

MATHEMATICS AND STATISTICS NEWSLETTER

Spring 2014

WELCOMES & GOODBYES

- Welcome to Dr Tom Kempton who joined the Analysis Group in January to work with Kenneth. Tom did his PhD in Warwick and comes to St Andrews from Utrecht where he had a first postdoc appointment.
- Farewell to Max Neunhöffer who left us to work with the company triAGENS in Cologne.

CONGRATULATIONS

- Congratulations to Darren Kidney for successfully defending his PhD thesis on ‘Random coefficient models for complex longitudinal data’.
- Congratulations to Solmaz Eradat Oskoui on the successful defense of her PhD thesis on ‘New Aspects of Particle Acceleration in Collapsing Magnetic Traps’.
- Congratulations to Roland Langrock for being appointed to a lecturer in Statistics in January 2014.
- Congratulations to Alexander Konovalov who has been selected as a Fellow of the Software Sustainability Institute: <http://software.ac.uk/fellows/alexander-konovalov>. The SSI Fellowship programme (<http://www.software.ac.uk/fellowship-programme>) is set up to promote best practices in scientific software development, so if you are using software in your research and need any advice, please ask Alexander. A particular task in which he would be involved as a Fellow is to promote the <http://recomputation.org/project>.
- Congratulations to Peter Cameron whose fifth grandchild Charles Anderson was born on 18th February.

GRANTS & PRIZES

- Tara Brough was awarded two LMS small grants: a Scheme 2 (Visits to the UK) grant for Bob Gilman (Stevens Institute of Technology, USA) to visit St Andrews (2nd-5th June), Warwick and Newcastle; and a Scheme 4 (Research in Pairs) grant for me to visit Laura Ciobanu at the University of Neuchatel in Switzerland.
 - Together with Barbara Bogacka (QMUL), Holger Dette (Ruhr-Universität Bochum) and Ralf-Dieter Hilgers (RWTH, Aachen), Rosemary Bailey was successful in applying to the Isaac Newton Institute, Cambridge, for the funds and facilities to hold a one-week workshop on Design and Analysis of Experiments in Healthcare there in July 2015.
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SEMINARS, LECTURES & CONFERENCE TALKS

- Roland Langrock gave five invited seminars on his work on hidden Markov and related models, at the Universities of Kent, Oldenburg, Southampton, Ulm and Aberdeen. He also led a two-day invited workshop on hidden Markov models at the University of Glasgow.
- Ineke De Moortel gave an invited review talk on ‘Wave Heating in the Solar Corona’ at the 7th Hinode Meeting held in Takayam, Japan, on 11th-15th November.
- On 12th November Stuart King gave a seminar in the University of Strathclyde on ‘Advanced computational methods for stratified flows’.
- Tara Brough gave two seminars. Firstly a talk on ‘Solvable poly-context-free groups’, for the Group Theory International Webinar, in December. Then a seminar on ‘Group word problems related to the context-free languages’ at the University of Oxford, in October.
- The SICSA (Scottish Informatics and Computer Science Alliance) DEMOfest took place in Glasgow on 5th November. Alexander Konovalov, Arunas Prokopas and Bilal Hussain were representing CIRCA there.
- Michail Papathomas attended ERCIM 2013, the 6th International Conference on Computational and Methodological Statistics in UCL, London in December. He talked on ‘Using the Dirichlet process clustering model to assist the investigation of high order interactions and explore graphical linear models.’
- In December, Kenneth Falconer and Mike Todd attended a workshop on Hyperbolicity and Dimension at CIRM (Centre International de Rencontres Mathématiques) at Luminy, just outside Marseille. Kenneth gave an invited talk and all enjoyed the magnificent limestone coastal scenery close to the Centre.
- In January Isobel Falconer gave an invited lecture on James Clerk Maxwell and the Cavendish Laboratory to a large (200+) audience in Cambridge, which included demonstrations of some of Maxwell’s original apparatus. She also talked on a similar topic to the Cafe Scientifique in Leamington Spa in March.
- Kenneth Falconer gave a Probability Seminar at Cambridge in late January. Whilst in Cambridge he attended a graduation ceremony to take his MMath degree - 39 years after passing the notorious ‘Part III’ exam which has recently been accorded MMath degree status!
- Mike Todd was an invited speaker at a February workshop at the London Mathematical Society headquarters, part of the Mathematics for the Fluid Earth programme.
- In March Michail Papathomas talked at the Medical Research Council conference on Biostatistics, at MRC Cambridge on ‘The utility of the Dirichlet process clustering model for the exploration of high order interactions; advantages and limitations.’
- On 7th March, Alex Craik took part in a seminar on the history of mathematics at the Institut Henri Poincaré in Paris, where he lectured on ‘Calculus and analysis in Britain, 1790-1820 : the French connection’. Then, on 4th April, he took part in a one-day meeting in Edinburgh to celebrate the 400th anniversary of the first publication of John Napier’s work on logarithms. There, he gave a short talk on ‘Knott, Sang and Spence on logarithmic and other tables’.
- Vasilis Archontis attended the Royal Society Research Fellows Conference 2014, on 19th – 20th March, held at the Royal Society, London.

