

RUTH CORRAN – CURRICULUM VITAE

Born: December 5, 1971 in Sydney, Australia
Nationalities: Australian, British (dual)
Languages spoken: English (native speaker), French (fluent), German (rusty)
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CURRENT POSITION: THE AMERICAN UNIVERSITY OF PARIS

Associate Professor 2011 – present

Assistant Professor 2005 – 2011

- *On maternity leave Fall 2007*
- *On maternity leave Spring 2009*

TEACHING

- MA 1000 Making decisions for Spaceship Earth: Quantitative Reasoning and the Environment
 - *Course developed and taught for “FirstBridge” of Fall 2011*
- MA 1005 Mathematics for Life
- MA 1001 Algebra
- MA 1002 Precalculus
- MA 1010 Applied Finite Mathematics
- MA 1020 Applied Statistics I
- MA 1030 Calculus I
- MA 2030 Calculus II
- MA 2041 Linear Algebra
- MA 2400 Discrete Mathematics
- MA 3100 Applied Differential Equations

COURSE DEVELOPMENT

- MA 1002 Precalculus
 - *Course developed Fall 2009*
- MA 1000 Making decisions for Spaceship Earth: Quantitative Reasoning and the Environment
 - *Course developed and taught for “FirstBridge” of Fall 2011*
- MA 4*** Dynamic Modeling of the Environment
 - *Course developed in Spring 2011 and approved by CC for Masters in Public Policy and Climate Change program; however, the program did not run.*
- MA 3100 Applied Differential Equations
 - *Course developed Fall 2013*
- MA 0900 Intermediate Algebra
& MA 1025 Functions and Modeling (precalculus)
 - *Courses developed Fall 2015; to run Fall 2016*

CURRICULAR DEVELOPMENT

- Fall 2006: Mathematics General Education placement test
- Fall 2012: Quantitative Environmental Science major
- Fall 2015: Mathematics and Computer Science major proposal;

AUP SERVICE

- Fall 2006-Spring 2007: Department co-chair w/Claudia Roda
 - *Maternity leave Fall 2007*
- Fall 2008: Department co-chair w/Georgi Stojanov
 - *Maternity leave Spring 2009*
- Fall 2009 – Spring 2010 Search committee for Entrepreneurship position (M. Huhn hired)
- Fall 2010 – Spring 2012: General Education Committee, co-chair w/ Linda Martz
 - Spring 2012 Report on how AUP undergraduates fulfill their General Education requirements (particularly 3 yr vs 4 yr students)
- Fall 2012 – Fall 2014: Department co-chair w/Georgi Stojanov
- Fall 2012: Search Committee for *EC* Science position (Elena Berg hired)
- Fall 2012 – Spring 2014: General Education Committee, member
- Fall 2012 – Spring 2014: contributing to Enrolment projection models project w/ Shalani Alisharan and Kevin McCrossan
- Fall 2014 – Spring 2015: Chair, Search Committee for *Enseignant* mathematics position (Taylor Coffman hired)
- Fall 2015 – present: Rank and Promotion Committee
- Fall 2016 – Spring 2018: Elected department Chair

RESEARCH PROJECTS

1. *ROOT SYSTEMS OF COMPLEX REFLECTION GROUPS (2011-PRESENT)*

- With [Michel Broué \(Paris 7\)](#) and [Jean Michel](#) (CNRS)
- Generalization of notion of crystallographic root system of Weyl group to arbitrary reflection group over a complex vector space
- Applications in group representation theory; of particular interest in developing ideas of *spetses* (work of Broue, Malle, Michel)

Support received:

- July 2012: Two-week “work in pairs” retreat at CIRM (France’s MSRI)
- April 2014: Two-week visit to PKU Beijing University

Outcomes:

- Presentations
 - Broué, "[Cyclotomic Root systems](#)",
 - at the *Colloquium on Algorithms and Representations*, University of Aachen, Germany (July 2015) and
 - at the *Serge Bouc Conference*, EPFL, Lausanne (September 2015)
 - Michel, "[Systèmes de racines pour les groupes de réflexions complexes](#)" at the *Journées d’algèbre : Groupes algébriques, géométrie et représentations*, University of Caen, March 2016
- Manuscript near completion “*Root systems of Complex Reflection Groups*”

2. *WREATH PRODUCTS OF BRAID GROUPS (2014-PRESENT)*

- with [David Easdown](#) (University of Sydney)

- Group and monoid presentations, applications in group and semigroup theory

Support received:

- November 2015: David Easdown visited AUP (~1 week)

3. *GARSIDE STRUCTURES FOR BRAID GROUPS OF IMPRIMITIVE COMPLEX REFLECTION GROUPS (2001-2015)*

A. “Dual” structure for the braid group $B(e,e,r)$ (2001–2005)

- with David Bessis (CNRS Lyon and ENS Paris)
- Generalization of dual braid monoid via a generalization of the notion of non-crossing partitions
- At an intersection between algebra, geometry, combinatorics and computation

Support received:

- EU Marie Curie postdoctoral grant to come to Paris (2002–2004)

Outcomes:

- o *Garside structure for the braid group of $G(e,e,r)$* , with D. Bessis , arXiv:math.GR/0306186 (2003)
- o Developed code in Python to determine Garside-ness of a presentation
- o *Non-crossing partitions of type (e,e,r)* with D. Bessis, Adv. Math., 202 (2006), no. 1, 1 – 49
- o Seminar and conference presentation

B. “Semi-classical” structure for $B(e,e,r)$ (2006–2010)

- with Matthieu Picantin (LIAFA Paris 7 and CNRS)
- A hybrid structure between classical type A and dual dihedrals
- Combining algebra, combinatorics and computation

Outcomes:

