

# Sarah E. Blackwell

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Department of Mathematics

University of Virginia

Charlottesville, VA 22903

## Research Interests

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Broadly: low-dimensional topology, symplectic and contact geometry, knot theory.

Specifically: trisections of 4-manifolds, knotted surfaces, Lagrangian cobordisms between Legendrians.

## Employment

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NSF Postdoctoral Fellow and Instructor, University of Virginia, Charlottesville, VA Aug 2023-Jul 2026

- Mentor: Slava Krushkal

Postdoctoral Fellow, Max Planck Institute for Mathematics, Bonn, Germany Sep 2022-Jul 2023

- Mentor: Arunima Ray

## Education

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Ph.D. in Mathematics, University of Georgia, Athens, GA Aug 2016-Aug 2022

- Advisor: David Gay
- Max Planck Institute for Mathematics (guest program)
- Graduate Certificate in Mathematics Education

Oct 2019-May 2020

M.A. in Mathematics, University of Georgia, Athens, GA May 2018

B.A. in Mathematics, Saint Louis University, St. Louis, MO May 2016

- Minor in Philosophy
- National University of Ireland Galway (study abroad) Aug-Dec 2014

## Grants & Awards

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### Grants, Fellowships, Scholarships

Mathematical Sciences Postdoctoral Research Fellowship (MSPRF), 2023-2026

National Science Foundation

DEI Small Grant (co-PI Ryan Stees), \$10,000, University of Virginia 2025-2026

DEI Small Grant (co-PI Ryan Stees), \$5,000, University of Virginia 2024-2025

Presidential Graduate Fellow, University of Georgia 2016-2021

B.J. Ball Scholarship (departmental), University of Georgia 2019, 2020

Costigan Scholarship (departmental), Saint Louis University 2014, 2015

### Awards & Honors

David Galewski Outstanding Graduate Teaching Award (departmental), 2022  
University of Georgia

Outstanding Teaching Assistant Award, University of Georgia 2021

*Updated: December 2025*

|   |      |
|---|------|
| Oden-Beder Prize (for the Elevating Mathematics video competition),<br>National Academy of Sciences                               | 2020 |
| Collins Award (given to one graduating student in each department of the<br>College of Arts and Sciences), Saint Louis University | 2016 |
| Garneau Award (departmental), Saint Louis University  | 2016 |
| Phi Beta Kappa, Saint Louis University  | 2015 |

## Publications & Preprints (\* denotes undergraduate coauthor)

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- [10] "The combinatorics of triple knot diagrams" (with Aaron Mathis). In preparation.
- [9] "[Cornered skein lasagna theory](#)" (with Slava Krushkal and Yangxiao Luo). Submitted.
- [8] "[Classical invariants of spiral knots](#)" (with Ashish Das\*, Sydney Mayer\*, Luke Moyar\*, Faisal Leo Quraishi\*, Ryan Stees). Submitted.
- [7] "[Pants distances of knotted surfaces in 4-manifolds](#)" (with Román Aranda, Devashi Gulati, Homayun Karimi, Geunyoung Kim, Nicholas Paul Meyer, Puttipong Pongtanapaisan). Submitted.
- [6] "[Bridge indices of spatial graphs and diagram colorings](#)" (with Puttipong Pongtanapaisan and Hanh Vo). In: *Discrete Mathematics* 349.3 (2026), pp. 114813.
- [5] "[A group-theoretic framework for low-dimensional topology](#)" (with Robion Kirby, Michael Klug, Vincent Longo, Benjamin Ruppik). In: *Algebraic & Geometric Topology* 25.8 (2025), pp. 4667-4718.
- [4] "[Constructing Lagrangians from triple grid diagrams](#)" (with David Gay and Peter Lambert-Cole). In: *Journal of Symplectic Geometry* 23.3 (2025), pp. 673-711.
- [3] "[Constructions of Lagrangian Cobordisms](#)" (with Noémie Legout, Caitlin Levenson, Maylis Limouzineau, Ziva Myer, Yu Pan, Samantha Pezzimenti, Lara Simone Suárez, Lisa Traynor). In: *Research Directions in Symplectic and Contact Geometry and Topology*. Vol. 27. Association for Women in Mathematics Series. Springer, Cham, 2021, pp. 245-272.
- [2] "[Good Reduction of Preperiodic Points.](#)" In: *Minnesota Journal of Undergraduate Mathematics* 4.1 (2018).
- [1] "[A Generalization of a Method of Mordell to Ternary Quadratic Forms](#)" (with Gabriel Durham, Katherine Thompson, Tiffany Treece). In: *International Journal of Number Theory* 12.8 (2016), pp. 2081-2105.