- Several members of the Analysis Group participated in the major international conference ‘Fractal Geometry and Stochastics’, held in Tabarz in the Thuringen Forest in Germany during the last week in March, for which Kenneth Falconer was one of the three organisers. Casey Donovan, Kenneth Falconer, Abel Farkas, Tom Kempton and Sascha Troscheit all gave talks as did several former members of the School.
- In early April, Kenneth Falconer gave a talk ‘A Very Short Introduction to Fractals’ at the Edinburgh Science Festival, followed by a signing session of his new book with the same title.
- On 5th May, Mike Todd gave a talk entitled ‘Teichmüller flow on the space of translation surfaces: towards statistical properties’ at the Federal University of Bahia (UFBA) in Brazil - part of his month-long research visit there.
- Ineke De Moortel has been awarded the Lord Kelvin Award Lecture 2014. The lecture on ‘Our Dynamical Sun: A 21st Century View’ will be delivered at this years British Science Festival, which will take place in Birmingham, from 6th to 11th September.
- Alexander Konovalov gave two talks in February. Firstly about the HPC-GAP project at the Glasgow Parallelism Group seminar on February 5th. Then a talk about the Recomputation.org project at the Scottish Programming Languages Seminar in Dundee on February 26th.
- Janine Illian attended various conferences, including the 6th Trondheim Symposium in Statistics, Selbu in October; the Scottish International Policing conference, Edinburgh, in November - presenting a poster ‘Predicting crime through spatial modelling’; she was an invited speaker at the CEH Edinburgh, annual meeting, in January, and at the ENAR conference, Baltimore, in March, and again at the ‘Advancing Software for Ecological Forecasting’ meeting, at the University of Illinois, Urbana-Champaign, USA.
- Janine Illian gave seminars at Southampton University, in February; at the University of Illinois, Urbana Champaign, in March; and at Stirling University, in April.
- Peter Cameron talked to the Mathematics Colloquium in Leeds on 2nd April and the Bristol Algebra Day on 22nd April.
- Monique MacKenzie gave a talk at the Environmental Interactions of Marine Renewable Energy Technologies (EIMR) conference (<http://www.eimr.org/web/>) in Stornoway at the end of April outlining how newly developed methods are finding use in environmental impact assessment for offshore wind farms (and wave and tidal installations). These methods are now guidance for good practice based on commissioned research work for Marine Scotland (carried out under contract at CREEM).
- Rosemary Bailey attended the 6th International Conference of the ERCIM Working Group on Computational and Methodological Statistics, which was held in London from 14th to 16th December. Rosemary organized a session on ‘Software for design and analysis of experiments with many factors’. The talks in this session were as follows: RAB: Desmond Patterson and the design key. Hervé Monod: Automatic and flexible generation of regular factorial designs and its implementation in R. Marion Chatfield and Simon Bates: An algorithm for constructing a mixed model using the experimental design. Heiko Großmann: A tool for automating the analysis of variance of orthogonal designs.
- Rosemary Bailey attended the American Mathematical Society’s Special Session on Algebraic Methods in Graph Theory and Combinatorics, which was held in Knoxville, Tennessee from 21 to 23 March 2014. She was the plenary speaker in this session, and spoke on ‘Products of association schemes’.

