

# Curriculum Vitae

Zajj Daugherty

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Reed College	

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## RESEARCH SPECIALIZATION

General: Algebra and Combinatorics (MSC 16, 05E, 17B)  
Specific: Combinatorial representation theory, centralizer and diagram algebras, Hecke algebras, Lie algebras and quantum groups, symmetric functions.

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## EDUCATION

Ph.D. Mathematics, University of Wisconsin–Madison, August 2010  
Dissertation title: *Degenerate two-boundary centralizer algebras*  
Advisor: Arun Ram  
Minor: Mathematics education

M.A. Mathematics, University of Wisconsin–Madison, December 2006

B.S. Mathematics (with distinction), Harvey Mudd College, May 2005

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## EMPLOYMENT

Reed College, Associate Professor (TT, Fall 2022–present)

The City College of New York  
Associate Professor (Tenured, Fall 2022–Spring 2023, on leave)  
Assistant Professor (TT, Spring 2015–Spring 2022)

CUNY Graduate Center, Doctoral Faculty in Mathematics (Fall 2018–Spring 2023)

University of Melbourne, Research Fellow in Representation Theory (Fall 2014), Faculty of Science Fellow (Summer 2009)

Dartmouth College, John Wesley Young Research Instructor (Summer 2011–Summer 2014)  
Mentor: Rosa Orellana

Institute for Computational and Experimental Research in Mathematics, Postdoctoral Fellow (Spring 2013)

St. Olaf College, Assistant Professor of Mathematics (Visiting, Fall 2010–Spring 2011)

University of Wisconsin, Madison, Graduate student (Fall 2005–Spring 2010), Teaching Assistant, NSF Research Assistant (Summer 2008), and VIGRE Fellow (Spring 2006, Summer 2006, Spring 2009)

Mathematical Sciences Research Institute, Program Associate and Research Assistant (Spring 2008)

## HONORS, AWARDS, AND GRANTS

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- ❖ *Dean's Summer Scholarship award*, Summer 2024.
- ❖ *CCNY Division of Science Award for Excellence in Teaching, Curricular Innovation and Assessment*, 2021.
- ❖ *Simons Foundation Collaboration Grants for Mathematicians* (PI), #586728 “Combinatorics and representation theory of centralizer algebras” \$42,000 (2018–2023)
- ❖ *National Science Foundation Recruitment and Mentoring in Mathematics Program Grant* (Senior Personnel) #1820731 \$477,136 (2018–2021)
- ❖ Membership to two sessions of *MSRI Summer Research for Women in Mathematics*, \$6,996 (2018)
- ❖ *PSC-CUNY Research Award* (PI), #61204-00 49, \$3,500 (2018–2019)
- ❖ *PSC-CUNY Research Award* (PI), #69636-00 47, \$6,000 (2016–2017)
- ❖ *National Science Foundation Individual Grant* (PI) DMS-1162010 “Combinatorics and representation theory of centralizer algebras” \$82,543 (2012–2017)
- ❖ *Australian Research Council Discovery Grant* (co-PI) DP130100674 “Tantalizer algebras and generalized lattice models,” with A. Ram, \$350,000 (2013–2016)
- ❖ *AMS-Simons Travel Grant* (PI) (2012–2014)
- ❖ *UW-Madison university-wide Capstone Ph.D. Teaching Award* (2010)  
(Granted to Ph.D. students who have performed as outstanding teaching assistants throughout their UW-Madison tenure.)
- ❖ *Elizabeth S. Hirschfelder Scholarship* (2010)  
(Granted to female mathematics graduate students at UW making excellent progress towards the Ph.D.)
- ❖ *VIGRE Merit Based Fellowships* (Spring 2006, Summer 2006, Spring 2009)
- ❖ *Mathematics Graduate Teaching Award* (2009)
- ❖ *Celebrating Women in Science & Engineering Grant* (2008 P.I., 2009)  
(Grant to support invited female mathematics colloquium speakers and related activities.)
- ❖ *Mary Ellen Rudin Fellowship* (2005)

## RESEARCH ACTIVITIES

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### Publications

- [1] *Getting to know infinity*, excerpt in “How to win friends and influence fungi: collected quirks of science, tech, engineering, and math from Nerd Nite”, Ed. C. Balakrishnan and M. Wasowski, St. Martin's Press (2024), pp. 257–260.
- [2] *Set-valued tableaux for Macdonald polynomials*, (with A. Ram), *Sëm. Lothar. Combin.* **89B** (2023), Art. 42, 12 pp.
- [3] *On calibrated representations of the degenerate affine periplectic Brauer algebra*, (with I. Halacheva, M.S. Im, and E. Norton), *Surv. Math. its Appl.* **16** (2021). arXiv:1905.05148
- [4] *On quasisymmetric power sums* (with C. Ballantine, A. Hicks, S. Mason, E. Niese), *J. Combin. Theory Ser. A* **175** (2020); Extended abstract appearing in FPSAC 2018 Conference Proceedings, *Sem. Lothar. Combin.* **80B** (2018) #25, 12 pp. arXiv:1710.11613

