

# Sarah E. Blackwell

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## 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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<b>NSF Postdoctoral Fellow and Instructor</b> , University of Virginia, Charlottesville, VA	Aug 2023-Jul 2026
• Mentor: Slava Krushkal	
<b>Postdoctoral Fellow</b> , Max Planck Institute for Mathematics, Bonn, Germany	Sep 2022-Jul 2023
• Mentor: Arunima Ray	

## Education

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<b>Ph.D. in Mathematics</b> , University of Georgia, Athens, GA	Aug 2016-Aug 2022
• Advisor: David Gay	
• Max Planck Institute for Mathematics (guest program)	Oct 2019-May 2020
• Graduate Certificate in Mathematics Education	
<b>M.A. in Mathematics</b> , University of Georgia, Athens, GA	May 2018
<b>B.A. in Mathematics</b> , 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), National Science Foundation	2023-2026
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), University of Georgia	2022
Outstanding Teaching Assistant Award, University of Georgia	2021

Oden-Beder Prize (for the Elevating Mathematics video competition), National Academy of Sciences	2020
Collins Award (given to one graduating student in each department of the 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 Leverson, Maÿlis 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 <i>Special Session on Recent Advances in Contact and Symplectic Topology</i>	Mar 2026
Joint Mathematics Meeting, Washington D.C. <i>AMS Special Session on Surfaces in 3- and 4-manifolds: Theory and Computation</i>	Jan 2026
Trisections and Related Topics (at CIRM), Marseille, France	Oct 2025
Trisectors Workshop (↗), Austin, TX	Jun 2025
AWM Research Symposium, Madison, WI <i>Women and Gender Minorities in Symplectic and Contact Geometry and Topology (WISCons) in Madison</i>	May 2025
Joint Mathematics Meeting, Seattle, WA <i>AMS Special Session on Heegaard Splittings of 3-manifolds and Trisections of 4-manifolds</i>	Jan 2025
Trisectors Workshop, Lincoln, NE	Jun 2024
Trisectors Workshop, Davis, CA <i>Pre-workshop mini-course</i>	Jun 2023
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 <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>	Apr 2022
Graduate Student Topology and Geometry Conference, Atlanta, GA	Apr 2022
Spring Topology and Dynamical Systems Conference, Waco, TX <i>Special Session in Geometric Topology</i>	Mar 2022
AMS Southeastern Sectional Meeting, online <i>Special Session on Low Dimensional Symplectic and Contact Topology, Their Invariants and Interactions</i>	Nov 2021
AMS Central Sectional Meeting, online <i>Special Session on Geometric Topology</i>	Oct 2021
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

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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 and Categorification (QTCat)	Jul 2023
University of Georgia Topology Seminar	Nov 2022
University of Virginia Geometry Seminar	May 2022
Virtual Trisection 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 Trisection 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

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, 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, 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

University of Memphis PhD Student, Mentor <i>Ongoing mentorship; resulting preprint [10] currently in preparation.</i>	Fall 2023-present
UVA Topology REU, Project Leader (with Ryan Stees) <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

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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, 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: peer mentoring network and various workshops and seminars for graduate students, 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, 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**

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 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, 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