School of Mathematics and Statistics Newsletter

December 2017

Congratulations…

• to Cristina Evans who successfully defended her thesis 'Modelling Subsurface Hydrology in Riparian Environments' on 5th December.

• to our Undergraduate Maths Society SUMS who won £1,000 in a competition *Opportunity Challenge* run by PricewaterhouseCoopers (PwC). The competition is to raise awareness of PwC and employment possibilities with them among university students. A PwC team visits roughly 25 universities nationwide to hold a quiz for any willing societies in each university. The quiz was quite light-hearted, with rounds on General Knowledge, News from 2017, Entertainment, and Company Logos. The SUMS team, of Tim Bailey, Max Holtzmann and Toby Parker, won by 1.5 points, and as a result will travel to PwC's London office in February to compete against the winning teams from other universities for a chance to win a further £5,000.

   SUMS has yet to decide on how it will use the money, but hope to be able to be more ambitious in inviting speakers from further afield, raising awareness of the society, and helping it to grow in membership over the coming years.
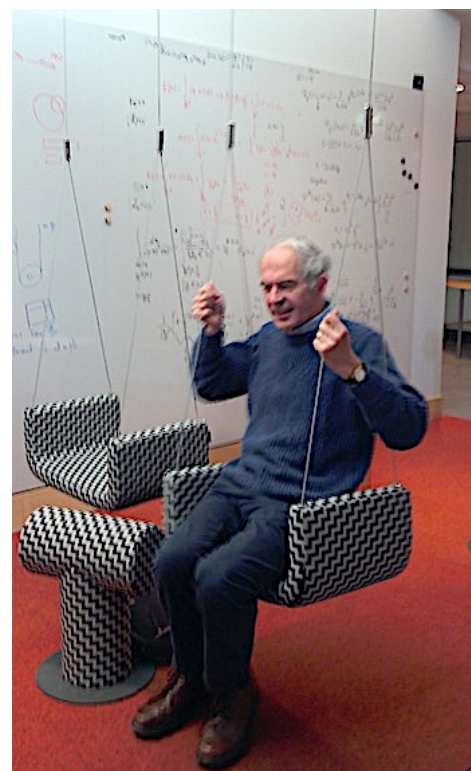
Farewell…

• to Jonathan Hodgson, who is leaving to take up a job south of the border early next year. Jonathan came to St Andrews in 2008 as an undergraduate and went on to complete his PhD last year. We wish him well in his future career.

Visits and conferences

• Nik Ruskuc visited Peter Mayr at the Colorado University at Boulder 20-30th November, to continue their work on subdirect products in Algebra. Prior to that, Nik visited former colleague and Head of School Mike Atkinson in Dunedin, New Zealand.

• Present and past School members were well-represented at the *Workshop on Fractals and Dimensions* at the Mittag-Leffler Institute in Stockholm from 4-8th December. Stuart Burrell, Kenneth Falconer, Jon Fraser, Doug Howroyd, Lawrence Lee and Han Wu all gave talks at the workshop which was particularly aimed at research students.

• On 17th November Kenneth Falconer gave a seminar at the University of Uppsala, a university founded in the 15th century which retains many picturesque old buildings. But the mathematics building is new, and an interesting feature in the common room area are the swings on which one can relax whilst contemplating the mathematics written on the surrounding white boards – there is also a see-saw!

Swings are an essential requirement for every new maths building – pictured are those at the University of Uppsala

Peter and Rosemary taking time off during their visit to China

- Rosemary Bailey and Peter Cameron spent three weeks in November visiting Yaokun Wu and his Combinatorics research group at Shanghai Jiao Tong University. The Group includes Eiichi Bannai, famous for his 1984 book with Tatsuro Ito on Algebraic Combinatorics, who joined the Group when his Japanese university forced him to retire on grounds of old age, and Sergey Goryainov, a new postdoc recently arrived from Russia. Peter gave a short course on 'Permutation groups and transformation semigroups' and a separate seminar on 'Foldings of de Bruijn graphs'. Rosemary gave a short course on 'Relations among partitions'. They interacted with many PhD students, and started a new research project with Sergey on equitable partitions of Latin-square graphs.

   They stayed in a hotel in central Shanghai very near to the tomb of Xu Guangqi, a 17th century mathematician, astronomer, agronomist and military strategist who was the first translator of Euclid's *Elements* into Chinese. The whole group made a five-day excursion to Hangzhou, where an International Workshop on Bannai-Ito Theory was held at Zhejiang University. Peter gave a talk on 'Synchronization and separation in the Johnson scheme' and Rosemary spoke on 'Products of association schemes'. There was time to visit the beautiful West Lake and see various temples, pagodas and parks.

- Colva Roney-Dougal gave a departmental colloquium at the Catholic University of Louvain, invited by Pierre-Emmanuel Caprace.

