was awarded the Royal Astronomical Society Chapman Medal for ‘investigations of outstanding merit in solar-terrestrial physics, including geomagnetism and aeronomy’ at the RAS meeting on 8th July.

• Sascha Troscheit who won a £100 prize for the best presentation at the Edinburgh Mathematical Society annual Postgraduate Student Meeting at the Burn in June.

• Cicely Macnamara and James Threlfall who were married in the University Chapel. This was followed by a reception at Dairsie Castle, by all accounts a very splendid event.

• Oliver Allanson and Sophie Dawe who were married on 25th July in the beautiful Llanthony Valley, in the Black Mountains of South Wales very near to where they used to live and go to school.

Farewell and Best Wishes to …

• Ruth and Stuart King who, after 12 years in the School, are moving to the University of Edinburgh where Ruth has been appointed to the Thomas Bayes Chair of Statistics and Stuart to a Lectureship in Applied Mathematics.

• Luke Blackbourn, who was an EPSRC Fellow in the Vortex Dynamics Group, who has moved to the University of Edinburgh to study for a Masters in Computing Science.

• Roland Langrock, who starts as Professor of Applied Statistics at Bielefeld University in Germany in October.

• Abel Farkas, recent PhD in Analysis, who will be spending the next year as a postdoc at Oulu University, Finland and at Brown University, USA.

• Ben Swallow who is starting work at the Atmospheric Chemistry Research Group at the University of Bristol, after successfully defending his PhD in August.

• Not really a goodbye, but Markus Pfeiffer has moved across the car park to Computer Science as a Research Fellow funded by the EU Opendreamkit project.

Welcome to …

• Igor Rivin who has come from Temple University to join us as Regius Professor of Mathematics.

• Gregory Professor, Mark Chaplin, together with other members of the new Mathematical Biology Group: lecturers Tommaso Lorenzi (starting 12th October) and Chandrasekhar Venkataraman (starting 1st October), and postdoc Cicely Macnamara and PhD student Fiona Macfarlane.
• Antonia Wilmot-Smith who returns to St Andrews as a Teaching Fellow for the next three years.
• Lindesay Scott-Hayward who joins us as Teaching Fellow in Statistics.
• New PhD students Thibault Jougla in the Vortex Dynamics Group, working with David Dritschel, and Tom Howson and Erin Goldstraw in the Solar and Magnetospheric Theory Group, working with Ineke De Moortel and Alan Hood. Also to Nayab Khalid and Matthew McDevitt, new Algebra PhD students.
• Gui Bortolotto from Brazil who is starting a joint Statistics and Biology PhD with Len Thomas and Phil Hammond (Biology) modelling factors influencing humpback whale ecology in Brazil, and to Andreia Pereira, joint Lisbon–St Andrews PhD student visiting until at least December, working with Len Thomas and Peter Tyack (Biology) on passive acoustic sensing of fin whale calls.
• Last, but certainly not least, a special welcome and good wishes to our new Head of School, Thomas Neukirch, who took up office on 1st August, along with all those others who have taken on new significant roles in the School.

Recent Visitors
• Rebecca Waldecker from Universität Halle visited Markus Peiffer and Chris Jeffeson to discuss improvements to the partition backtrack and canonical image algorithms for permutation groups.
• Hendrik Weyer from the University of Bremen visited from 3rd-5th June and gave a talk at Pure Postgraduate Seminar.
• In August, David Bolin from Chalmers University, Gothenburg, visited CREEM to work on a joint project with Geosciences in Edinburgh and Charlotte Jones-Todd and Janine Illian.
• Martin Cox, a former PhD student of David Borchers, now at the Australian Antarctic Division in Hobart, visited David for two weeks to finish a paper that has been submitted to Biometrics.
• Theo Michelot, a former summer student of Roland Langrock, is visiting from July to December, to work with Roland on a software package for modelling animal movement, based on research by Roland, Ruth, Len and others over the past few years, in order to make this research accessible to the statistical ecology community.
• Toby Patterson, a quantitative ecologist from CSIRO, Hobart, visited CREEM from April to September, mostly working with Roland Langrock and Len Thomas on hidden Markov modelling of animal movement.
• Theoni Photopoulou, from the University of Cape Town and a former student of Len Thomas, made a brief visit to CREEM in August sponsored by a MASTS early career exchange fellowship.

