

# MATHEMATICS AND STATISTICS NEWSLETTER

Winter 2012/13

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## CONGRATULATIONS

- The 2013 Royal Astronomical Society (RAS) Group Achievement Award (G) will be awarded to the UK MHD Consortium. This award recognises outstanding achievement by large groups where it is not appropriate to present, jointly, one of the other awards of the Society. The UK MHD Consortium is led by Alan Hood and provides HPC on the parallel computer for researchers from the universities of Glasgow, Newcastle, UCLaN, Leeds, Sheffield, Manchester, Bradford, Warwick, Cambridge, QMUL and Exeter. A certificate will be presented to the group leader at the National Astronomy Meeting on July 1<sup>st</sup>–5<sup>th</sup> this year, to be held in St Andrews!
- Ruth King and Antony Overstall secured a consultancy contract with National Records Scotland (NRS) of £5,128 to conduct a preliminary investigation into ‘Capture-Recapture Models for Population Estimates’.
- Congratulations to Colva Roney-Dougal on her re-election to the Council of the London Mathematical Society.
- Congratulations to Roland Langrock, who together with his co-authors Iain MacDonald (University of Cape Town) and Walter Zucchini (University of Goettingen), was awarded with the Herbert Sichel medal for the best statistical paper published by a member of the South African Statistical Association in 2011. The title of the paper is ‘Some nonstandard stochastic volatility models and their estimation using structured hidden Markov models’, and it appeared in the Journal of Empirical Finance.
- Congratulations to David Borchers and Ben Stevenson, who were successful with a small grant (£500) to the University’s Enhancement Themes Funding Call to develop formative assessment material to give undergraduate statistics students practice in formulating real-world problems as well-posed statistical problems. The grant includes testing the efficacy of the material on some undergraduate volunteers. David has also been awarded an Overseas Travel Grant (£2,570) by the Royal Society of Edinburgh to visit former St Andrews student Assoc. Prof. Rachel Fewster at the University of Auckland, to collaborate on developing capture-recapture methods in the presence of uncertainty about recaptures. Uncertainty is often present when individuals are not physically captured, but are instead detected by means of genetic samples, photographs from camera traps or acoustic detection, for example.
- Congratulations to Janine Illian who was awarded two Scottish Crucible grants for multi-disciplinary projects (‘Space to Pace; making Scottish green space accessible’ (CI) and ‘Preventing crime through spatial modelling’ (PI)).
- Congratulations to Glenna Nightingale who successfully defended her PhD thesis, ‘Bayesian point process modelling of ecological communities’, jointly supervised by Janine Illian and Ruth King.

- Congratulations to Fiona Wilson, who defended her PhD thesis ‘Equilibrium and Stability Properties of Collisionless Current Sheet Models’ on 28<sup>th</sup> November.
- Congratulation to Nina Menezes, who successfully passed her PhD viva on 18<sup>th</sup> December, entitled ‘Random generation and chief length of finite groups’.
- Congratulations to Nabilah Abu-Ghazalh, who defended her thesis ‘Finiteness conditions for unions of semigroups’ on 19<sup>th</sup> December.
- Congratulations to Simon Craik, who defended his thesis ‘Ends of Semigroups’ on 15<sup>th</sup> January.
- Congratulations to Markus Pfeiffer, who defended his thesis ‘Adventures in Applying Iteration Lemmas’ on 16<sup>th</sup> January.

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## WELCOMES & GOODBYES

- Welcome to Professors Rosemary Bailey and Peter Cameron, who will join us part-time from 1<sup>st</sup> March 2013.
- Farewell to Xavier Perrot who returns to France after finishing his Marie Curie fellowship.
- A renewed welcome to Xiong Jin, who, after completing his Royal Society International Fellowship has become a Temporary Lecturer in the School.

