

Sarah Brauner

CONTACT

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EDUCATION

- 2017— **University of Minnesota**
PhD Candidate in Mathematics
Advisor: Vic Reiner
- 2019 M.S. in Mathematics
Major topic: combinatorics and reflection groups
Minor topic: algebraic topology
- 2016-2017 **Smith College**
Post-Baccalaureate Program for Women in Mathematics, GPA: 4.0
- 2012-2016 **Reed College**
B.A. in Mathematics/Economics, GPA: 3.87

RESEARCH INTERESTS

Algebraic combinatorics and its intersection with representation theory, algebraic topology

PUBLICATIONS AND PREPRINTS

4. “Eulerian representations for real reflection groups,” [arXiv:2005.05953](https://arxiv.org/abs/2005.05953), 2020.
3. (With E. Banaian, H. Chandramouli, K. Klinger-Logan, A. Nadeau and M. Philbin.) “A Workshop to Build Community and Broaden Participation in Mathematics: Reflections on the Mathematics Project at Minnesota,” 2020. *Submitted*
2. (With F. Glebe and D. Perkinson) “[Enumerating Linear Systems on Graphs](https://arxiv.org/abs/1906.04768)”, *Mathematische Zeitschrift* (2020). [arXiv:1906.04768](https://arxiv.org/abs/1906.04768).
1. (With T. Friedmann) “On Specht Modules and the CataLAnKe Theorem,” [arXiv:1803.10918](https://arxiv.org/abs/1803.10918), 2018.

REFEREED CONFERENCE PRECEEDINGS

1. (With F. Glebe and D. Perkinson) “[Enumerating Linear Systems on Graphs](https://arxiv.org/abs/1906.04768)” *Séminaire Lotharingien de Combinatoire* **82B** (2019), Article # 17. Formal Power Series and Algebraic Combinatorics (FPSAC), Ljubljana, Slovenia.

AWARDS AND GRANTS

- 2020 MAA Tensor Grant for the Mathematics Project at Minnesota
 With E. Banaian, H. Chandramouli, M. Philbin, PI Paul Carter; \$6000.
- 2019 UMN Campus Climate Grant for the Mathematics Project at Minnesota
 With E. Banaian, H. Chandramouli, M. Philbin; \$500.
- 2019-2023 NSF Graduate Research Fellowship
 Three year graduate fellowship

2017-2023	UMN College of Science and Engineering Graduate Fellowship <i>Three year graduate fellowship</i>
2017	UMN School of Mathematics Naresh Jain Fellowship <i>Travel fellowship; \$1500.</i>
2016	Phi Beta Kappa
2016	Reed College Meier Award for Distinguished Thesis in Economics <i>Awarded to 1-2 graduating students annually</i>
2012-2016	Reed College Commendation for Academic Excellence (annually)
2014	Reed College McGill Lawrence Grant <i>To conduct research in South Africa; \$3000</i>

INVITED TALKS

2020	Random walks and hyperplane arrangements <i>Reed College Mathematics Colloquium</i> Reed College, Portland, OR
2019	Enumerating Linear Systems on Graphs <i>AMS Central Fall Sectional Meeting: Combinatorial Algebraic Geometry</i> University of Wisconsin, Madison WI <i>CAGE (Combinatorics, Algebra, and Geometry) Seminar</i> Drexel University, Philadelphia PA <i>AMS Northeast Spring Sectional Meeting: Chip Firing and Divisor Theory</i> University of Hartford, Hartford CT <i>Smith College Mathematics Colloquium Lunch Talk</i> Smith College, Northampton MA
2018	On Specht Modules and the CataLAnKe Theorem <i>AMS Central Fall Sectional Meeting: Combinatorics in Algebra and Geometry</i> University of Michigan, Ann Arbor MI

CONTRIBUTED TALKS

2019	Enumerating Linear Systems on Graphs (Poster) <i>Formal Power Series and Algebraic Combinatorics (FPSAC)</i> Ljubljana, Slovenia <i>ALGECOM XVI</i> Loyola University, Chicago, IL
2018	A generalization of the free Lie algebra and its representations <i>USTARS (Underrepresented Students in Topology and Algebra) Conference</i> Reed College, Portland OR

