Sarah E. Blackwell

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Research Interests

Broadly: low-dimensional topology, symplectic and contact geometry, knot theory.
Specifically: trisections of 4-manifolds, knotted surfaces, Lagrangian cobordisms between Legendrians.

Employment

Assistant Professor, California Polytechnic State University, San Luis Obispo, CA — Aug 2026-present
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

Research Visits

Institute for Pure & Applied Mathematics, long program "Quantum Topology, Character Varieties and Low-Dimensional Geometry," Los Angeles, CA — Sep 2026-Dec 2026
Max Planck Institute for Mathematics, guest program, Bonn, Germany — Oct 2019-May 2020

Education

Ph.D. in Mathematics, University of Georgia, Athens, GA — Aug 2016-Aug 2022
- Advisor: David Gay
- Graduate Certificate in Mathematics Education

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

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

Updated: October 2026

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)

[11] "Bridge position of 3-manifolds embedded in the 5-sphere" (with Román Aranda, Geunyoung Kim, Patrick Naylor, Puttipong Pongtanapaisan). Submitted.
[10] "Cornered skein lasagna theory" (with Slava Krushkal and Yangxiao Luo). Submitted.
[9] "Classical invariants of spiral knots" (with Ashish Das*, Sydney Mayer*, Luke Moyar*, Faisal Leo Quraishi*, Ryan Stees). Accepted for publication in the *Journal of Knot Theory and Its Ramifications*.
[8] "Pants distances of knotted surfaces in 4-manifolds" (with Román Aranda, Devashi Gulati, Homayun Karimi, Geunyoung Kim, Nicholas Paul Meyer, Puttipong Pongtanapaisan). Accepted for publication in *Mathematical Research Letters*.
[7] "Danceability, A New Definition of Bridge Index" (with Sol Addison, Puttipong Pongtanapaisan, Nancy Scherich, Lila Snodgrass, Everett Sullivan). In: *Topology and its Applications* 390 (2026), pp. 109897.
[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

[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, 2nd 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)

Conference Talks

Joint Mathematics Meeting, Chicago, IL — Jan 2027
AWM Special Session on Recent Developments in Symplectic and Contact Geometry and Topology by WiSCon
Workshop III: Categorification in Quantum Topology (at IPAM), Los Angeles, CA — Nov 2026
Trisectors Workshop, Bellingham, WA — Jul 2026
PCMI Undergraduate Faculty Program (two talks), Park City, UT — Jul 2026
AMS Southeastern Sectional Meeting, Savannah, GA — Mar 2026
Special Session on Recent Advances in Contact and Symplectic Topology
Joint Mathematics Meeting, Washington D.C. — Jan 2026
AMS Special Session on Surfaces in 3- and 4-manifolds: Theory and Computation
Trisections and Related Topics (at CIRM), Marseille, France — Oct 2025
Illustrating Mathematics: Reunion/Expansion (at ICERM) (↗), Providence, RI — Aug 2025
Trisectors Workshop (↗), Austin, TX — Jun 2025
AWM Research Symposium, Madison, WI — May 2025
Women and Gender Minorities in Symplectic and Contact Geometry and Topology (WISCons) in Madison
Joint Mathematics Meeting, Seattle, WA — Jan 2025
AMS Special Session on Heegaard Splittings of 3-manifolds and Trisections of 4-manifolds
Trisectors Workshop, Lincoln, NE — Jun 2024
Trisectors Workshop, Davis, CA — Jun 2023
Pre-workshop mini-course
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
AWM Special Session on Women and Gender Minorities in Symplectic and Contact Geometry and Topology
AMS Special Session on Knots, Links, 3-manifolds,... and 4-manifolds

Graduate Student Topology and Geometry Conference, Atlanta, GA — Apr 2022
Spring Topology and Dynamical Systems Conference, Waco, TX — Mar 2022
Special Session in Geometric Topology
AMS Southeastern Sectional Meeting, online — Nov 2021
Special Session on Low Dimensional Symplectic and Contact Topology, Their Invariants and Interactions
AMS Central Sectional Meeting, online — Oct 2021
Special Session on Geometric Topology
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

University of Texas at Austin Topology Seminar — Dec 2026
Caltech Geometry & Topology Seminar — Nov 2026
Virginia Tech Geometry & Topology Seminar — Apr 2026
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 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

Courses Taught

Introduction to Geometry (MATH 5700), University of Virginia — Spring 2025, 2026
Elementary Linear Algebra (MATH 3351), University of Virginia — Fall 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
Digital Accessibility Workshop, University of Virginia — Spring 2026
STEM (Teaching) Symposium, University of Virginia — Fall 2024
MATH Summer Teaching Workshop Keynote, University of Virginia — Fall 2024
Certificate in Diversity and Inclusion, University of Georgia — earned 2022
MALT (Mathematics Learning and Teaching) Seminar, University of Georgia — 2016-2022

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

Undergraduate & Graduate Mentoring

University of Memphis PhD Student, Mentor	Fall 2023-present
Ongoing mentorship; resulting preprint currently in preparation.	
Park City Mathematics Institute Experimental Math Lab (XML), Leader	Summer 2026
UVA Topology REU, Project Leader (with Ryan Stees)	Summer 2024
Resulted in a preprint [8] and student presentation at JMM 2025.	
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-Apr 2026
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

Park City Mathematics Institute, Career Panel Member	Jul 2026
UVA DEI Small Grant Activities, Co-PI and Organizer	Jul 2024-Jun 2026
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.	
Moab Topology Conference, Career Panel Member	May 2026
UVA (High School) Math Tournament, Panel Member	Mar 2026
AWM/MfA Essay Contest, Judge	Feb 2023, 2025, 2026
UVA Math Graduate Website Workshop, Leader	Apr 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 50th 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

Joint Mathematics Meeting, Special Session Organizer *AMS Special Session on Splittings in Low-Dimensional Topology*	Jan 2027
Virginia Topology Conference, Organizer	Dec 2025
Joint Mathematics Meeting, Special Session Organizer *AMS-AWM Special Session for Women and Gender Minorities in Symplectic and Contact Geometry and Topology*	Jan 2024
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

Referee Work

Forum Mathematicum
Michigan Mathematical Journal
Transactions of the London Mathematical Society

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

Research Collaboration Workshop in Contact and Symplectic Geometry/Topology (at IPAM), Los Angeles, CA	Aug 2026
PCMI Research Program: Knotted Surfaces in Four-Manifolds, Park City, UT	Jul 2026
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

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