Meetings organised
• In early July, Monique Mackenzie, Lindesay Scott-Hayward, Rocio Prieto Gonzalez, Tilen Genov and Claudia Faustino formed a major part of the international team that delivered an ‘Introduction to Statistical Modelling’ workshop at the University of Witwatersrand (Wits) in Johannesburg, which taught about 150 people at no cost with a ratio of 10 students per staff member. This was facilitated and partly funded by the Applied Centre for Climate and Earth Systems Science which is itself funded by the South African government via the National Research Foundation.
• The annual International Training Workshop in Distance Sampling was held at the Observatory, 11-20th August, with 24 participants from 12 countries. Instructors included Len Thomas, David Borchers, Laura Marshall, Louise Burt and Eric Rexstad. Among other things, the participants were introduced to Distance 7.0, first major revision of the Distance software in 5 years.
Rosemary Bailey and Peter Cameron, together with Leonard Soicher, organised a memorial day at Queen Mary University of London for Donald Preece, mathematician, statistician, organist, and former St Andrews undergraduate. One of his ‘balanced designs’ is shown above. Each row contains each denomination $A$, 2, 3, ..., 10, J, Q, K exactly once, comprising 3 cards from 3 suits and 4 cards of the other suit; each suit appears in each column with each pair of denominations occurring together in just one column.

Conferences and Research Visits

- Peter Cameron, Sophie Huczynska and Nik Ruskuc attended the 25th British Combinatorial Conference 6-10th July in Warwick at which Nik gave a plenary lecture. Peter is the long-standing Chairperson of the British Combinatorial Committee and Sophie is a Committee member.

- Nik Ruskuc was an invited lecturer at the 53rd Summer School on General Algebra and Ordered Sets, held in Srni, Czech Republic, 29th August-4th September. He gave a series of three lectures on well quasi-orders in combinatorics and algebra.

- Peter Cameron and James Mitchell, with Dugald Macpherson (Leeds), organised an LMS-EPSRC Durham symposium in July, on ‘Permutation Groups and Transformation Semigroups’. Slides and videos of the lectures are available on the Web page http://www.maths.dur.ac.uk/events/Meetings/LMS/2015/PGTS15/ In addition to a full programme of lectures, there was a visit to the Magna Carta exhibition, and an excursion to Robin Hood’s Bay and Whitby (where about 40 participants walked a stretch of the Cleveland Way), as well as time for mathematical discussions: some problems were solved, and new research collaborations begun.

- Markus Peiffer visited the colloquium in honour of Prof Gerhard Hiß’ 60th birthday in Aachen on the 27-28th July.

- Steve Linton, Alex Konvalov, and Markus Peiffer attended the OpenDreamKit Horizon 2020 grant kickoff meeting in Paris on 2nd-5th September.

- The AMS-EMS-SPM Meeting in Porto, 10-13th June was attended by Mike Todd (who organised the special session on ‘Recurrence, Mixing and Fluctuations: Statistics of Dynamical Systems’), Collin Bleak, Casey Donoven, Tom Bourne, Julius Jonusas, Michael Torpey, Sascha Troscheit and Wilf Wilson.

