SALLY COCKBURN

Department of Mathematics
Hamilton College
Clinton, NY 13323
July 2022

EDUCATION

M.Sc., 2001, Systems Science, University of Ottawa.
Ph.D., 1991, Mathematics, Yale University.
M.Sc., 1984, Mathematics, Queen's University.
B.Sc. (Honors), 1982, Mathematics, Queen's University.

EMPLOYMENT

Professor of Mathematics, Hamilton College, July 2014 - present.
Associate Professor, Hamilton College, July 1997 to June 2014.
Part-Time Professor, University of Ottawa, Sept. 1997 to July, 1999.
Assistant Professor, Hamilton College, 1991-97.
Part-Time Acting Instructor, Yale University, 1989-91.
Secondary School Teacher, Maru a Pula School, Botswana, 1984-86.

PUBLICATIONS

"Symmetry Parameters for Various Hypercube Families," with Debra Boutin, Lauren Keough, Sarah Loeb, Puck Rombach. Accepted Manuscript in The Wilfrid Imrich Issue of *The Art of Discrete and Applied Mathematics*, online June 2022, `https://doi.org/10.26493/2590-9770.1481.29d`.

"Distinguishing Mycielskian Graphs," with Debra Boutin, Lauren Keough, Sarah Loeb, Kat Perry, Puck Rombach, in *Australasian Journal of Combinatorics*, June 2022, Vol. 83(2), pp. 225-242.

"Determining Numbers and Costs of Generalized Mycielskian Graphs," with Debra Boutin, Lauren Keough, Sarah Loeb, Kat Perry, Puck Rombach. *Discussiones Mathematicae Graph Theory*, vol.0, no.0, 2021, `https://doi.org/10.7151/dmgt.2438`.

"Symmetry Parameters for Mycielski Graphs," with Debra Boutin, Lauren Keough, Sarah Loeb, Kat Perry, Puck Rombach, in *Research Trends in Graph Theory and its Applications*, edited by Daniela Ferrero, Leslie Hogben, Sandra Kingan, Gretch Matthews, Association for Women in Mathematics Series, Vol. 25, Springer International Publishing, October 2021, (e-book ISBN 978-3-030-77983-2; hardcover ISBN 978-3-030-77982-5) pp. 99 - 117.

"Distinguishing Orthogonality Graphs," with Debra Boutin, *Journal of Graph Theory*, online June 2021, `http://doi.org/10.1002/jgt.22704`, pp. 1-16.

"Graphical Measures of Centrality and Power Grid Vulnerability," with Dr. Mary Goodloe, CCICADA Educational Modules (https://ccicada.org/education/ccicada-education-modules/#Graphical), March 2019.

"Homomorphic Preimages of Geometric Paths," *Discussiones Mathematicae Graph Theory*, online December 2017, ISSN 2083-5892, `https://doi.org/10.7151/dmgt.2025`; in print February 2018, Vol. 38 Issue 2, pp. 553 - 572.

"Preimages of small geometric cycles," *Journal of Combinatorial Mathematics and Combinatorial Computing*, May 2017, Vol. 101, pp. 233-244.

"The Senior Seminar in Philosophical Foundations of Mathematics," in *Using the Philosophy of Mathematics in Teaching Mathematics*, co-edited by Carl Behrens, Bonnie Gold and Roger Simons, MAA Notes (published electronically March 2017).

"The homomorphism poset of $K_{2,n}$," with Yonghyun Song '13, *Australasian Journal of Combinatorics*, October 2013, Vol. 57, pp. 79 - 108.

"Deranged Socks," with Joshua Lesperance, *Mathematics Magazine*, April 2013, Vol. 86, Issue 2, pp. 97 - 109.

"Modeling Preferential Admissions at Elite Liberal Arts Schools," with Timothy Kelly and Gordon Hewitt, *Research in Higher Education Journal*, Volume 19, March 2013; ISSN 1943-3432 (published online at `www.aabri.com/rhej`).

"Posets of Geometric Graphs," with Debra Boutin, Alice Dean and Andrei Margea, *Ars Mathematica Contemporanea* 5 (2012), pp. 265 - 284.

"Geometric Graph Homomorphisms," with Debra Boutin, *Journal of Graph Theory*, February 2012, Vol. 69, Issue 2, pp. 97 - 113.

"On the domino-parity inequalities for the *STSP*," with Sylvia Boyd and Danielle Vella, *Mathematical Programming Series A*, online January 2006, Pages 1 - 19, DOI 10.1007/s10107-006-0011-6, `http://dx.doi.org/10.1007/s10107-006-0011-6`; in print Vol. 110, Number 3, Sept. 2007, pp. 501 - 520.