- Rosemary Bailey gave four other recent talks. Firstly on 16/10/13 she gave the Coulter–McDowell lecture at Royal Holloway, University of London. This annual lecture is hosted by the Mathematics Department and is intended to be accessible to non-specialists. Rosemary spoke on ‘Latin squares’. Next Rosemary gave a talk on ‘Entropy, partitions and association schemes’ at the half–day meeting on ‘Network coding, partitions and security’ held on 20/11/13 in the School of Engineering and Computing Sciences at the University of Durham. Then on 23/1/14 she spoke to the Highlands Local Group of the Royal Statistical Society on ‘From Rothamsted to Northwick Park: Designing experiments to avoid bias and reduce variance’. Then finally on 1/5/14 Rosemary was the outside speaker (and judge of the PhD students’ posters) at the annual Research Day of the School of Mathematics, Statistics and Applied Mathematics at the National University of Ireland at Galway. She spoke on ‘Circular designs balanced for neighbours at distances one and two’.

RESEARCH VISITS & VISITORS

- Visitors to the Analysis Group over the past few months have included former PhD students Jonathan Fraser (Warwick) and Tony Samuel (Bremen) as well as Henna Koivusalo (York), Dan Thompson (Ohio) and Sandro Vaienti (Marseille/Toulon).
- Janine Illian made a number of research visits. Firstly to Haavard Rue’s group at NTNU Trondheim (Norway) in October, November and February and April (funded by NTNU). To NINA (Norsk institutt for naturforskning) Trondheim, in November and February. To Finn Lindgren, Bath University, in December. To David LeBauer, University of Illinois, Urbana Champaign, USA, in March; and also to Rosa Crujeiras, at the University of Santiago de Compostela, Spain, in December, examining a PhD viva while there.
- Tara Brough visited Bob Gilman and Alexei Miasnikov (and Paul Schupp, who was also visiting) at the Stevens Institute of Technology in Hoboken, USA from 13th–20th November. While there she gave a talk on ‘Poly-context-free groups and semilinear sets’.
- In December (9th–13th) Hannah Worthington visited the University of Canterbury to work with Dr Rachel McCrea.
- Dr Tibor Torok from Predictive Science Inc., San Diego, visited the solar group in April, and gave a seminar on ‘Sympathetic eruptions, electric current neutralization in active regions, and ‘Thermodynamic’ MHD simulations of the Bastille Day event’. A collaboration has recently been set up between the Solar Theory Group and Predictive Science Inc. to study solar jets, in particular a newly found type of jet known as a ‘blowout jet’.
- The solar group also had several other visitors. Dr Richard Morton visited from Northumbria University, and spoke on ‘Alfén wave heating: Insights from observations of the chromosphere’. Dr Antonia Savcheva visited from the Harvard-Smithsonian Centre for Astrophysics, and spoke on ‘Solar sigmoidal active regions: from formation to eruption’. Finally Dr Francesco Zuccarello from KU Leuven, visited, speaking on ‘The role of flux cancellation and of the torus instability in the initiation of CMEs’.
- Dr Maximilien Gadouleau from the University of Durham visited for the week 17th–21st February and worked with Peter Cameron and James Mitchell.
- Monique MacKenzie visited Olympia, Washington State, US in March. This was to attend the MOCHA (<http://www.creem.st-and.ac.uk/mocha/>) meeting and work with marine

mammal scientists using methods she has recently co-developed to detect behavioural responses to naval sonar.

