

March 2015 Newsletter

Mathematics and Statistics

Emeritus Professor

Congratulations to Douglas Bridges who was awarded the title of Emeritus Professor by the University Council on 25 February. Douglas is planning to retire in April.

Callaghan Innovation R & D Career Grant

Congratulations to Steve Manion (PhD 2015 in Computational and Applied Mathematics) who has won a Callaghan Innovation R & D Career Grant to join as a senior research consultant with Wynyard Group's research team (<https://www.wynyardgroup.com>). He will be using his expertise in natural language processing and statistical machine learning (skills gained during his PhD studies) to help fight crime.

- Raaz Sainudiin

Welcome to our New Postgraduate Students



Maojun Wang completed his undergraduate and Master's degrees at St Andrews, Scotland between 2010 and 2014. Four years' study experience in Scotland gave him great confidence in statistics and now he is embarking on PhD study with Jennifer Brown and Daniel Gerhard. Maojun's research interest is environmental monitoring, in particular by using spatial statistics and the aspects of adaptive sampling to develop optimal network designs for environmental monitoring.

Lisa Hall is studying for a MSc in Applied Statistics under the supervision of Elena Moltchanova, Alex James, and Sharyn Goldstien (Biological Sciences). Lisa enjoys working with numbers and graphs and has an interest in ecology and conservation, so she'll be studying quantitative population modelling of Orange Roughy. Her outside interests include music, movies, Riccarton Bush market, pub quizzes and Spongebob Squarepants. Her non-statistical goal for the year is to try all the flavours at the new gelato shop at the mall!



Allanah Kenny began as an Engineering student but found Maths was the most enjoyable part, so after her first year she switched to a BSc (Mathematics) with some minor courses in Linguistics and Japanese. She completed her BSc (First Class Hons) last year and has since done a Summer project with Tim David and Mike Plank. She's now a Masters student, again with Tim David and Mike Plank, starting research on neurovascular coupling in the brain and working on the neurovascular unit (NVU) model with the team based at Bluefern, UC. When not working, she enjoys shopping, reading, TV and yoga.

Rory Ellis completed a PG Dip. Sci. (Statistics) last year and is currently working on a Master's project under the supervision of Marco Reale and Chris Price. His topic is graphical modelling, in particular, examining the different edge deletion tests from a meteorological context to see where the dependencies and relationships are occurring between different variables. Rory's aim next year is to continue his studies in Wellington, where he hopes to have a 2-year study/intern role with Metservice. Rory is a sports enthusiast at heart but has also participated in U-Can-Speak, Toastmasters, UC Meditation and the UC Spanish Club.



Research Tip of the Month

Don't let things sit on the shelf! If that piece of work is almost finished, then put aside a day or two to do the final touches and get it submitted somewhere. You can only get credit for something that's "in preparation" when you are a PhD student!

- Alex James

Welcome to our School Visitors

Visitor	University	Host	From	To	Room	Extn
Magnus Bordewich	Durham, UK	C Semple	5.1.15	4.4.15	607	8875
Ina Deutschmann	Germany	M Steel	25.1.15	29.4.15	616	8876
Elisa Kasbohm	Germany	M Steel	25.1.15	29.4.15	616	8876
Iosif Petrakis	Munich	M McKubre-Jordens	25.2.15	28.3.15	710	7694
Richard Law	York	M Plank	16.3.15	16.5.15	605	8028



'Networks of Life'

The 'Networks of Life' Biomath meeting was held at the University's marine field station in Kaikoura from 8 – 13 February. The week-long meeting was attended by around 20 researchers, students, and postdocs from a variety of places.

- Mike Steel

Maths Induction Session

The new semester started with the now traditional induction session for students enrolled into 100-level Maths and Stats courses. The aim of the session was to introduce students to each other and the school, and to tell them about the courses and future career choices as well as showing them how Learn and Maple TA work. A few decided to enrol into MATH120 while there's still time. Around 300 students attended the session. Big thanks to Liz Ackerley, Hilary Seddon, Brendan Creutz and Helen Rowley, who helped Elena Moltchanova and Maarten McKubre-Jordens to organize it.

- Elena Moltchanova

Postgraduate Seminars

The Statistical Consulting Unit, together with the Postgraduate Office, is organizing its traditional series of seminars for postgraduate students interested in data analysis. The topics include exploratory data analysis and basic statistical concepts and tests, generalized linear regression and analysis of variance, as well as introduction to Bayesian modelling and WinBUGS software. The theoretical part of the seminar is followed by labs with R or SPSS. To enrol, or ask for more information, please contact the Postgraduate Office.