## Expository Works

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- [5] "[Trisections of four-dimensional spaces.](#)" Expository article, *Snapshots of Modern Mathematics from Oberwolfach* (2025).
- [4] "[The Mathematics of Gerrymandering](#)" (with Zack Garza, Terrin Warren, Peter Woolfitt, Skylar Zhang). YouTube video, 2<sup>nd</sup> place in UGA Capturing Science Contest (2020).
- [3] "[Knots Model DNA.](#)" YouTube video, winner of the National Academy of Sciences Elevating Mathematics video competition (2020).
- [2] "[Torus Tic-Tac-Toe.](#)" Ignite talk (and materials), Park City Mathematics Institute (2019).

- [1] "[Community, Professional Advice, and Exposure to New Ideas at the Carleton Summer Mathematics Program](#)" (with Rose Kaplan-Kelly and Lilly Webster). Blog post, *AMS Blog On Teaching and Learning* (2015).

## Research Talks (⚡ denotes lightning talk)

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### Conference Talks

|  |          |
|--|----------|
| AMS Southeastern Sectional Meeting, Savannah, GA   | Mar 2026 |
| <i>Special Session on Recent Advances in Contact and Symplectic Topology</i>                                 |          |
| Joint Mathematics Meeting, Washington D.C.   | Jan 2026 |
| <i>AMS Special Session on Surfaces in 3- and 4-manifolds: Theory and Computation</i>                         |          |
| Trisections and Related Topics (at CIRM), Marseille, France  | Oct 2025 |
| Trisectors Workshop (⚡), Austin, TX  | Jun 2025 |
| AWM Research Symposium, Madison, WI  | May 2025 |
| <i>Women and Gender Minorities in Symplectic and Contact Geometry and Topology (WISCons) in Madison</i>      |          |
| Joint Mathematics Meeting, Seattle, WA   | Jan 2025 |
| <i>AMS Special Session on Heegaard Splittings of 3-manifolds and Trisections of 4-manifolds</i>              |          |
| Trisectors Workshop, Lincoln, NE   | Jun 2024 |
| Trisectors Workshop, Davis, CA   | Jun 2023 |
| <i>Pre-workshop mini-course</i>  |          |
| Low-Dimensional Workshop (at the Erdős Center) (⚡), Budapest, Hungary  | Mar 2023 |
| Morphisms in Low Dimensions (at MFO) (⚡), Oberwolfach, Germany   | Jan 2023 |
| Low-Dimensional Topology (at MFO), Oberwolfach, Germany  | Jan 2023 |
| Topology in Dimension 4.5 (at BIRS), Banff, Canada   | Nov 2022 |
| 4-Manifolds: From Above and Below (at CIRM) (⚡), Marseille, France   | Sep 2022 |
| Trisectors Workshop, Bellingham, WA  | Jun 2022 |
| New Developments in Four Dimensions (⚡), Victoria, Canada  | Jun 2022 |
| Joint Mathematics Meeting, online  | Apr 2022 |
| <i>AWM Special Session on Women and Gender Minorities in Symplectic and Contact Geometry and Topology</i>    |          |
| <i>AMS Special Session on Knots, Links, 3-manifolds,... and 4-manifolds</i>                                  |          |
| Graduate Student Topology and Geometry Conference, Atlanta, GA   | Apr 2022 |
| Spring Topology and Dynamical Systems Conference, Waco, TX   | Mar 2022 |
| <i>Special Session in Geometric Topology</i>   |          |
| AMS Southeastern Sectional Meeting, online   | Nov 2021 |
| <i>Special Session on Low Dimensional Symplectic and Contact Topology, Their Invariants and Interactions</i> |          |
| AMS Central Sectional Meeting, online  | Oct 2021 |
| <i>Special Session on Geometric Topology</i>   |          |
| Tech Topology Summer School (⚡), online  | Jul 2021 |
| Young Topologists Meeting, online  | Jul 2021 |
| Graduate Student Conference in Algebra, Geometry, and Topology, online                                       | May 2021 |
| Graduate Student Topology and Geometry Conference, online  | Apr 2021 |
| Tech Topology Conference (⚡), online   | Dec 2020 |