LOCAL TALKS

2020	Combinatorics at Minnesota (virtual) <i>Minnesota graduate students visiting weekend</i>
2020	Solomon's descent algebra and hyperplane arrangements <i>Student Combinatorics Seminar</i>
2019	An introduction to reflection groups <i>AMS Intro to Research Seminar</i>

2019	Topics in Hyperplane Arrangements (series) <i>Hyperplane Arrangement reading group</i>
2019	A guide to combinatorics at Minnesota <i>AWM Lunch talks</i>
2019	Eulerian representations for coincidental reflection groups <i>Student Representation Theory Seminar</i>
2019	Enumerating Linear Systems on Graphs <i>UMN Math Club</i>
2018	Garnir relations and Specht modules <i>Student Combinatorics Seminar</i>
2017	A generalization of the free Lie algebra <i>Student Combinatorics Seminar</i>

TEACHING

	University of Minnesota
2019-2020	TA, Calculus II for UMN Talented Youth in Mathematics Program (UMTYMP)
2019	TA, UMN REU in Combinatorics
	BEAM (Bridge to Enter Advanced Mathematics)
2018	Instructor of record and course designer for Logical Reasoning (6th graders)
	Smith College
2016-2017	TA in Tutoring Center, Calculus I, II, III and Linear Algebra
	Reed College
2014-2016	TA in Tutoring Center, Calculus I, II, III and Linear Algebra
2013-2016	Tutor for Introductory Analysis, Multivariate Calculus, Linear Algebra
2016	Grader, Math 382: Algorithms & Data Structures
2015-2016	TA and Grader, Microeconomic Theory
2013-2014	TA and Grader, Introduction to Economics

ORGANIZING

April 2021	Graduate Student Combinatorics Conference (GSCC) 2021 National weekend conference organized by and for graduate students. <i>Co-organizer</i> with E. Banaian, G. Dorpalen-Barry, E. Kelley, E. Stucky, L. Webster
	Mathematics Project at Minnesota (MPM) An annual 4-day workshop for undergraduates from underrepresented groups to increase participation and success in mathematics.
2020—	<i>Co-organizer</i> with H. Chandramouli, E. Banaian, M. Philbin
2019	<i>Mentor</i> : Planned and implemented several workshop sessions
2018-2020	UMN Math Club Weekly club for undergraduate math majors to build community and foster mathematical curiosity <i>Co-organizer</i> with M. Avery
Fall 2019	Hyperplane arrangement seminar and reading group
2018-2019	UMN Graduate Student Combinatorics and Algebra Seminar <i>Co-organizer</i> with E. Banaian

MENTORING

2019—	Research mentor for undergraduates N. Pham and A. Christiansen <i>Directing research project on chip-firing</i>
Fall 2018	Directed Reading Project (DRP) course on graph theory with S. Perron
2018—	Mentor for undergraduate math majors through MPM <i>Assist with application materials for fellowships, REUs and graduate school</i>
2018-2019	Mentor and host for incoming graduate students
2017-2019	UMN Women in Science and Engineering Graduate Mentor <i>Mentor for UMN undergraduates interested in STEM</i>
2013	Reed College International Student Mentor

OUTREACH

	Teacher at Saturday Enrichment for MathCEP, University of Minnesota
2019	<i>Logic Games and Puzzles</i> (grades 5-6)
2018	<i>Fractals and Chaos</i> (grades 5-6)
2018	<i>Graph Theory</i> (grades 7-8)
2017	<i>Cryptology</i> (grades 5-6)
2017-2019	Volunteer math tutor for adults seeking GED, <i>Franklin Public Library</i>
2016	MathFest Teaching Assistant: Platonic Solids (grades 6-8), <i>Reed College</i>
2012-2016	Volunteer tutor for low-income youth (grades 9-12), <i>Friends of the Children</i>

BIOGRAPHY

BORN:	January 9, 1993 in New York, NY
CITIZENSHIP:	United States