

Centre for Research in Mathematics Newsletter

University of Western Sydney

Seminars & Colloquia

- Dr Murray Elder from University of Newcastle talked about “Computing with Infinite Groups” at UWS on 4th November 2013.
- Paul Grassia from University of Manchester visited UWS on 1st November and gave a talk titled “Three Films Good, Four Films Bad”.
- Prof. Michael P. Polis from Oakland University, USA presented a seminar on “Voltage Robust Stability in Microgrid Power Management” at UWS on 31st October 2013.
- Ngamta (Natalie) Thamwattana from University of Wollongong visited our Centre on 30th October and talked about “Mathematical modelling in nanotechnology”.
- Prof. Georg Gottwald from University of Sydney talked about “Homogenisation for deterministic maps and multiplicative noise” on 21st October 2013.
- Anthony Henderson from University of Sydney presented a seminar on “Geometric modular representation theory” at UWS on 19th August 2013.
- Amnon Neeman from Australian National University gave a seminar on “Residues and duality in algebraic geometry” on 5th August 2013.
- James Mitchell from University of St Andrews gave two talks on 5th July 2013. The topics were “Computing with finite semigroups” and “The lattice of subsemigroups of the semigroup of all mappings on an infinite set”.

Visitors to the Centre

- Prof. Michael P. Polis from Oakland University, USA visited Prof. Wei Xing Zheng from 29th October to 1st November, 2013.

Recent activities of members

- **Andrew Francis** was invited to give a seminar in Monash University on 17th October.
- **Wei Xing Zheng** was appointed as an Associate Editor of IEEE Transactions on Automatic Control in June 2013.
- **Wei Xing Zheng** attended the 3rd Australian Control Conference (AUCC’2013) in Perth, WA and presented a paper.
- **Sangeeta Bhatia, Attila Egri-Nagy, Andrew Francis and Stuart Serdoz** attended the Phylomania conference held at University of Tasmania in Hobart. All of them presented their work at the conference.
- **Sangeeta Bhatia, James East, Attila Egri-Nagy, Andrew Francis, Leanne Rylands, Stuart Serdoz and Stephen Tawn** attended the 57th AustMS conference held from 30th September to 3rd October. They also presented their work in the conference.
 - James East gave a talk on *Idempotent generators in partition monoids* in the session on Group Actions.
 - Attila Egri-Nagy gave a talk on *Intervals in Finite Groups* in the session on Group Actions.
 - Andrew Francis gave two talks in the conference. His first talk was on *Subgroup Majorization* in Algebra session. The second talk was on *Group theoretic models of the inversion process in bacterial genomes* in the session on Mathematics in Biology and Medicine.
 - Stephen Tawn talked about his work on *Normal forms of random braids* in Algebra session.
 - Sangeeta Bhatia gave a talk on *Group theoretic formalization of the Double cut and join model of chromosomal rearrangement* in the session on Mathematics in Biology and Medicine.

Recent papers accepted

- **Ahlip R.** and Rutkowski M., “Forward start foreign exchange options under Heston’s stochastic volatility and the CIR interest rates.” appeared in *Inspired by Finance*.

- **James East**, “Infinity minus infinity” to appear in *Faith and Philosophy*.
- Patrick Dehornoy and **Volker Gebhardt**, “Algorithms for Garside calculus” to appear in *Journal of Symbolic Computation*.
- **Volker Gebhardt** and Stephen Tawn, “Normal forms of random braids” to appear in *Journal of Algebra*.
- **R. Hazrat**, “Leavitt path algebras are graded von Neumann regular rings” to appear in *Journal of Algebra*.
- S. Ding and **W. X. Zheng** “Controller design for nonlinear affine systems by control Lyapunov function” appeared in *Systems and Control Letters*, Vol. 62, No. 10, pp. 930-936.
- Y. Yi, **W. X. Zheng** and L. Guo, “Improved results on statistic information control with dynamic neural network identifier” to appear in *IEEE Transactions on Circuits and Systems-II: Express Briefs*, Vol. 60, No. 11
- W. X. Zhao, **W. X. Zheng** and E.-W. Bai, “A recursive local linear estimator for identification of nonlinear ARX systems: Asymptotical convergence and applications” to appear in *IEEE Transactions on Automatic Control*, Vol. 58, No. 12
- S. Ding, S. Li and **W. X. Zheng**, “New approach to second-order sliding mode control design” to appear in *IET Control Theory and Applications*, Vol. 7, No. 18

Looking further ahead

- Wei Xing Zheng is on the organizing committee of the 53rd *IEEE Conference on Decision and Control (CDC'2014)* which will take place in December 2014 in Los Angeles, California, USA.
- Andrew Francis will visit *London School of Economics* and *St Andrews University, Scotland* in December.

- Andrew Francis will visit the following institutions in January 2014: *University of Hertfordshire, University of Amsterdam, ETH Zurich and University of Leeds*.
- Andrew Francis has been invited to attend the *Kaikoura Workshop* being organized from 10th February to 15th February, 2014 by the University of Canterbury Biomathematics Research Centre in Christchurch, New Zealand.
- Roozbeh Hazrat has been invited as a research guest to *Max Planck Institute, Bonn* in December 2013.
- Roozbeh Hazrat will visit *Institut des hautes études scientifiques (I.H.É.S.)*, Paris in January 2014.

CRM Researchers

- Dr Rehez Ahlip
- Sangeeta Bhatia
- Dr James East (Project Lead, Diagram Algebras and semigroups)
- Dr Attila Egri-Nagy
- Prof Andrew Francis (Project Lead, Algebraic Biology)
- Dr Volker Gebhardt (Project Lead, Group theory and combinatorics)
- Dr Roozbeh Hazrat (Acting Director, co-lead Diagram Algebras and semigroups)
- A/Prof Leanne Rylands
- Stuart Serdoz
- A/Prof Glenn Stone (Project Lead, Mathematical and statistical modelling)
- Dr Stephen Tawn
- Prof Wei Xing Zheng. (Project Lead, Control theory and signal processing)

Staff Profile – Volker Gebhardt



Dr Volker Gebhardt is a Senior Lecturer in CRM whose main area of interest is at the intersection of group theory, combinatorics, and algorithms. When he is not doing computational / combinatorial group theory, and sometimes even when he is, chances are that he is involved in one or more of the following: (a) sitting in front of a computer, provided the latter runs Linux; (b) trying to improve his time in 10km runs; (c) doing photography; (d) raising, looking after, or entertaining birds as a member of WIRES; (e) thinking about how to get Noisy Miners or Currawongs to give lectures or do marking.

Staff Profile – James East

James East is a lecturer in pure mathematics in CRM. His research interests include transformation semigroups, partition monoids/algebras and dual symmetric inverse monoids. His time is divided between semigroups and his one year old son. If that leaves him with any spare time, you will find him playing or watching cricket and playing piano and guitar. He also considers himself as something of a whisky connoisseur and sometimes under its influence, sometimes otherwise, dabbles in philosophy.