- Louis Theran gave a mini course on 'Global rigidity and graph realization' as part of *Journées de Géométrie Algorithmique 2017*, https://jga2017.sciencesconf.org

- Mun See Chang, Markus Pfeiffer and Colva Roney-Dougal attended the *Nikolaus Conference 2017* at RWTH Aachen on 8-9th December. Mun-See gave a talk entitled 'Computing normalisers in permutation groups' and Colva spoke on 'Random presentations with all relators of length k'. Former St Andrews lecturer Max Neunhoeffer was also there.

- Markus Pfeiffer visited Nicolas Thiery at Université Paris-Sud on 27-28th November to work on dependently typed interfaces between computer algebra systems. Along with Chris Jefferson he also visited Rebecca Waldecker and her group in Halle from 29th November-7th December to work on their ongoing project developing permutation group algorithms.

- Janine Illian visited Daniel Simpson at the University of Toronto and, on St Andrews day, gave a seminar entitled: 'Nessie, seals and all that – spatial modelling for ecological surveys from a Scottish perspective'. She was also an invited speaker at the [Inferential Challenges for Large Spatio-Temporal Data Structures](#) workshop at the Banff International Research Centre from 3rd-8th December with a talk entitled 'Spatial modelling for ecological surveys – contributions from and to point process modelling'. Janine also visited Scandinavia where she spoke at the kick-off meeting of the project 'Models of heterogeneity, contextuality and self-interaction in ordered spatial point patterns with applications to animal movement and forest inventory (ordSpat)' funded by the Academy of Finland in Helsinki, and, with Olly, attended the workshop *Points in Time and Space* on the occasion of Jesper Møller's 60th birthday in Aalborg, Denmark.

- Cornelia Oedekoven and Steve Buckland gave a tutorial on 'Bayesian methods for hierarchical distance sampling models' to the German Region of the *International Biometric Society* in Hanover on 7-8th December.

- Magda Carr attended a workshop on *Nonlinear Water Waves: an Interdisciplinary Approach* at the Erwin Schroedinger Institute in Vienna from 27th November-2nd December.

- Patrick Antolin was invited to the Centre for Fusion, Space and Astrophysics (CFSA) of the University of Warwick on 4-5th December to give a seminar entitled 'Reconnection microjets in the solar corona'.

- Andy Lynch attended the *European Bioconductor Meeting 2017* on 5-6th December in Cambridge.

- On 7th December Michail Papathomas attended the *LMS/EMS Good Practice Scheme Workshop* in Edinburgh, on good practice with regard to PhD and staff recruitment, and also on Athena SWAN applications.

Visitors

- Dave Miller was visited by Julie van der Hoop of Århus University, Denmark to work on modelling fish energetics.

- Fabio Reale from the Università degli Studi di Palermo visited the School from 27-30th November to work with members of the Solar Group. Whilst in St Andrews Fabio gave a seminar on 'Coronal Loop Modelling'.

- Mathieu Morvan, a PhD student from the Institut Européen de la Mer, Brittany, France, visited David Dritschel and Jean Reinaud from 2nd-29th November to work on theoretical aspects of the nonlinear interactions between two oceanic vortices. This is part of a long-term and ongoing collaboration between the Vortex Group and a team of physical oceanographers led by Xavier Carton in France.

- Derek Holt visited St Andrews for three days, to continue his work with Steve Linton, Markus Pfeiffer and Colva Roney-Dougal on computing with finitely-presented groups.

- Madeleine Whybrow visited Markus Pfeiffer from the 20-24th November to continue their work on constructing Majorana algebras.

Public Engagement

- Colva Roney-Dougal, along with Marcus du Sautoy and Nick Evans, appeared on In Our Time with Melvyn Bragg on Radio 4 on 30th November. The topic was Carl Friedrich Gauss, see http://www.bbc.co.uk/programmes/b09gbnfj

Grants

• Rebecca Waldecker, Chris Jefferson and Markus Pfeiffer have secured a grant from the Volkswagen Stiftung in Germany to fund a postdoc based in Halle, Germany for 18 months, see http://www.verwaltung.uni-halle.de/dezern3/Ausschr/17_1598.pdf

Other News

• Colva Roney-Dougal, together with co-organisers Martin Liebeck (Imperial), Kay Magaard (Arizona), Britta Spaeth (Wuppertal) and Pham Hu Tiep (Rutgers), have been allocated a 6 month programme at the Isaac Newton Institute, Cambridge, on *Groups, Representations and Applications: New Perspectives*.

Future Events

• Mark Chaplain will give his Inaugural Lecture on Wednesday 11th April 2018 – colleagues are encouraged to note the date in their diaries.

Next Issue

• The next edition of the School Newsletter will be circulated in January. 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.

A Happy Christmas to all our readers (both of them)!