- Elena Moltchanova

Papers Submitted

- Bernstein, D.I., Ho, L.S.T, Long, C., Steel, M. St John, K. and Sullivant, S. (2015). *Bounds on the expected size of the maximum agreement subtree*. (to SIAM J Discr. Math.).
- Francis, A. and Steel, M. (2015). *Which phylogenetic networks are merely trees with additional arcs?* (to Syst. Biol.)
- Gascuel, O. and Steel, M. (2015). *A 'stochastic safety radius' for distance-based tree reconstruction* (to Algorithmica).
- Hosking, R.: *Solving Sangaku with Traditional Techniques*, submitted for a book called *Proceedings of the Takebe Conference 2014* to be published in 2016 by the Mathematical Society of Japan (MSJ) in the series *Advanced Studies for Pure Mathematics (ASPM)*.
- Montelle, C. and Plofker, K.: *The transformation of a handbook into tables: The Brahmatulyasāraṇī and the Karaṇakutūhala of Bhāskara*, submitted to SCIAMVS (Jan 2015), 34pp.
- Sober, E. and Steel, M. (2015). *Similarities as Evidence for Common Ancestry — A Likelihood Epistemology* (to British J. Phil. Sci.).
- Steel, M. (2015). *Self-sustaining autocatalytic networks within open-ended reaction systems*. (to J. Math. Chem.).

Papers Accepted

- Bajri, S., Hannah, J., and Montelle, C.: *Revisiting Al-Samaw'al's table of binomial coefficients: Greek inspiration, diagrammatic reasoning and mathematical induction*, Archives for History of Exact Sciences, (accepted Jan 2015) 41pp.
- Hannah, J. and Montelle, C.: *Drawing it Out! The History of Mathematics through its diagrams*, in Amy Shell-Gellasch and Dick Jardine (eds) *MAA Notes Volume: The Courses of History: Ideas for Developing a History of Mathematics Courses*, (accepted Feb 2015), 17pp.
- Montelle, C.: *The production of sines Bhāskarācārya's Jyotpatti*, Bhāskara 900 International Conference proceedings, Thane, India (accepted Jan 2015) 11pp.
- Sainudiin, R., Thatte, B., and Veber, A.: *Ancestries of a Recombining Diploid Population*, Journal of Mathematical Biology, 43 pages, 2015. Their topologically consistent model is necessary to capture the ancestries of the recently approved "three-person babies" in the UK (<http://www.bbc.com/news/health-31594856>) with implications for personalized medicine.

Papers Published

- Francis, A.R. and Steel, M. (2015). *Detecting reticulate evolution using distance measures*. Math. Biosci. 259: 12-19.
- Gravel, S. and Steel, M. (2015). *The existence and abundance of 'ghost' ancestors in biparental populations*. Theor. Pop. Biol. (in press).
- Koh N-T.: *Hereditary Convexity for Harmonic Homeomorphisms*, Indiana University Mathematics Journal, vol. 64 (2015), 231 – 243.
- Lad, F., Sanfilippo, G., and Agro, G.: *Extropy: Complementary Dual of Entropy*, Statistical Science, downloadable at <http://projecteuclid.org/current/euclid.ss>
- Sainudiin, R., Stadler, T. and Veber, A.: *Finding the Best Resolution for the Kingman-Tajima Coalescent: Theory and Applications*, Journal of Mathematical Biology, vol. 70, issue 6 (2015), pages 1207 – 1247.
- Scotland, R.W. and Steel, M. (2015). *Circumstances in which parsimony but not compatibility will be provably misleading*. Systematic Biology (in press).
- Sober, E. and Steel, M. (2015). *How probable is common ancestry according to different evolutionary processes?* J. Theor. Biol. (in press).
- Steel, M. (2015). *Reflections on the extinction-explosion dichotomy*. Theor. Pop. Biol. (in press).

Conferences and Visits

Hannes Diener: gave a talk titled *The Searchability of Cantor Space* at the Constructivism and Computability Conference in Kanazawa, Japan, 2 – 6 March. He will also be giving a talk titled *Continuity is overrated (... sometimes)* at a special session on Constructive Mathematics at the 2015 North American Annual Meeting of the Association for Symbolic Logic (ASL) in Illinois from 25 - 28 March. He will then make a research visit to Helmut Schwichtenberg at the University of Munich from 1 – 9 April. His travels are primarily funded by a CORCON grant.

Jeanette McLeod: gave two talks - *Explorations in Graph Theory* and *Epidemic Spread in Possum Networks* - at a 3-day research meeting that was funded by and located at the University of Auckland from 18 – 20 February.