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## SEMINARS, LECTURES & CONFERENCE TALKS

- David Borchers gave an invited talk on spatially explicit capture-recapture methods at The Wildlife Society Conference in Portland, Oregon, in October, and a seminar on the same topic at the University of Kent at Canterbury later that month.
- Stacy DeRuiter gave two talks at Calvin College Mathematics and Statistics Colloquium, firstly on 18<sup>th</sup> October a talk entitled ‘Statistical modelling to understand how beaked whales respond to naval sonar’, and then on 27<sup>th</sup> November a talk entitled ‘Models and statistics to understand marine animal behavioural responses to ocean noise’. Stacy then gave a talk at Hope College on 30<sup>th</sup> November on ‘Measuring how marine mammals change their behavior in response to noise’ in the Biology Department seminar series.
- Yue-Kin Tsang attended the American Physical Society, Division of Fluid Dynamics 65<sup>th</sup> Annual Meeting in San Diego in November. He presented a talk there on ‘Ellipsoidal Vortices Beyond the Quasi-geostrophic Approximation’.
- Janine Illian attended the Scottish Crucible Alumni meeting at the Scottish Government in Edinburgh on November 6<sup>th</sup>.
- Rob Schick attended the Annual Meeting of the North Atlantic Right Whale Consortium in New Bedford, MA, USA on November 13<sup>th</sup> and 14<sup>th</sup>, presenting a talk entitled ‘Using effort, sightings, and body condition data to estimate survival and health of individuals and the entire right whale population’. At the meeting, he was also nominated and elected to the board of the RWC.
- Janine Illian was an invited speaker at the University of Miami Spatial Statistics Conference, in Miami in December.

- In December, Anthony Overstall gave a talk entitled ‘A Strategy for Bayesian Inference for Computationally Expensive Models with Application to the Estimation of Stem Cell Properties’ at the University of Southampton.
- Kenneth Falconer, Jonathan Fraser, Xiong Jin and Abel Farkas attended the conference ‘Advances on Fractals and Related Topics’ in Hong Kong during the second week in December. Kenneth gave the opening plenary lecture and Jonathan and Xiong gave talks. Jonathan combined the trip with a visit to East China Normal University in Shanghai where he gave a seminar and Xiong went on to Beijing to give a talk at Tsinghua University.
- Colin Campbell attended the 22<sup>nd</sup> Nikolaus conference in Aachen from 7<sup>th</sup>–9<sup>th</sup> December. The Nikolaus conference is an annual meeting at Lehrstuhl D für Mathematik, RWTH Aachen.
- Ruth King was invited to present a talk at the annual ‘Soay sheep meeting’ at the University of Edinburgh on the 10<sup>th</sup> December.
- Michail Papathomas attended the Bayesian methods in Biostatistics and Bioinformatics conference in Barcelona from 17<sup>th</sup>–19<sup>th</sup> December, and gave a talk there entitled ‘Using the Dirichlet process clustering model to assist graphical linear model selection: investigation of high order interactions between environmental/genetic covariates’.
- Tara Brough gave two talks, firstly at the Auckland Computer Science Theory Colloquium, Auckland University of Technology, entitled ‘Semigroups with rational word problem’, on 17<sup>th</sup> December. Then at the University of Newcastle, Australia, entitled ‘Automaton semigroup constructions’, on the 24<sup>th</sup> January.
- In January Mike Todd gave a seminar at the University of Warwick entitled ‘Dynamical systems with holes: escape rates, equilibrium states and dimension’.
- Mike Todd was an invited speaker at the conference ‘A Week on Dynamical Systems at IM-UFRJ’ in Rio de Janeiro in January.
- On 25<sup>th</sup> January, David Dritschel presented a seminar on ‘Two-dimensional magnetohydrodynamical flows at zero Prandtl number’ at the Department of Physics, Queen Mary University London.

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## RESEARCH VISITS & VISITORS

- George Phillips visited Turkey for two weeks in November 2012, supported by Tubitak, giving two lectures at both Dokuz Eylul and Mugla Universities.
- Nik Ruskic visited the Open University to work with Robert Brignall (former Ph.D. student) and Michael Albert, 17<sup>th</sup>–20<sup>th</sup> October, and York University from 21<sup>st</sup>–23<sup>rd</sup> January, to work with Victoria Gould. He also hosted several visitors; Gracinda Gomes (from Lisbon, former Ph.D. student of John Howie, 3<sup>rd</sup>–7<sup>th</sup> December), Victoria Gould (from York, 6<sup>th</sup>–7<sup>th</sup> December), and Peter Mayr (from Linz, 10<sup>th</sup>–17<sup>th</sup> December).
- Rob Schick undertook research trips to Sarasota, FL and to Boston, MA.
- Len Thomas made several research visits: to Lisbon, in October with Danielle Harris to discuss progress with our Portuguese and American partners on estimating whale numbers from their sounds (Cheap DECAF project); to Aix-en-Provence in December to participate

in the first meeting of a new working group looking (PELAGIC) looking at methods for determining where to put marine reserves in the face of huge uncertainty; and to Sarasota in January to a meeting on methods for assessing population consequences on the dolphins there of boat traffic disturbance (PCADs working group). He also presented findings from CREEM's various US Navy-funded research projects at a program review of the Navy's Living Marine Resources program in Port Hueneme, California in October. Len reports that it was nice to spend all of November in Fife.