- In March, Mike Todd spent a month at the International Centre of Mathematical Sciences (ICMS) in Edinburgh as part of a Research in Groups activity on Escape of Mass and Conditional Limit Laws, working alongside Henk Bruin, Mark Demers and Roland Zweimüller.
- Alexander Konovalov had three visitors. Firstly Dmitrii Pasechnik and Edith Elkind from Oxford visited on 14th–18th April. Then Leo Margolis from Stuttgart visited from 20th April–2nd May. Leo Margolis' visit was supported by the Edinburgh Mathematical Society.
- In April Monique MacKenzie visited researchers at the Department of Statistical Sciences at the University of Capetown (Asoc Prof. Res Altwegg and Dr Ian Durbach) to set up a research plan and also met with researchers at the Council for Scientific and Industrial Research (CSIR) in South Africa (Capetown) and the Centre for High Performance Computing (CHPC; <http://www.chpc.ac.za/>) and the Applied Centre for Climate and Earth Systems Science (ACCESS; <http://www.access.ac.za/>) to discuss co-ordination with statistical training online materials (both existing and awaiting development).
- Prof. Allen Herman (<http://www.math.uregina.ca/~aherman/>) from the University of Regina, Canada, will spend 6 months of his sabbatical in St Andrews from October 1st, 2014 to March 31st, 2015. Allen visited St Andrews this summer for Group St Andrews 2013 and also played several very successful rounds of golf on Balgove and Strathtyrum courses. Recently he became the contributor to the GAP package Wedderga (<http://alexk.host.cs.st-andrews.ac.uk/wedderga/>) and during his sabbatical he will be working in group rings jointly with Alexander Konovalov.
- Karen Meyer made a six week research visit to the Harvard-Smithsonian Center for Astrophysics in Boston in October/November last year. During that time she gave an invited seminar at NASA Goddard Space Flight Center in Greenbelt. Duncan Mackay and Karen also hosted Dr Antonia Savcheva from the Center for Astrophysics for a week from 31st March–4th April.
- Rosemary Bailey made two recent research trips. Firstly Rosemary spent 19/10/14 to 9/11/14 at the University of South Australia, continuing her research with Chris Brien into various aspects of multi-tiered experiments. During the visit Rosemary gave a UNISA Statistics seminar on 'Circular designs balanced for neighbours at distances one and two'; She participated in a meeting of the Advisory Board of the Phenomics and Bioinformatics Research Centre; Rosemary also spent a day with a small team conducting its annual census of malleefowl nests in a certain area. Next Rosemary spent the last week of November at the Universidade de Beira Interior in Covilhã, Portugal, where she is doing research with Sandra Ferreira, Dario Ferreira and Celia Nunes into strange things that can happen in the analysis of a designed experiment even when all model matrices commute with each other. While there, Rosemary gave an intensive short course on 'Structures defined by factors'.

WORKSHOPS, SUMMER SCHOOLS & EVENTS ORGANISED

- Janine Illian and Anthony Overstall jointly organised the RSS/Highland meeting in November.

- Vasilis Archontis gave two invited reviews. Firstly at the ISSI workshop ‘The solar activity cycle: physical causes and consequences’ Bern, Switzerland, from 11th to 15th November 2013, he spoke on ‘Magnetic flux emergence as a driver of solar dynamic events’. Then he attended the Mini-Workshop: ‘Sun-to-Earth Analysis of an Extreme Space Weather Event’, at the Department of Physics, University of Ioannina, Greece 9th–10th January 2014, speaking on ‘Dynamics of solar magnetic fields’
- Duncan Mackay organised a one–day RAS discussion meeting on ‘The life of solar prominences, and space weather’ in London on February 21st. The meeting was attended by over 50 people.
- Alexander Konovalov attended the Higher Education Academy workshop ‘E-Assessment in the Mathematical Sciences: Finding the Formula for Success’ at Middlesex University on 9th April. He also attended the ‘Promoting learning through technology’, meeting organised by the Institute of Physics Higher Education Group (see the programme at http://www.iop.org/activity/groups/subject/hed/calendar/info/file_61273.pdf) in Edinburgh on October 23rd. The Microsoft Azure for Research training event in Manchester on April 3rd–4th. Finally as a Fellow of the Software Sustainability Institute, Alexander went to Oxford to the Software Sustainability Institute’s annual Collaborations Workshop on 26th–27th March and the Hackday on March 27th–28th and gave two mini–talks there.

OTHER NEWS

- Rosemary Bailey is a member of the Fisher Memorial Committee. One thing that the committee does is organize public lectures on topics cognate to R. A. Fisher’s research interests. The 33rd Fisher Memorial Lecture was given by Professor Bill Hill of the University of Edinburgh on ‘Applying quantitative genetic and genomic information to animal improvement’ on the 8th January as part of the PopGen47 meeting in Bath.
- In early December 2013 Rosemary Bailey was part of the team reviewing the position of Statistics within the School of Mathematics at the University of Edinburgh.
- Janine Illian is jointly supervising a Marie Curie post-doc, Alicia Ledo with Prof. David Burslem, Aberdeen; Alicia will be based in Aberdeen.
- Peter Cameron appeared in a debate about the concept of infinity for the Institute of Art and Ideas which is now available to watch online at <http://iai.tv/video/the-infinite-puzzle>.
- You can now follow the GAP system news on Twitter: http://twitter.com/gap_system.

NEXT ISSUE

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