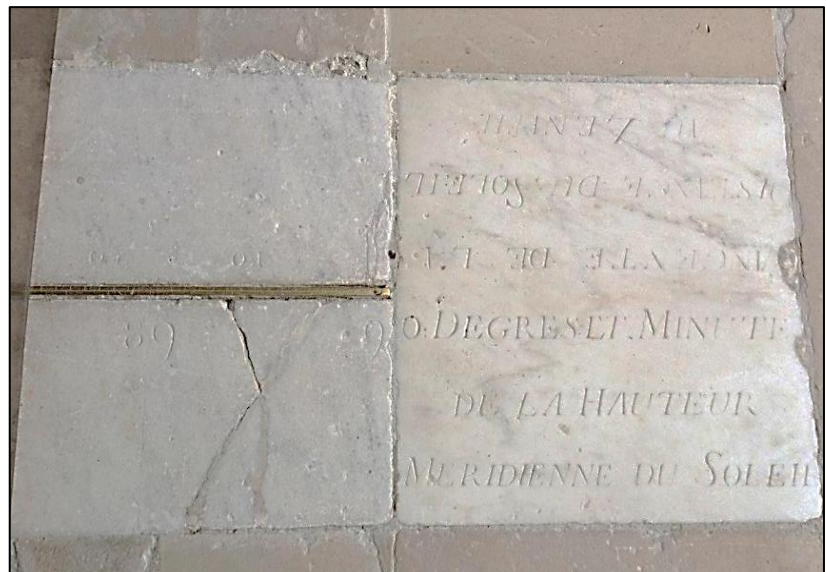
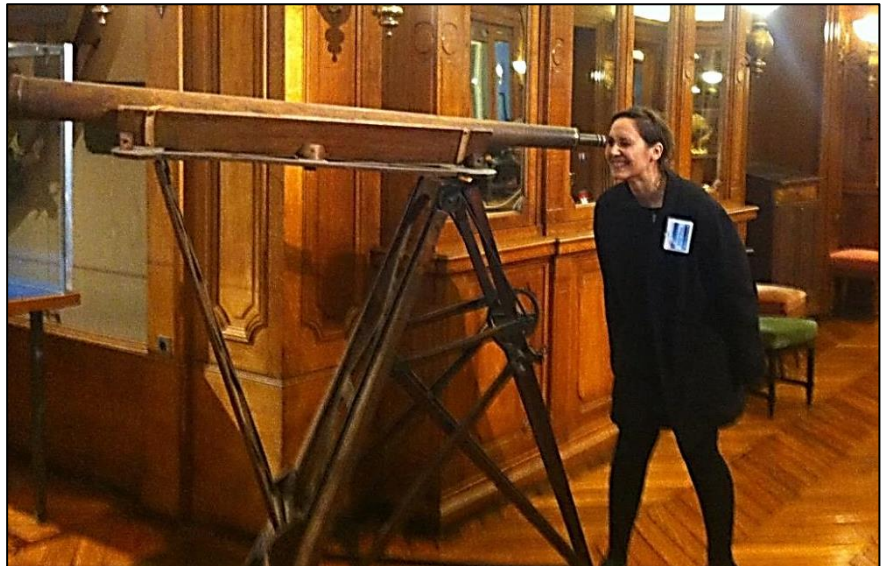
Michael Plank: gave a talk titled *Size spectrum models of fish community dynamics and their exploitation* at NIWA in Wellington on 2 March.

From **Clemency Montelle** in France, some photos of L'Observatoire de Paris, where she was guided by the legendary Suzanne Debarbat, a retired astronomer who started working there in 1952.

Right: Clemency inspecting the telescope used by the Cassinis and Laplace.

Below: Southern Hemisphere star map mounted in a gilded frame.

Below right: the meridian line (line of longitude) in the Great Hall.



News from the Library

- To recommend books to the Library, send the details to the Library Liaison Officer for Mathematics and Statistics, Assoc. Professor Marco Reale <http://bit.ly/1zwYHKa>
- New titles for Mathematics and Statistics <http://bit.ly/NVj1hV>; for Mathematical Statistics <http://bit.ly/MIS2WA>; new-titles-list generator <http://bit.ly/1brT13E>

From the Web

In Memoriam (Blog on Math Blogs) <http://bit.ly/1vhENyG>

1. Math and the Genius Myth (Blog on Math Blogs) <http://bit.ly/1KBDI3k>
2. Disciplines That Expect 'Brilliance' Tend to Punish Women, Study Finds (Chronicle of Higher Education) <http://bit.ly/1AlhsDk>
3. Math for Your Ears [podcasting] (Blog on Math Blogs) <http://bit.ly/1EJNV4M>
4. Math Is Beautiful, But Is It Art? (Scientific American) <http://bit.ly/1vqNrRo>
5. The Stuff of Proof (3:AM Magazine) <http://bit.ly/175MIKE>
6. Why Do We Pay Pure Mathematicians? (Math with Bad Drawings) <http://bit.ly/1weP2Vo>
7. 4 Ways Copyright Law Actually Controls Your Whole Digital Life (Consumerist) <http://bit.ly/169TjCF>
8. Think You 'Own' What You 'Buy' on the Internet? (Politico Magazine) <http://politi.co/1uS1TMj>
9. The Cobweb: Can the Internet Be Archived? (New Yorker) <http://nyr.kr/1uS11Y2>
10. Google Boss Warns of 'Forgotten Century' with Email and Photos at Risk (Guardian) <http://bit.ly/1Fg6ZuT>
11. Never Trust a Corporation to Do a Library's Job [Google's ahistoricity] (The Message) <http://bit.ly/1A83le5>
12. Why Digital Natives Prefer Reading in Print. Yes, You Read That Right (Washington Post) <http://wapo.st/1D8HICq>

And on the lighter side...

- How Long Can We Survive a Zombie Invasion? (plus.maths) <http://bit.ly/1HV0TIZ>
- Five Incredible Archimedes Quotes (Fake Science) <http://bit.ly/1zIWwBa>

John Arnold | Mathematics/Statistics Liaison Librarian

Crusaders' fans came out to play when team members and cheerleaders visited UC!