- Members of CREEM had several visitors; Alison Johnston from the BTO visited Steve Buckland and Phil Harrison in October, Cameron Walker from the University of Auckland visited Monique MacKenzie, Carl Donovan and Lindesay Scott-Hayward in November. Finally Dave Miller from University of Rhode Island, visited CREEM in December.
- Janine Illian visited Haavard Rue's group in Trondheim, Norway twice, in November and January.
- Tara Brough visited Murray Elder at the University of Newcastle, Australia, from 22<sup>nd</sup> – 25<sup>th</sup> January.

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## WORKSHOPS, SUMMER SCHOOLS & EVENTS ORGANISED

- A 2-day workshop was held at CREEM on 26<sup>th</sup> and 27<sup>th</sup> September, organised by C. Donovan, C. Harris, J. Harwood & F. Samara (by alphabetical order, certainly not by level of contribution). The workshop was on the modelling of animal movement and funded by Natural Environment Research Council Marine Renewable Energy Knowledge Exchange Programme (NERC-MREKE) and Marine Scotland. The intention of this workshop was to bring together representatives of the marine renewables industry, organisations that provide complementary systems (particularly sound propagation models and individual-based movement models) and experts in the modelling of the movement and behaviour of large marine organisms to share expertise and establish a common ground for future impact assessments. More than 30 attended overall and each day comprised of presentations and small-group discussions. A great deal of common ground was established and key areas for future research identified. The workshop is part of a larger grant and research is ongoing, building on the information gathered and collaborations formed during the workshop.
- In November, Louise Burt and David Borchers participated a workshop at Duke University on developing methods for estimating the abundance and distribution of sea turtles off the US east coast.
- Janine Illian organised a joint meeting with the Royal Statistical Society's Highland group on the 21<sup>st</sup> November. The speakers were Tony O'Hagan, University of Sheffield, Mark Brewer, BIOS, Aberdeen, and Alan Gelfand, Duke University, Durham, USA.

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## OTHER NEWS

- Ruth King was external examiner on the 17<sup>th</sup> October for the PhD thesis 'Bayesian Analysis of Multi-species Demography: Synchrony and Integrated Population Models for a Breeding Community of Seabirds' by Jose Lahoz-Monfort at the University of Kent.
- Kenneth Falconer was the 'Opponent' at a PhD defence in Helsinki in late October. This was a highly theatrical event with everyone dressing up and with the Opponent and Candidate, kept apart by 'Mr Custos', arguing about the thesis for a couple of hours in front of an audience of 50, not all mathematicians. Afterwards there was the traditional 'Karonkka' - a lavish dinner given by the Candidate in honour of the Opponent at which everyone made speeches saying how wonderful everyone else was. A few weeks later Kenneth was in Bristol, again for a PhD exam, but of a rather more conventional form. Kenneth combined these PhD examiner visits with presenting seminars at the universities.
- Kenneth Falconer has been appointed to the EPSRC Peer Review College.
- David Borchers would like to remind everyone that **28<sup>th</sup> February is the deadline** for proposals to the James Clerk Maxwell AIMS Fund to support short courses by staff or postgrads at any of the African Institute for Mathematical Sciences (AIMS) centres (in South Africa, Ghana and Senegal) in 2013/14. Application is via this website: <http://www.icms.org.uk/workshops/aimsjcmf>. Feel free to contact David to find out more and/or discuss any ideas you have in this regard, no matter how vague or tentative they may be. The presentation that Prof. Berndt Schroers (the Chair of the Fund) gave in St Andrews in November, can be found here: <http://www.creem.st-and.ac.uk/dlb/temp/temp.html>.

## NEXT ISSUE

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