- [5] *The affine VW supercategory*, (with M. Balagovic, I. Entova Aizenbud, I. Halacheva, J. Hennig, M.S. Im, G. Letzter, E. Norton, V. Serganova, and C. Stroppel), *Selecta Math.* (N.S.) **26** (2020), no. 2, #20, 42 pp. arXiv:1801.04178
- [6] *Translation functors and decomposition numbers for the periplectic Lie superalgebra  $\mathfrak{p}(n)$* , (with M. Balagovic, I. Entova Aizenbud, I. Halacheva, J. Hennig, M.S. Im, G. Letzter, E. Norton, V. Serganova, and C. Stroppel), *Math. Res. Lett.* Vol.26 (2019), no.3. arXiv:1610.08470
- [7] *Centralizers of the infinite symmetric group* (with P. Herbrich), 26th International Conference on Formal Power Series and Algebraic Combinatorics, pp. 453–464. arXiv:1309.3510
- [8] *The quasi-partition algebra* (with R. Orellana), *J. Algebra* **404** (2014), 124–151. arXiv:1212.2596
- [9] *Affine and degenerate affine BMW algebras: Actions on tensor space* (with A. Ram and R. Virk), *Selecta Math.* **19** (2013) no. 2, 611–653. arXiv:1205.1852
- [10] *Affine and degenerate affine BMW algebras: The center* (with A. Ram and R. Virk), *Osaka J. Math.* **51** (2014), no. 1, 257–285. arXiv:1105.4207
- [11] *Degenerate two-boundary centralizer algebras*, *Pacific J. Math.* **258** (2012), no. 1, 91–142. arXiv:1007.3950
- [12] *Degenerate two-boundary centralizer algebras*, Doctoral dissertation, University of Wisconsin–Madison, June 2010.
- [13] *Voting, the symmetric group, and representation theory* (with A. Eustis, G. Minton, and M. Orrison), *Amer. Math. Monthly* **116** (October 2009), no. 8.
- [14] *Integrality of Quotients of Wronskians of the Andrews-Gordon Series*, *Integers* **6** (2006).
- [15] *An Algebraic Approach to Voting Theory*, Senior thesis, Harvey Mudd College (2005)

### Preprints:

- [i] *Calibrated representations of the two-boundary Temperley-Lieb algebras*, (with A. Ram) arXiv:2009.02812 (provisionally accepted)
- [ii] *Two boundary Hecke algebras and combinatorics of type C*, (with A. Ram) arXiv:1804.10296 (in review)

### Invited presentations (last ten years)

- 5/2024 Algebra and Number Theory Seminar, Oregon State University.
- 3/2024 Combinatorics Seminar, UC Berkeley.
- 2/2024 Nerd Nite Pannel, Emerald City Comic Con.
- 7/2023 35th International Conference on Formal Power Series and Algebraic Combinatorics, Davis, CA.
- 5/2023 Combinatorics and Geometry Seminar, University of Washington.
- 12/2022 Colloquium, Lewis and Clark.
- 9/2022 Colloquium, Reed college.
- 6/2022 RAMMP colloquium, The City College of New York.
- 4/2021 Combinatorics seminar, UC Berkeley.
- 12/2020 Colloquium, College of the Holy Cross.
- 10/2020 Special Session on Monoidal Categories in Representation Theory, AMS Fall Western Sectional Meeting, University of Utah.
- 7/2020 RAMMP colloquium, The City College of New York.

- 2/2020 Colloquium, University of Victoria.
- 1/2020 Colloquium, UC Santa Barbara.
- 10/2019 Combinatorics seminar, University of Southern California.
- 10/2019 Algebra, Number Theory, and Combinatorics seminar, Pomona College.
- 9/2019 Conference on Integrability, Combinatorics, and Representations, Hyères France.
- 11/2018 The Math and Democracy Seminar, NYU Center for Data Science.
- 9/2018 *Alice Dickinson Lecture in Mathematics* (plenary address) at Women in Mathematics in New England Conference, Smith College.
- 7/2018 30th International Conference on Formal Power Series and Algebraic Combinatorics, Dartmouth College.
- 4/2018 Special Session on Combinatorial Representation Theory, Spring Eastern Sectional Meeting, Northeastern University.
- 3/2018 New York Combinatorics Seminar, CUNY Graduate Center.
- 11/2017 3rd meeting of the US-Mexico Conference on Representation Theory, Categorification, and Noncommutative Algebra, Mexico City.
- 10/2017 Discrete Math Day at Queens College, Queens NY.
- 10/2017 Colloquium, Bronx Community College, Bronx NY.
- 4/2017 Mathematical-Physics Seminar, Centre de recherches mathématiques, Montréal.
- 3/2017 Colloquium, New York City College of Technology, Brooklyn, NY.
- 7/2016 Conference on Representation Theory and Physics, University of Leeds, Leeds UK.
- 5/2016 Keynote address at Graduate Student Conference in Algebra, Geometry, and Topology, Temple University, Philadelphia, PA.
- 4/2016 6th Annual York College Women In Mathematics Day, York College, New York, NY.
- 11/2015 Special Session on Representation Theory, Vertex Operator Algebras, and Related Topics, Fall Eastern Sectional Meeting, Rutgers University.
- 7/2015 Workshop on Categorification, University of Melbourne, Australia.
- 3/2015 Representation Theory Seminar, CUNY Graduate Center, New York.
- 12/2014 8th Australia New Zealand Mathematics Convention, Melbourne, AU.
- 11/2014 Conference on Topology and Representation Theory at Kioloa, AU.
- 9/2014 Algebra, Geometry, and Topology Seminar, The University of Melbourne.
- 9/2014 Workshop on Diagram Algebras, University of Stuttgart, Germany.
- 9/2014 Special program on Algebraic Lie theory and representation theory, ICMS, Edinburgh.
- 7/2014 26th International Conference on Formal Power Series and Algebraic Combinatorics, Chicago IL.