### External Seminar Talks and Colloquia

|   |          |
|---|----------|
| Virginia Commonwealth University Geometry Seminar | Oct 2025 |
| Texas A&M University Topology Seminar             | Oct 2025 |

|  |          |
|--|----------|
| Christopher Newport University Mathematics Colloquium                                      | Sep 2025 |
| Chiang Mai University Math Science Colloquium  | Jul 2025 |
| Chulalongkorn University Math Seminar  | Jul 2025 |
| University of Nebraska-Lincoln Learning Seminar on Legendrian Knots                        | Mar 2025 |
| Philadelphia Area interested in Contact Topology (PACT) Seminar (two talks)                | Oct 2024 |
| George Mason University Geometry MMA + TADS Joint Seminar                                  | Oct 2024 |
| Saint Louis University AWM Speaker Series  | Sep 2024 |
| Caltech Geometry & Topology Seminar  | Apr 2024 |
| Arizona State University Geometry and Topology Seminar                                     | Apr 2024 |
| University of California, Santa Barbara Topology Seminar                                   | Mar 2024 |
| Saint Louis University Mathematics Colloquium  | Jan 2024 |
| Illustrating Mathematics Seminar: Show & Ask (✓)   | Jan 2024 |
| University of Georgia Topology Seminar   | Oct 2023 |
| University of Hamburg Research Seminar on Quantum Topology<br>and Categorification (QTCat) | Jul 2023 |
| University of Georgia Topology Seminar   | Nov 2022 |
| University of Virginia Geometry Seminar  | May 2022 |
| Virtual Trisectors Meeting   | May 2022 |
| Western Hemisphere Virtual Symplectic Seminar  | Feb 2022 |
| Binghamton University Geometry and Topology Seminar  | Feb 2022 |
| Rice University Topology Seminar   | Dec 2021 |
| Geometric Topology Grad and Postdoc Seminar  | Nov 2021 |
| AIM 4-Dimensional Topology Research Community (✓)  | Mar 2021 |
| Virtual Trisectors Meeting (with Vincent Longo and Benjamin Ruppik) (two talks)            | Feb 2021 |
| Geometric Topology Grad and Postdoc Seminar  | Mar 2020 |
| Geometric Topology Grad and Postdoc Seminar  | Dec 2019 |
| Geometric Topology Grad and Postdoc Seminar  | Jul 2019 |

### **Internal Seminar Talks**

|   |                              |
|---|------------------------------|
| UVA Geometry Seminar                                  | Sep 2023, Sep 2025           |
| UVA Research Story Seminar                            | Mar 2024                     |
| UVA 4-Manifolds Reading Group (three talks)           | Oct 2023                     |
| UVA Graduate Student Seminar (✓)                      | Oct 2023                     |
| MPIM Open Problems Seminar                            | Mar 2023                     |
| MPIM Low-Dimensional Topology Seminar                 | Oct 2022                     |
| MPIM Topology Seminar (✓)                             | Oct 2022                     |
| UGA Math Graduate Visitation Day                      | Mar 2021, Mar 2022           |
| UGA Graduate Student Seminar                          | Oct 2020, Feb 2022           |
| UGA Topology Seminar                                  | Feb 2021                     |
| UGA Graduate Student Summer Conference                | Jul 2018, Jul 2020, Aug 2021 |
| UGA Topology Student Seminar                          | 2017-2020 (x5)               |
| MPIM Oberseminar                                      | Jan 2020                     |
| MPIM Configuration Spaces Seminar (with Jason Joseph) | Oct 2019                     |

## Teaching Experience

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### Courses Taught

|   |                |
|---|----------------|
| Elementary Linear Algebra (MATH 3351), University of Virginia   | Fall 2025      |
| Introduction to Geometry (MATH 5700), University of Virginia    | Spring 2025    |
| Introduction to Knot Theory (MATH 4750), University of Virginia | Fall 2024      |
| Calculus (MATH 2250), University of Georgia                     | 2021-2022 (x2) |
| Precalculus (MATH 1113), University of Georgia                  | 2018-2021 (x6) |