- o *A new Garside structure for the braid groups of type (e,e,r)* , with Matthieu Picantin, J. Lond. Math. Soc., II. Ser. 84, No. 3, 689-711 (2011).
- o Numerous talks

C. Garside structures for $B(de,e,r)$ (2012-2014)

- with Eon-Kyung Lee (Sejong University, Seoul) and Sang-Jin Lee (Konkuk University, Seoul)
- infinite Garside structures utilizing semi-direct products with affine type A
- combining algebraic, combinatoric, computational and topological arguments

Support received:

- Lee and Lee visited the AUP in 2013

Outcome:

- o *Braid groups of imprimitive complex reflection groups*, with Eon-Kyung Lee and Sang-Jin Lee, J. Algebra 427, 387-425 (2015).
- o Conference/seminar talks

4. *AUTOMATICITY OF SINGULAR BRAID MONOIDS (2001-2013)*

- With Michael Hoffmann, Richard Thomas (CS, Leicester) and Dietrich Kuske (Ilmenau, Germany)
- Describing a computation of an automaton which determines equality and multiplication in singular braid monoids

- Connecting automata, algebra, geometry

Outcomes:

- Conference proceedings: Singular Artin monoids of finite Coxeter type are Automatic, with Michael Hoffmann, Dietrich Kuske, Richard M. Thomas at Language and Automata Theory and Applications - 5th International Conference, LATA 2011, Tarragona, Spain, May 26-31, 2011. Proceedings; 01/2011
- On the automaticity of singular Artin monoids of finite type, with Michael Hoffmann, Dietrich Kuske and Richard M, Thomas, Int. J. Comput. Math. 90, No. 6, 1197-1222 (2013).
- Conference/seminar talks

JOURNAL PUBLICATIONS

- Braid groups of imprimitive complex reflection groups, with Eon-Kyung Lee and Sang-Jin Lee, J. Algebra 427, 387-425 (2015).
- On the automaticity of singular Artin monoids of finite type, with Michael Hoffmann, Dietrich Kuske and Richard M, Thomas, Int. J. Comput. Math. 90, No. 6, 1197-1222 (2013).
- A new Garside structure for the braid groups of type (e,e,r) , with Matthieu Picantin, J. Lond. Math. Soc., II. Ser. 84, No. 3, 689-711 (2011).
- Conference proceedings: Singular Artin monoids of finite Coxeter type are Automatic, with Michael Hoffmann, Dietrich Kuske, Richard M. Thomas at Language and Automata Theory and Applications - 5th International Conference, LATA 2011, Tarragona, Spain, May 26-31, 2011. Proceedings; 01/2011
- Non-crossing partitions of type (e,e,r) with D. Bessis, Adv. Math., 202 (2006), no. 1, 1 - 49
- Conjugacy in singular Artin monoids, J. Aust. Math. Soc., 79 (2005) no. 2, 183 - 212
- Garside structure for the braid group of $G(e,e,r)$, with D. Bessis, arXiv:math.GR/0306186 (2003)
- On monoids related to braid groups, Bull. Austral. Math. Soc., 64(1) (2001) 173 - 176
- A normal form for a class of monoids containing the singular braid monoids, J. Algebra 223 (2000), no. 1, 256 - 282
- Solving the word problem in the singular braid monoids, Austral. Math. Soc. Gaz., 26(1) (1999), 27-33

CAREER OUTLINE

UNIVERSITY EDUCATION

- 1996 - 2000 PhD in Mathematics; thesis: "On monoids related to braid groups"
The University of Sydney
- 1995 University of Warwick, Coventry, England
- 1990 - 1994 Bachelor of Science with honours in Pure Mathematics
First Class and University Medal
The University of Sydney, Australia

EMPLOYMENT HISTORY

- 2011 - current Associate Professor (mathematics)
- 2005 - 2011 Assistant Professor (mathematics)
Department of Computer Science, Mathematics and Environmental Science
The American University of Paris (AUP), France

- 2004 – 2005 *Collaboratrice scientifique* (postdoctoral position, research & teaching)
Institut de Géométrie, Algèbre et Topologie
Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
- 2002 – 2004 Marie-Curie postdoctoral research fellow
Institute Henri Poincaré, Paris, France
- 2001 – 2002 Engineering and Physical Sciences Research Council (EPSRC) research assistant
Department of Mathematics and Computer Science
The University of Leicester, England
- 2000 – 2003 Associate Lecturer (tenured) (took leave without pay 2001 – 2003, then resigned)
School of Mathematics
The University of NSW (UNSW), Australia
- 1996 – 1999 Associate lecturer, half-time; Casual lecturer; Casual tutor
School of Mathematics and Statistics
University of Sydney, Australia
- 1998 Tutorial Assistant (Mathematics and Statistics appreciation)
For the *Diploma in Community Management*
Department of Indigenous studies
Macquarie University, Sydney, Australia

AWARDS AND FELLOWSHIPS

- 2001 Marie Curie Postdoctoral Grant (European Union; duration two years) – accepted.
- 2001 ARC Discovery Grant (4-year postdoctoral award from the Australian Research Council for independent research) – declined
- 2000 Postdoctoral Research Assistantship (EPSRC, UK; duration 15 months)
- 1998 B.H. Neumann prize (The Australian Mathematics Society)
- 1995 Australian Postgraduate Award (from 1996 to 1999)
- 1994 University of Sydney Travelling Scholarship
Overseas Research Student Award (Commonwealth Vice-Chancellors Committee, UK)
- 1993 The University Medal in Pure Mathematics (University of Sydney)
The Australian Federation of University Women prize in Mathematics
- 1992 The Cadbury Julius Sumner-Miller prize for Physics (University of Sydney)
- 1991 The Science Foundation prize for Physics (University of Sydney)