"Some Problems are *NP*-Harder than Others," with Ben Coleman, Kay Somers, and R. Bruce Mattingly; Module 06-1, DIMACS Educational Module Series (published online at `http://dimacs.rutgers.edu/Publications/Modules/moduleslist.html`), June 2006.

"A family of facet-inducing domino-parity inequalities for the *STSP*," with Sylvia Boyd. Published as Technical Report TR-2001-09 (non-refereed) at the University of Ottawa, November 2001.

"A Counterexample to the Admissibility of the γ-Filtration on 2-Groups," *Journal of Algebra*, Vol. 167, No. 2, 1994, pp 501 - 532.

MANUSCRIPTS

"Edge Determining Sets and Determining Index," with Sean McAvoy '23, arXiv.org:2207.14122.

"Optimizing Student Adventure," with Chenchen Zhao '18. In preparation for future submission.

"The Homomorphism Poset of $K_{3,3}$," arXiv.org:1306.5732.

Senior Seminar Workbook in Set Theory, latest draft December 2020.

OTHER SCHOLARLY PRODUCTS

A180487, *The Online Encyclopedia of Integer Sequences*, `http://oeis.org`, Sept. 2010

AWARDS

2019 - appointed William R. Kenan, Jr. Professor of Mathematics and Statistics

2018 - Notable Year Achievement Award, one of the Dean's Scholarly Achievement Awards.

2014 - Mathematical Association of America Carl B. Allendoerfer Award for "Deranged Socks," co-authored with Joshua Lesperance.

PRESENTATIONS

July 2022: "Determining and Distinguishing Orthogonality Graphs," at Symmetries in Graphs, Maps and Polytopes (SIGMAP) in Fairbanks, AK.

July 2021: "Distinguishing Orthogonality Graphs," at the Society for Industrial and Applied Mathematics - Discrete Mathematics (SIAM -DM) (virtual). (Originally scheduled for June 2020.)

Jan. 2019: "Homomorphic Preimages of Geometric Paths," at the Joint Mathematical Meetings in Baltimore, MD.

July 2018: "Preimages of Geometric Paths," at the Summer Combo Conference at Saint Michael's College, VT.

Jan. 2016: "Preimages of Small Geometric Cycles," at the Combinatorics and Optimization Seminar at the University of Ottawa.

Jan. 2016: "Senior Seminar in Set Theory as a Springboard for Mathematical Philosophy," at the Joint Mathematical Meetings in Seattle, WA.

June 2015: "Preimages of Geometric Cycles," at the fifth Canadian Discrete and Algorithmic Mathematical Conference in Saskatoon, SK.

Apr. 2014: "Modeling Preferential Admissions at Liberal Arts Colleges," at the Hudson River Undergraduate Mathematics Conference (HRUMC) at Marist College, Poughkeepsie, NY.

Aug. 2013: "Modeling Preferential Admissions at Liberal Arts Colleges," at MathFest 2013 in Hartford, CT.

May 2011: "Permutations and Geometric Realizations of $K_{2,n}$," at the third Canadian Discrete and Algorithmic Mathematical Conference in Victoria, BC.

Oct. 2010: "Permutations and Geometric Realizations of $K_{2,n}$," to undergraduates at Skidmore College, NY.

Mar. 2010: "Permutations and Geometric Realizations of $K_{2,n}$," as a work in progress at the Discrete Mathematics Seminar at the University of Victoria, BC.

May 2009: "Geometric Graph Homomorphisms: Part I," joint work with Debra Boutin, at the second Canadian Discrete and Algorithmic Mathematical Conference in Montreal, QC.

May 2009: " 'Absurdities Too Gross to Confute'," a talk on infinity, at The Loomis Chaffee School.

Aug. 2007: "Thinking, Speaking, Writing: The Hamilton Senior Seminar," jointly with Richard Bedient, at MathFest 2007 in San Jose, CA.

Aug. 2006: "Deranged Socks" (joint work with Joshua Lesperance) at MathFest 2006 in Knoxville, TN.

Jan. 1993: "Hamilton's Senior Seminar," with Larry Knop and Richard Bedient, at the Joint Mathematical Meeting in San Antonio, TX.

OTHER PROFESSIONAL ACTIVITY

July 1, 2019 - June 30, 2020: Chair of the MAA Chauvenet Prize Committee

Sept. 2016 - present : Secretary/Treasurer of the Philosophy of Mathematics Special Interest Group of the Mathematical Association of America (POMSIGMAA).