### Other Teaching Experiences

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|--|-------------------|
| Grader, Algebraic Topology (MATH 8200), University of Georgia                                  | Spring 2022       |
| Assistant Mentor, Camp Euclid, Euclid Lab  | Summer 2020, 2021 |
| Teaching Assistant, Algebraic Topology (MATH 8200), University of Georgia                      | Spring 2021       |
| Graduate Student Leader, Topology Qualifying Exam Preparation Course,<br>University of Georgia | Summer 2020       |
| Teaching Assistant, Undergraduate Summer School, Park City Mathematics Institute               | Summer 2019       |
| Tutor, Study Hall, University of Georgia   | Spring 2019       |
| Tutor, Mathnasium, St. Louis, MO   | Jan 2013-Jul 2016 |

### Teacher Training

|   |                |
|---|----------------|
| Project NExT Orange '25 Fellow, Mathematical Association of America                                   | 2025-2026      |
| STEM (Teaching) Symposium, University of Virginia   | Fall 2024      |
| MATH Summer Teaching Workshop Keynote, University of Virginia   | Fall 2024      |
| MALT (Mathematics Learning and Teaching) Seminar, University of Georgia                               | 2016-2022      |
| Certificate in Diversity and Inclusion, University of Georgia   | earned 2022    |
| Teaching Preparation Courses (GRSC 7770, MATH 9005 x3), University of Georgia                         | 2016-2021 (x4) |
| "Advocating for Student of Color: There's More You Can Do" Webinars,<br>American Mathematical Society | Fall 2020 (x3) |
| "Teaching During COVID" Panel, UGA Mathematics Education Student Association                          | Fall 2020      |
| "Teaching Online in Summer & Fall 2020" Mini-Course, Aspire Alliance                                  | Spring 2020    |
| Spring Teaching Symposium, UGA Center for Teaching and Learning                                       | Spring 2019    |
| Universal Design for Learning Training, UGA Center for Teaching and Learning                          | Fall 2018      |
| Diversity Training, UGA Center for Teaching and Learning  | Spring 2018    |
| Safe Space Training, UGA Pride Center   | Fall 2017      |

## Mentoring, Outreach, Service

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### Undergraduate & Graduate Mentoring

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|---|-----------------------------------|
| University of Memphis PhD Student, Mentor<br><i>Ongoing mentorship; resulting preprint [10] currently in preparation.</i>     | Fall 2023-present                 |
| UVA Topology REU, Project Leader (with Ryan Stees)<br><i>Resulted in a preprint [8] and student presentation at JMM 2025.</i> | Summer 2024                       |
| UVA Directed Reading Program, Mentor  | Fall 2023, Spring 2024, Fall 2024 |
| UVA Geometry Lab, Mentor  | Fall 2023, Spring 2024            |

|                                       |             |
|---------------------------------------|-------------|
| MPIM Visiting Masters Student, Mentor | Summer 2023 |
| UGA Directed Reading Program, Mentor  | Summer 2021 |

### Outreach Activities

|   |                   |
|---|-------------------|
| UVA Math Circle, Mentor   | Aug 2023-present  |
| AWM Mentor Network, Mentor  | Apr 2020-Dec 2024 |
| SciREN Lesson Planning Workshop and Networking Event,<br>Lesson Plan Designer | Jan-Feb 2021      |
| UGA STEMzone, Booth Developer and Volunteer                                   | Nov 2018          |
| UGA MathCamp, Organizer and Graduate Student Leader                           | Jul 2018          |
| Project MEGSSS, Alumni Speaker  | May 2018          |
| Athens Area Girls Math Team, Coach  | Aug 2016-May 2017 |