- Whilst in Porto, Mike Todd also visited his collaborators Jorge Freitas and Ana Cristina Freitas, before heading back via a seminar at the University of Lisbon. In June Mike also attended the workshop ‘Stochastic methods for non-equilibrium dynamical systems’ at the American Institute of Mathematics in California. Then in early July, Mike spoke at a special session in Equadiff 2015 in Lyon, during an incredible heat wave outside and no air-conditioning inside. The meeting was enjoyable and interesting nonetheless.
• In July Kenneth Falconer returned from six months in Cambridge after participating in the programme on ‘Random Geometry’ at the Isaac Newton Institute. One unusual highlight was making a short speech on ‘Sierpiński and Fractals’ at the unveiling of the recently ‘planted’ Sierpiński Tree (see picture) by the Polish Ambassador and the Cambridge Vice-Chancellor outside the Centre for Mathematical Sciences.

• Kenneth Falconer, Tom Kempton, Vuksan Mijovic, Mike Todd, and Sascha Troscheit attended the LMS sponsored half-day meeting ‘Fractal Geometry and Dimension Theory’ on 22nd July at the University of Manchester, organized by former PhD student Jonathan Fraser and attended by many others with St Andrews connections. Kenneth gave one of the lectures and all enjoyed wine and food at a reception and dinner afterwards.

• Sascha Troscheit visited former St Andrews PhD Jun Miao at East China Normal University, Shanghai, 29th June – 20th July where he gave a seminar. He also visited Instituto Nacional de Matemática Pura e Aplicada (IMPA) and Universidade Federal do Rio de Janeiro (UFRJ) from 23rd July-31st August, visiting Marcelo Viana, Katrin Gelfert and Manuel Stadlbauer. He gave a seminar at UFRJ and an invited talk at the ‘2nd Workshop on Combinatorics, Number Theory and Dynamical Systems’ at IMPA.

• Isobel Falconer was funded by the British Society for the History of Mathematics to present at the MAA MathFest in Washington DC in August. She spoke on ‘J D Forbes and the Development of Curve Plotting’. She also spoke at the ‘Making of Measurement’ conference in Cambridge in July, talking about ‘Maxwell, Cavendish, and the Inverse Square Law of Electrostatic Attraction’. In collaboration with the BSHM, Isobel is organising a conference in St Andrews, 16-17th September next year, on ‘Mathematical Biography - a MacTutor Celebration’.

• In June Rosemary Bailey visited TU Dortmund where she took part in the 14th Workshop on Quality Improvement Methods, continued her research with Joachim Kunert on crossover designs, and gave a seminar on ‘Designs for variety trials with very low replication’.

• Rosemary Bailey was the principal organizer of the workshop ‘Design and Analysis of Experiments in Healthcare’ at the Isaac Newton Institute, Cambridge, 6-10th July 2015. See https://www.newton.ac.uk/event/dae0w07 This follow-on to the 2011 INI programme was attended by about 60 people from industry and academia. Rosemary’s own talk was on ‘Designs for dose-escalation trials’. The following week she attended the conference ‘Simple Groups, Representation, and Related Ropics’ in honour of Martin Liebeck and Jan Saxl, also in Cambridge.

• Janine Illian had a busy summer as an invited speaker at the Nordic Biometric Meeting, Reykjavik and GRASPA 2015, Bari, Italy in June, and at AMLGM, Trondheim and GeoMed 2015, Florence in September. She also presented three posters at the Scottish Crucible Forum in Edinburgh in September.

• David Borchers, Steve Buckland and Ben Stevenson gave invited talks at the Joint Statistical Meetings conference in Seattle (probably the largest statistics conference in the world, with up to 45 parallel sessions at once!). Ben’s invitation was a consequence of him winning an American Statistical Association prize for best statistical software paper – dealing with a software package that he has written as part of his PhD.

• Roland Langrock organized two sessions on statistical ecology at the annual meeting of the German Statistical Society in Hamburg, with David Borchers, Charlotte Jones-Todd and Théo Michelot giving invited talks.
• David Borchers visited the University of Cape Town (UCT) for two weeks, to work with his joint St Andrews and UCT PhD student, Greg Distiller, and to develop joint research with the newly-established Centre for Statistics in Ecology, the Environment and Conservation http://seec.uct.ac.za/index.php at UCT, where he now has an honorary position. David was also a key speaker at the Wildlife Photo-ID Network workshop in Helsinki in August.