## SERVICE ACTIVITIES

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### Reed College

- ❖ Organizer for Summer Research Seminar (Summer 2024)
- ❖ Mathematics search committee member (2024)
- ❖ Math preparedness ad hoc committee (2024)
- ❖ Faculty advisor for SL(m), “Social/Liaison Mathematics Group” (Fall 2022–present)
- ❖ Secretary for Division of Mathematical and Natural Sciences (23/24)
- ❖ Placement and transfer credit for mathematics (Fall 2023–present)
- ❖ Summer Scholarships in Math & Stats selection committee (22/23)

#### *College-wide committees:*

2024/25: Admissions and Financial Aid  
Orientation

2023/24: Admissions and Financial Aid  
Ad hoc advisory committee to select Associate Dean of Faculty

2022/23: Off-Campus Study Programs

#### *Research students mentored:*

2023/24: *Thesis:* Mollie Boor, Valerie Wu\*

*Summer research:* Charlie Delano, June Duvivier, Patrick Norton\*, Pranay Pingali\*,  
Elijah Whitlam-Sandler\*, Guangyi Zhang\*

2022/23: *Thesis:* Kellen Brosnahan, Zack Dooley, Heyuan (Larry) Zeng†

### The City College of New York

- ❖ Departmental Social Amenities Treasurer (2019–2022)
- ❖ Faculty advisor for CCNY AWM chapter (2018–2022)
- ❖ Faculty advisor for CCNY Math Club (2020)
- ❖ Organizer of Mathematics Colloquium at CCNY (2016–2018)

#### *Committees:*

2015–22: Department of Mathematics Pure Mathematics Committee

2014/15: Bernard Levine Scholarship Committee

#### *Research Students Mentored:*

2018/19: Adrian Falcone, Casey Smith‡, Pavel Javornick

2016/17: Casey Bolles, Isroel Kogan§

2014/15: Anastasia Khomenko, Dhaniram Kesari

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\*Joint with Noah Charles.

†Joint with Joshua Grancher.

‡Joint with Arun Ram.

§Joint with Gautam Chinta.

## Broader community (post Ph.D.)

- ❖ Co-organizer, Research Community in Algebraic Combinatorics at the Institute for Advanced Studies, 2025.
- ❖ Co-organizer, Underrepresented Students in Algebra and Topology (USTARS), 2025
- ❖ Selection committee for Summer Research in Mathematics at the Simons Laufer Mathematical Sciences Institute (2023–present; Chair 2024–present)
- ❖ Panelist, “Navigating the Path to Career Success” at Community in Algebraic and Enumerative Combinatorics, Banff International Research Station (January 2024)
- ❖ Co-organizer, “Cascade Lectures in Combinatorics” (2023)
- ❖ Coauthor and administrator for the website for Women in Algebraic Combinatorics and mailing list, <http://www.womeninac.org/> (2017–present)
- ❖ Mentor for Math Alliance (2019–2022)
- ❖ Mathematical committee, Women and Math Program, Institute for Advanced Study (2021)
- ❖ Co-organizer, Women in Combinatorics and Representation Theory, Diversity and Excellence Workshop (2021)
- ❖ Research leader for WINART2: Women in Noncommutative Algebra and Representation Theory workshop (2019).
- ❖ Program Committee, international conference on Formal Power Series and Algebraic Combinatorics (FPSAC) (2017)
- ❖ Presenter at College & Career Week, Girls Prep Bronx (2016, 2017)
- ❖ Mentor for Women in Science Mentoring Program at CUNY (2016)
- ❖ Mentor for Summer Scholars research group in representation theory at the University of Melbourne (2014)
- ❖ Co-organizer, Special Session on Algebraic Combinatorics and Representation Theory at the JMM 2015 (2015)
- ❖ Co-organizer, Dartmouth Combinatorics Seminar (2011–2014)
- ❖ Co-organizer, Discrete Math Day (2014)
- ❖ Co-organizer, Sonia Kovalevsky Mathematics Days (2011–2014)