### Service Activities

|   |                      |
|---|----------------------|
| UVA DEI Small Grant Activities, Co-PI and Organizer   | Jul 2023-present     |
| <i>Structuring and recruiting organizers for grant-funded departmental activities, including:<br/>peer mentoring network and various workshops and seminars for graduate students,<br/>qualifying exam study sessions, AWM colloquia, and AWM volunteering initiatives.</i> |                      |
| UVA Math Graduate Website Workshop, Leader  | Apr 2025             |
| AWM/MfA Essay Contest, Judge  | Feb 2023, Feb 2025   |
| UVA Topology REU Inkscape Workshop, Leader  | Jul 2024             |
| UGA Math Navigating Graduate School Workshop, Panel Member  | Mar 2022             |
| UGA Math Graduate Orientation, Problem Session Leader   | Aug 2021             |
| UGA Math Graduate Orientation, Peer Mentor  | Aug 2020-Jul 2021    |
| UGA VP for Research Search, Graduate Student Representative   | May 2021             |
| UGA Math Graduate Visitation Day, Panel Member  | Mar 2017, 2018, 2021 |
| AWM 50 <sup>th</sup> Anniversary Volume, Reviewer   | Aug 2020             |
| UGA Math Graduate Talk Workshop, Panel Member   | Jul 2020             |
| UGA Student Chapter of the AMS, President   | Aug 2017-Jul 2019    |
| UGA Chapter of the AWM, Secretary   | Aug 2016-Jul 2019    |
| Nebraska Conference for Undergraduate Women in Mathematics,<br>Graduate Student Panel Member  | Jan 2019             |
| UGA High School Math Tournament, Volunteer  | Oct 2016, 2017, 2018 |
| Wake/Davidson Experience in Number Theory Research (REU), Panel Member  | Jul 2016, 2017       |

### Conference & Seminar Organization

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|--|--------------------|
| Virginia Topology Conference, Organizer  | Dec 2025           |
| Joint Mathematics Meeting, Special Session Organizer   | Jan 2024           |
| <i>AMS-AWM Special Session for Women and Gender Minorities in Symplectic and Contact<br/>Geometry and Topology</i> |                    |
| MPIM Low-Dimensional Topology Seminar, Organizer   | Jan-Jul 2023       |
| Nearly Carbon Neutral Geometric Topology Conference, Session Organizer   | Jun 2021           |
| Graduate Online Anything Topology Series, Organizer  | Apr, Jun, Jul 2020 |

## **Selected Conferences, Workshops, Summer Schools** (full list on website)

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|   |              |
|---|--------------|
| Illustrating Mathematics: Reunion/Expansion (at ICERM), Providence, RI                      | Aug 2025     |
| Georgia International Topology Conference, Athens, GA                                       | May 2025     |
| Knots in Washington 50, Washington D.C.   | Dec 2024     |
| Critical Issues in Mathematics Education (at MSRI), online                                  | Mar 2023     |
| SYNC (SYmplectic N Contact topology) Early Career Workshop, Davis, CA                       | Aug 2022     |
| Trisections Working Group at the University of Central Florida, Orlando, FL                 | Jun 2022     |
| AIM 4-Dimensional Topology Research Community, online                                       | Feb-Aug 2021 |
| PCMI Graduate Summer School: Illustrating Mathematics, online                               | Jul 2021     |
| paraDIGMS (Diversity in Graduate Mathematical Sciences), online                             | Apr 2021     |
| Winter Braids X, Pisa, Italy  | Feb 2020     |
| Symplectic Geometry, Contact Geometry and Interactions (CAST), Antwerp, Belgium             | Feb 2020     |
| Women in Symplectic and Contact Geometry and Topology (at ICERM), Providence, RI            | Jul 2019     |
| PCMI Graduate Summer School: Quantum Field Theory and Manifold Invariants,<br>Park City, UT | Jul 2019     |
| Topology Students Workshop, Atlanta, GA   | Jun 2018     |
| Critical Issues in Mathematics Education (at MSRI), Berkeley, CA                            | Feb 2018     |
| Wake/Davidson Experience in Number Theory Research (REU), Winston-Salem, NC                 | Jun-Aug 2015 |
| Nebraska Conference for Undergraduate Women in Mathematics, Lincoln, NE                     | Jan 2015     |
| Carleton College Summer Mathematics Program for Women, Northfield, MN                       | Jun-Jul 2014 |

## **Professional Memberships**

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|--------------------------------------|--------------|
| Mathematical Association of America  | 2025-present |
| American Mathematical Society        | 2016-present |
| Association for Women in Mathematics | 2015-present |