• David Borchers, Peter Jupp, Rachel Fewster (Auckland), Ben Sevenson and Peter Nightingale (Computer Science) spent a research-productive week at a retreat on Loch Torridon, as part of a Marsden research grant on which Rachel is PI and David and Peter Co-Is. An ill-considered bet on the progress that would be made in the week led to David, Ben and Peter having to go for a swim in the Loch (but it was worth it!).

• David Borchers and Janine Illian participated in the EPSRC Impact Acceleration Account Showcase in the Gateway in the summer, David presenting work done in collaboration with HiDef Digital Surveying Ltd. and Janine work on spatial modelling of crime events.

• Joyce Yuan attended the Spatial Statistics conference in Avignon to present joint work with Janine, David and researchers from Bath, as part of their EPSRC grant ‘Modelling spatial distribution and change from wildlife survey data’.

• Tiago Marques spent August in the Norwegian high Arctic surveying polar bears, using helicopters deployed from boats. Tiago is now starting analysis of the data which should be concluded in a few months. Information on the survey can be found at http://www.npolar.no/en/expedition-field/polar-bear-survey-2015/

• Around 50 members of the National Centre for Statistical Ecology gathered for their biennial summer meeting at the Penryn (Falmouth) campus of Exeter University. The programme included research talks, in sub-tropical conditions, from Steve Buckland, Charlotte Jones-Todd, Rocio Prieto Gonzalez, Ben Stevenson and Joyce Yuan.

• Peter Jupp attended the Leeds Statistics Workshop on ‘Geometry-driven Statistics and its Cutting Edge Applications’ in July where he gave a lecture on ‘A General Approach to Symmetric Distributions’. In September he gave a keynote talk entitled ‘Directional Statistics in the Geosciences’ at the International Association for Mathematical Geosciences meeting in Freiberg, Saxony.

• In June Magda Carr travelled to the University of Bergen was PhD opponent for Hilde Kristine Hvídevold’s thesis ‘Quantifying uncertainties when monitoring marine environments in connection with geological storage of CO2’.

• Jean Reinaud gave an invited talk during the 26th General Assembly of the International Union of Geodesy and Geosciences held in Prague, 22nd June-2nd July, in a symposium dedicated to ‘Oceanic Submesoscales’.

• Ineke De Moortel gave an invited review talk at the 42nd European Physical Society Conference on Plasma Physics in Lisbon, 22nd-26th June, on ‘Transverse, Propagating Velocity Perturbations in Coronal Loops’. She also contributed a talk ‘Mode Coupling in Coronal Loops’ and an e-poster ‘Joint SDO/AIA and IRIS Observations of Propagating Coronal Disturbances’ at the Hinode-9 meeting in Belfast, 14-17th September.

Grants

• Congratulations to Mark Chaplain and the Mathematical Biology Group who, with partners in the University of Glasgow, have just been awarded a four year £2m grant as part of the recent EPSRC Mathematics for Healthcare initiative for a project ‘EPSRC Centre for Multiscale Soft Tissue Mechanics (SoT Mech) with Application to Heart and Cancer’.
**Other News**


• Kenneth Falconer visited Milton Keynes in July in a new role as External Examiner for the Open University MSc in Mathematics.

**Future Events**

• Alexander Konovalov is organiseing the First CoDiMa Training School in Computational Discrete Mathematics at the University of Manchester on November 16th-20th 2015. It will start with the 2-days hands-on Software Carpentry workshop covering basic concepts and tools, including working with the command line, version control and task automation, continued with introductions to GAP and SageMath systems, followed by lectures and exercise classes on topics in computational discrete mathematics. See [http://www.codima.ac.uk/events/](http://www.codima.ac.uk/events/)

**Next Issue**

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