Summer 2016 - Summer 2019: Appointed to the Mathematical Association of America Chauvenet Prize Committee.

Spring 2016: Refereed two manuscripts for *Mathematics Magazine*; reviewed one paper for *Mathematical Reviews*.

Summer 2015: Worked with Ning Xie '17 and Russell Marcus; readings on Gödel's incompleteness theorems.

Summers 2013-5: Reviewed papers for *Mathematical Reviews*.

Summer 2012: Refereed a manuscript for *Studies in Mathematical Science*.

Summer 2011: Worked with Yonghyun Song on research on permutation digraphs.

Summer 2011: Co-organizer (with Timothy Kelly and Quantitative Literacy Center Director Mary ONeill) of a faculty workshop, *Incorporating Quantitative Reasoning Across the Curriculum*, with invited speaker Corrine Taylor.

Summer 2008: Co-advisor (with Timothy Kelly) for summer student research to develop a mathematical model of preferential recruiting at the top 25 liberal arts colleges.

Summer 2008: Worked with Andrew Matlack '03 to design a linear algebra course for The Loomis Chaffee School.

Summer 2006: Co-advisor (with Marianne Janack) for summer student research by Alison Blank '07 in mathematical philosophy, under a Bristol Summer Research Fellowship.

Summer 2005: Received a Class of 1963 Faculty Fellowship ($2,000) to develop a senior seminar in Philosophical Foundations of Mathematics.

June 2004: Participant in DIMACS Reconnect program, "Experimental Algorithmics."

June 2003: Lecture for the Summer Startup Program: "Red Cliques, Green Cliques."

Summer 1996: Advisor for summer student researching locating-dominating sets, under a Howard Hughes grant.

Summer 1996: Received a Class of 1963 Faculty Fellowship to develop a course in Graph Theory & Combinatorics.

April 1996: Presentation on "How many people do you need for a good party?" (basic Ramsey Theory) at Clinton Central Schools annual mathematics banquet.

June 1995 and Spring 1996: Proofreader of mathematics textbooks for New Reader's Press of Syracuse, NY.

Oct. 1995: Co-hosted (with Kris Powers of the Department of Computer Science) the tenth annual Northeast Symposium on Graph Theory and Combinatorics at Hamilton College.

April 1994: Organized a workshop for local sixth grade girls for the Girls and Women in Science conference at Hamilton College.

Summer 1993: Participated in a PEW-funded project to design a pre-calculus level course in mathematical modeling of environmental data.

COLLEGE SERVICE

July 2018 - present - Faculty Member of the Harassment and Sexual Misconduct Board
July 2017 - June 2019: Member, Faculty Appeals Board
July 2017 - June 2018: Chair, Faculty Committee on Admission and Financial Aid
July 2016 - present: Chair, Department of Mathematics
July 2015 - June, 2017: Chair, Appeals Board
Jan. 2015 - present: Member of Faculty Committee on Admissions and Financial Aid
July 2014 - June 2015: Faculty Member of the Appeals Board
July 2013 - June 2014: Faculty Secretary
Oct. 2012 - April 2013: CAP liaison to the Experiential Learning Subcommittee
Sept. 2011 - May 2012: CAP liaison to the Writing Intensive Guidelines Revision Subcommittee
July 2011 - June 2013: Member of the Committee on Academic Policy
Aug. 2010 - Dec. 2015: Faculty Affiliate for the Men's and Women's Squash Teams
July 2009 - Dec. 2011: Mellon Curricular Leader for Quantitative and Symbolic Reasoning
July 2008 - July 2011: Faculty Member of the Honor Court
July 2008 - June 2009: Assistant Squash Coach
March 2008 - June 2008: Chair, Strategic Planning Subcommittee on Athletics
July 2004 - June 2008: Head Women's Squash Coach
July 2001 - July 2002: Chair of the Committee on Athletics
Oct. 2000 - June 2001: Member of the Committee on Athletics
Aug. 1999 - June 2004: Assistant Squash Coach
Aug. 1999 - July 2003: Member of the Committee on Academic Standing
Aug. 1999 - July 2000: Member of the Mellon Assessment Project Working Group
May 1996 - June 1997: Member of the Honor Court
Aug 1995 - June 1997: Member of the Sexual Harassment Grievance Board
Jan 1996 - April 1996: Member of the Sexual Harassment & Sexual Assault Policy Review Committee
Feb. - June 1994: Faculty Secretary

PROFESSIONAL AFFILIATIONS

Mathematical Association of America